



Canada Lynx Conservation Assessment and Strategy

3rd Edition — August 2013



Acknowledgments

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Table of contents

| | |
|---|-----------|
| ACKNOWLEDGMENTS | i |
| Interagency Lynx Biology Team members..... | ii |
| Chapter 1– INTRODUCTION | 1 |
| Purpose and history of the Lynx Conservation Assessment and Strategy..... | 1 |
| Synopsis of major changes from the previous edition..... | 1 |
| History of ESA listing actions and relationship to the LCAS..... | 2 |
| Why the LCAS is still useful and needed | 3 |
| Guiding principles..... | 4 |
| How the document is organized | 4 |
| Chapter 2– OVERVIEW OF LYNX ECOLOGY | 6 |
| Description of lynx | 6 |
| Lynx activity patterns | 7 |
| Lynx diet..... | 9 |
| Snowshoe hare ecology..... | 10 |
| Red squirrel ecology | 18 |
| Lynx hunting behavior | 21 |
| Lynx distribution | 22 |
| States with verified records of lynx..... | 22 |
| States with verified records but not thought to support resident populations of lynx..... | 22 |
| Lynx population density and home range size | 23 |
| Description of lynx habitat | 24 |
| Lynx population dynamics..... | 30 |
| Genetic variation across the range of lynx | 34 |
| Hybridization with bobcats..... | 35 |
| Interspecific relationships with other carnivores | 35 |
| Chapter 3– LYNX GEOGRAPHIC AREAS | 37 |
| Northeast Geographic Area..... | 38 |
| Geographic extent..... | 38 |
| Lynx population status and distribution | 39 |
| Lynx habitat..... | 40 |
| Connectivity of lynx populations and habitats..... | 42 |
| Snowshoe hare population distribution and habitat..... | 42 |
| Human activities and developments in the Northeast..... | 43 |
| Great Lakes Geographic Area | 43 |
| Geographic extent..... | 43 |
| Lynx population status and distribution | 44 |
| Lynx habitat..... | 45 |
| Connectivity of lynx populations and habitats..... | 47 |
| Snowshoe hare population distribution and habitat..... | 47 |
| Human activities and developments in the Great Lakes | 48 |
| Southern Rocky Mountains Geographic Area..... | 50 |
| Geographic extent..... | 50 |
| Lynx population status and distribution | 50 |
| Lynx habitat..... | 52 |

| | |
|---|-----------|
| Connectivity of lynx populations and habitats..... | 53 |
| Snowshoe hare population distribution and habitat..... | 54 |
| Human activities in the Southern Rockies..... | 55 |
| Northern Rocky Mountain Geographic Area | 56 |
| Geographic extent..... | 56 |
| Lynx population status and distribution | 57 |
| Lynx habitat..... | 59 |
| Connectivity of lynx populations and habitats..... | 60 |
| Snowshoe hare population distribution and habitat..... | 61 |
| Human activities and developments in the Northern Rockies..... | 62 |
| Cascade Mountains Geographic Area..... | 63 |
| Geographic extent..... | 63 |
| Lynx population status and distribution | 64 |
| Lynx habitat..... | 64 |
| Connectivity of lynx populations and habitats..... | 65 |
| Snowshoe hare population distribution and habitat..... | 66 |
| Human activities in the Cascades..... | 66 |
| Chapter 4– ANTHROPOGENIC INFLUENCES ON LYNX AND LYNX HABITAT | 68 |
| First tier of anthropogenic influences..... | 69 |
| Climate change..... | 69 |
| Vegetation management..... | 71 |
| Wildland fire management..... | 75 |
| Fragmentation of habitat..... | 76 |
| Second tier of anthropogenic influences | 78 |
| Incidental trapping | 79 |
| Recreation | 80 |
| Minerals and energy exploration and development | 83 |
| Illegal shooting..... | 84 |
| Forest/backcountry roads and trails..... | 84 |
| Grazing by domestic livestock..... | 85 |
| Chapter 5– CONSERVATION STRATEGY | 86 |
| Approach to development of conservation measures..... | 86 |
| Lynx Analysis Units..... | 86 |
| Core areas and secondary/peripheral areas..... | 87 |
| Relationship of the LCAS to land management plans..... | 88 |
| Relationship to designated critical habitat..... | 89 |
| Core areas: conservation measures | 89 |
| First tier of anthropogenic influences | 90 |
| Second tier of anthropogenic influences..... | 94 |
| Secondary/peripheral areas: conservation measures..... | 96 |
| Chapter 6– INVENTORY, MONITORING, AND RESEARCH..... | 97 |
| Inventory | 97 |
| Monitoring | 97 |
| Research needs..... | 98 |
| LITERATURE CITED..... | 99 |
| GLOSSARY | 123 |

Chapter I - INTRODUCTION

Purpose and history of the Lynx Conservation Assessment and Strategy

The Lynx Conservation Assessment and Strategy (LCAS) was developed to provide a consistent and effective approach to conserve Canada lynx (*Lynx canadensis*), hereafter referred to as lynx, and to assist with Section 7 consultation under the Endangered Species Act (ESA) on federal lands in the contiguous United States. An action plan that identified the need for preparation of a lynx conservation strategy was approved by the affected Regional Foresters of the USDA Forest Service (FS), State Directors of the Bureau of Land Management (BLM), and Regional Directors of the U. S. Fish and Wildlife Service (FWS) on June 5, 1998. The National Park Service (NPS) joined the effort later that month.

In accordance with the action plan, an interagency Steering Committee was established to guide lynx conservation efforts. The Steering Committee selected a Science Team, led by Dr. Leonard Ruggiero, FS-Rocky Mountain Research Station, to assemble the best available scientific information on lynx, and appointed a Lynx Biology Team, led by Bill Ruediger, FS-Northern Region, to prepare a lynx conservation strategy applicable to federal land management in the contiguous United States.

The first edition of the LCAS was completed in January, 2000, with the second edition issued in August, 2000. Several amendments and clarifications were subsequently issued through the Steering Committee.

The LCAS is designed for application on federal lands. However, the information, concepts, and conservation measures could also be applied if desired when planning and managing lynx habitat on non-federal lands.

Synopsis of major changes from the previous edition

This edition of the LCAS provides a full revision, incorporating all prior amendments and clarifications, substantial new scientific information that has emerged since 2000 including related parts of the Lynx Recovery Plan Outline, as well as drawing on experience gained in implementing the 2000 LCAS. The document has been reorganized and condensed to improve readability and reduce redundancy.

Chapter 3, Lynx Geographic Areas, has been substantially revised to incorporate new information about lynx and lynx habitat. The map (Fig. 3.1) has also been updated.

Chapter 4, formerly titled Risk Factors, is here retitled as Anthropogenic Influences on Lynx and Lynx Habitat. The anthropogenic influences are grouped into 2 tiers based on the potential magnitude of effects on lynx and their habitats. For each anthropogenic influence, there is an explanation of how it may influence key drivers of lynx population dynamics: the snowshoe hare (*Lepus americanus*) prey base, direct mortality of lynx, and the risks associated with small population size.

The chapters that formerly described Planning Area and Project Level were eliminated in this edition. The original intent was to provide the perspective of a multi-tier spatial hierarchy in discussing status, trends, and concerns relative to lynx and lynx habitat. In retrospect, however, these 2 chapters were redundant to material already presented in the previous chapters.

Chapter 5, Conservation Strategy, incorporates concepts from the Canada Lynx Recovery Outline (U.S. Fish and Wildlife Service 2005). Specifically, conservation efforts for lynx are not to be applied equally across the range of the species, but instead more focus is given to high priority areas: the core areas. Further, we combined secondary areas and peripheral areas (which were also identified in the recovery outline) into one category, because they have similar characteristics and management recommendations. The intent is to place more emphasis on protection of the core areas, which support persistent lynx populations and have evidence of recent reproduction, and less stringent protection and greater flexibility in secondary/peripheral areas, which only support lynx intermittently. Chapter 5 presents conservation measures only for those anthropogenic influences that are within the authority of the federal agencies, and identifies areas where they should be applied.

Guidance provided in the revised LCAS is no longer written in the framework of objectives, standards, and guidelines as used in land management planning, but rather as conservation measures. This change was made to more clearly distinguish between the management direction that has been established through the public planning and decision-making process, versus conservation measures that are meant to synthesize and interpret evolving scientific information.

History of ESA listing actions and relationship to the LCAS

The FWS published a proposed rule on July 8, 1998 to list the lynx under the ESA of 1973, as amended (Federal Register Volume 63, No. 130, pp. 36994–37013). On March 24, 2000, the FWS published the final rule listing the Contiguous United States Distinct Population Segment (DPS) as a threatened species (Federal Register Vol. 65, No. 58, pp. 16052–16086). In its analysis of threats to the species, the FWS concluded that the single factor threatening the DPS was the inadequacy of existing regulatory mechanisms, specifically the lack of guidance for conservation of lynx in National Forest Land and Resource Management Plans and BLM Land Use Plans. The LCAS served as the foundation for review and amendment of those plans, as needed, to provide for the conservation of lynx.

The decision to list lynx as a single DPS and as threatened (rather than endangered) was challenged and the courts remanded the decision back to the FWS. On July 3, 2003, the FWS published a Notice of Remanded Determination of Status for the Contiguous United States Distinct Population Segment of the Canada Lynx (Federal Register Vol. 68, No. 28, pp. 40076–40101). In its finding (here referred to as the Remanded Rule), the FWS again evaluated the threats to lynx and reaffirmed its previous conclusion that endangered status was not warranted. The FWS indicated that many activities that may affect the lynx and its habitat have only local effects, which can vary depending on the quality and quantity of habitat available. The relative importance of each threat was also described for each geographic area. In the Remanded Rule, the FWS discussed the periodic immigration of lynx from Canada and its possible role in sustaining the smaller populations of lynx in the contiguous United States. These new understandings were incorporated into agency planning and management where appropriate.

A Recovery Outline for the Contiguous United States DPS of Canada Lynx (U.S. Fish and Wildlife Service 2005) was prepared by the FWS and made available on Sept. 14, 2005. A recovery outline is intended to provide interim guidance for consultation and recovery efforts until a formal recovery plan has been approved. No recovery plan has yet been developed for the lynx. This revision of the LCAS considered, incorporated, and in some cases modified or elaborated on the concepts that were put forward in the 2005 recovery outline.

Under the recovery outline, lynx habitat was stratified into core, secondary, and peripheral areas based on lynx occupancy, reproduction, and use as documented by historical and current records. The recovery outline did not establish recovery goals, but did identify a preliminary set of objectives and potential recovery actions for each area.

Core areas were identified by FWS where there was strong evidence of long-term persistence of lynx populations, including both historical records of lynx occurrence over time, and recent (within the past 20 years) evidence of presence and reproduction. A core area contains large, connected patches of boreal forest, encompassing at least 1,250 km² (480 mi²). The term boreal forest is used here to include the true boreal forest, which is a zone extending south of the arctic tundra, as well as the southern transitional regions as described by Agee (2000) for the northeastern and Great Lakes regions (eastern hardwoods and temperate and boreal conifers) and the western United States (subalpine forests).

Secondary areas were identified by FWS where there were historical records of lynx presence, but fewer than in core areas, and no recent documentation of presence or reproduction; or where there were historical records of lynx, but current status is unknown due to lack of recent surveys.

Peripheral areas were identified by FWS where there were sporadic historical records of lynx, which generally correspond to cyclic population highs in Canada, and there was no evidence of reproduction. Because boreal forest in peripheral areas occurs in small and more isolated patches (such as an isolated mountain range), these areas are considered to be incapable of supporting self-sustaining populations of lynx.

Critical habitat for the lynx was designated on November 9, 2006 (Federal Register Vol. 71, No. 217, pp. 66008–66061). On July 20, 2007, the FWS announced that the final critical habitat rule would be reviewed in light of questions that had been raised about the integrity of the decision-making process. Based on this review, the FWS concluded that the final rule was improperly influenced by the then-Deputy Assistant Secretary of the Interior. On January 15, 2008, the U. S. District Court for the District of Columbia issued an order establishing deadlines for reissuing the critical habitat rule. The revised final rule designating critical habitat was published in the Federal Register, Vol. 74, No. 36, pp. 8616–8702 on February 25, 2009. Approximately 101,010 km² (39,000 mi²) distributed in 5 units within the states of Maine, Minnesota, Montana, Wyoming, Idaho, and Washington were encompassed within the boundaries of the revised critical habitat. In July and September of 2010, the District Courts in Montana and Wyoming, respectively, took exception to parts of the revised critical habitat designation and again remanded the rule to the FWS. A proposed revised rule is scheduled for publication in September 2013 and a final rule within the following 12 months. The 2009 final rule will remain in effect until completion of the remanded critical habitat designation.

In this revision of the LCAS, the discussion of geographic areas and the development of conservation measures were informed by the Remanded Rule, the Recovery Outline, the revised final critical habitat rule, and other information that has become available since 2000.

Why the LCAS is still useful and needed

In response to the listing decision in 2000, the FS and the BLM entered into conservation agreements with the FWS. In these agreements, the agencies acknowledged the LCAS as one of the sources of the best available scientific information to assist in conservation of lynx. The agreements were to remain in place until such time as forest plans and land use plans could be amended or revised to incorporate management direction specific to conservation of lynx.

When the first edition of the LCAS was written, most lynx research had been conducted in Alaska and Canada, and little published literature was available regarding lynx in the contiguous United States (Ruediger et al. 2000). Since then, new research has been conducted throughout the range of the lynx and the body of scientific literature has expanded substantially. This revised LCAS provides an updated synthesis of the best available scientific infor-

mation about lynx ecology and responses to management.

The LCAS continues to fulfill important roles in promoting conservation of the species on federal lands, particularly in the absence of an approved recovery plan, and in assisting biologists in supporting their determinations of effect and conducting ESA Section 7 consultation. In recognition of these ongoing roles, a revision of the LCAS was initiated in September, 2010. At the request of the Steering Committee, Dr. John Squires, FS-Rocky Mountain Research Station, led a review of the research and published scientific literature produced since 2000, and provided the Lynx Biology Team with a draft update of the assessment portion of the LCAS. The Lynx Biology Team built on that work to complete this revision of the LCAS.

Forest plans are prepared and implemented in accordance with the National Forest Management Act of 1976. Amendments or revisions to FS plans have been completed in the Eastern Region, Northern Region, Rocky Mountain Region, and Intermountain Region to better address conservation of the lynx. In the Pacific Northwest Region, forest plans for national forests with lynx habitat are currently being revised. The management direction contained in a forest plan guides project development and must be followed. The updated information and understandings in the revised LCAS may be useful for project planning and implementation, as well as helping to inform future amendments or revisions of forest plans.

The BLM and NPS continue to rely on the LCAS along with other sources of information to guide management of lynx habitat. The updated LCAS will assist these agencies in planning and designing their programs and projects.

Guiding principles

We relied on these guiding principles in developing and revising the LCAS:

- **Use the best scientific information available about lynx.** We relied on information from research throughout the range of the species, recognizing that behavior and habitat use may differ in various portions of its range. We incorporated information about the ecology of its primary prey species, snowshoe hare, and an alternate prey species, red squirrel (*Tamiasciurus hudsonicus*). As the basis for management recommendations, we relied primarily upon peer-reviewed publications. If no published sources were available on a given topic, we considered information from theses, dissertations, or other unpublished sources.
- **Address conflicting information.** In a few cases, different authors reached different or even opposing conclusions about a particular topic. In these situations we considered all the available information, assessed the rigor of the methods used in each study, and provided the rationale for the conclusions we reached.
- **Integrate a consideration of natural ecological processes and landscape patterns with knowledge of lynx habitat requirements.** Integrating knowledge about broad ecological processes and species-specific requirements is more likely to result in a strategy that is feasible to implement and sustainable over the long term.

How the document is organized

Chapters 2–4 of the document constitute the conservation assessment. These chapters provide a review and synthesis of the scientific foundation for the conservation of lynx. An overview of lynx ecology is presented in Chapter 2, followed by an assessment of lynx population status and habitat conditions for each of the geographic areas: Northeast, Great Lakes, Southern Rocky Mountains, Northern Rocky Mountains, and Cascade Mountains. Next we describe and prioritize the anthropogenic influences that may affect lynx or lynx habitat.

Based on the foundation of the conservation assessment, Chapter 5 presents the conservation strategy for lynx. The conservation measures contained in the strategy are compatible with the concepts and potential recovery actions put forward in the recovery outline (U.S. Fish and Wildlife Service 2005).

Chapter 6 summarizes information gained from past inventories and discusses the needs and priorities for future inventory of lynx populations and habitat. This chapter also describes important needs for future monitoring and research. Monitoring and applied research are essential to continue to adapt and improve management approaches that support lynx conservation.

Chapter 2 - OVERVIEW OF LYNX ECOLOGY

Description of lynx

Canada lynx are medium-sized cats, 75–90 cm (30–35 in) long and weighing 6–14 kg (13–31 lb; Quinn and Parker 1987, Moen et al. 2010a). They have large feet (Plate 2.1) adapted to walking on snow, long legs, tufts on the ears, and black-tipped tails (Plate 2.2).



Jeremy Anderson, USDA Forest Service.

Plate 2.1. Lynx have large furry feet, an adaptation for travel through deep, fluffy snow.



Jeff Heinlen, WA Department of Fish and Wildlife



Northern Rockies Lynx Project, Rocky Mountain Research Station, USDA Forest Service.

Plate 2.2. Canada lynx characteristics include a ruffed face, ear tufts, black-tipped tail, long legs, and large feet.

Lynx activity patterns

Circadian activity pattern. Kolbe and Squires (2007) reported on lynx activity patterns in Montana. Periods of activity varied by sex, season, and reproductive status, and were not consistently synchronous with the activity patterns of snowshoe hares. In winter, males were most active during daylight hours, with peaks in the afternoon or early evening; in summer, males tended to be more crepuscular in their activities. In contrast, female lynx that were rearing kittens during the summer months were most active during daylight hours, when the mean ambient temperature was highest. One female lynx without kittens had crepuscular patterns of activity similar to those of male lynx during summer.

Daily movements. Daily movements of lynx within their home ranges are centered on continuous forest, and they frequently use ridges, saddles, and riparian areas (Koehler 1990a, Staples 1995). Snow-tracking revealed that lynx avoid large openings (Staples 1995, Squires et al. 2010), either natural (Koehler 1990a) or created (Maletzke et al. 2008) when moving through their home ranges.

Fuller and Harrison (2010) found that daily movement distances of lynx in Maine varied by gender, season, and in relation to prey. The movement paths of female lynx raising kittens had higher sinuosity, apparently reflecting a preference to remain in habitats with dense horizontal cover and good accessibility to prey. In contrast, males appeared to make more linear movements, and tended to use skid trails and areas with less dense understory more frequently than females (Fuller and Harrison 2010).

In Minnesota, 3 female lynx used a foraging radius of approximately 2–3 km (1.2–1.8 mi) when kittens were at the den (Moen et al. 2008). In contrast, >50% of GPS collar locations were >2 km away from the den site during pre-denning and post-denning periods. Net displacement rates of 1–2 km/day (0.6–1.2 mi) were similar to rates reported from some other southern lynx populations (Apps 2000, Squires and Laurion 2000).

Squires et al. (2013) used global positioning system (GPS) collars programmed to record locations every 30 minutes every other day for 33 individual lynx during winter and 28 lynx during summer; the average daily movement rate of those lynx in Montana was 6.9 km/day (4.2 mi/day). Olson et al. (2011) monitored 4 denning females in Montana and reported that daily distances moved were shorter during the period from parturition until the kittens were 2 months old, as compared to movement distances before the kittens were born.

Ward and Krebs (1985), using VHF radio telemetry (to calculate the straight-line distance between locations on consecutive days) in southwestern Yukon, documented an increase in the radius of lynx daily movements as snowshoe hare densities decreased. Straight-line daily travel distance remained constant at about 2.2–2.7 km/day (1.3–1.6 mi/day) at hare densities above 1.0 hare/ha (0.4 hares/ac). Below 1.0 hare/ha (0.4 hares/ac), straight-line daily travel distances increased rapidly, reaching 5.5 km/day (3.3 mi/day) at 0.2 hares/ha (0.08 hares/ac). Below about 0.5 hares/ha (0.2 hare/ac), several lynx abandoned their home ranges and became nomadic, although they remained within the general study area. Parker et al. (1983) used VHF radio telemetry to relocate 1 adult female and reported the female's daily movement distance as 8.8 km (5.3 mi) in winter and 10 km (6.2 mi) in summer.

Exploratory movements. Aubry et al. (2000) defined exploratory movements as long-distance movements beyond identified home range boundaries, in which the animal returned to its original home range. Exploratory movements by lynx have been documented to occur within most of the geographic areas.

In Maine, lynx made long distance movements throughout the year from a study area in northwestern Maine,

often returning to reoccupy their home range (Vashon et al. 2012). Distances of 52–403 km (31–242 mi) were recorded for movements into Quebec, and distances of 142–227 km (85–136 mi) were recorded for movements within the state of Maine.

In Minnesota, Moen et al. (2010b) reported lynx making long distance movements at all times of the year. Exploratory movements were greatest for males during the breeding season in March (Burdett et al. 2007). Resident lynx made long distance movements lasting days to a few months into Ontario and back during the pre-denning period.

In Montana, Wyoming, and southern British Columbia, exploratory movements by resident lynx during the summer months were documented by Squires and Laurion (2000), Squires and Oakleaf (2005), and Apps (2000), respectively. Distances of these exploratory movements in Montana ranged from about 15–40 km (9–25 mi), and duration away from the home range was 1 week to several months (Squires and Laurion 2000). In Wyoming, during 3 consecutive summers, a resident lynx was documented to travel a similar exploratory path (minimum path distance of 728 km [452 mi]) from its home range in the Wyoming Range, to the Wind River and Teton Ranges, and back (Squires and Oakleaf 2005).

Summer exploratory movements were not detected in north-central Washington (Koehler 1990a), nor have exploratory movements been recorded in the northern boreal forest (Mowat et al. 2000). It is unclear whether such movements did not occur, or were simply not observed due to the methods and frequency of monitoring employed in these studies.

Dispersal. Dispersal is the permanent movement of an animal to a new home range. Animals that are dispersing often cross areas such as frozen lakes, deserts, and farmland that are not typical lynx habitat (Ward and Krebs 1985). Mortality of dispersing lynx is speculated to be high, particularly for those individuals moving long distances through areas that lack adequate lynx habitat or resident populations (McKelvey et al. 2000b). However, this speculation is based primarily on trapping mortality information, rather than a study of the known fates of marked animals. Therefore, the extent to which dispersing lynx are able to successfully colonize new habitat is largely unknown.

It has been reported that female lynx tend to establish home ranges adjacent to their mother (Mowat and Slough 1998), while young males are more likely to disperse. However, an analysis of fine-scale genetic structure of lynx populations in Alberta, Canada suggested that dispersal distances did not significantly differ between males and females (Campbell and Strobeck 2006).

Dispersal distances of up to 1,000 km (620 mi) have been recorded for lynx (Mech 1980, Slough and Mowat 1996, Poole 1997). During dispersal, the minimum daily travel rate of 3 individual lynx was 1.7–8.3 km (1–5 mi) per day (Ward and Krebs 1985). Dispersing lynx did not appear to travel farther per day than resident lynx, but most movement was directional (Mowat et al. 2000).

In Canada, adult and subadult lynx of both sexes were documented making long-distance movements during periods of prey scarcity (Slough and Mowat 1996, Poole 1997). During the cyclic low of hare numbers in the Yukon, rates of emigration from established home ranges increased (O'Donoghue et al. 2001). Many of the lynx that were translocated to Colorado also made extensive movements (Devineau et al. 2010).

Lynx diet

Snowshoe hares (Plate 2.3) are the primary prey of lynx throughout their range (Mowat et al. 2000).



Plate 2.3. Across the range of lynx, snowshoe hares are the primary prey. The color of the fur changes seasonally, from white in winter to brown in summer.

It is thought that the summer diet of lynx may include a greater diversity of prey species than in winter, due to the greater seasonal availability of prey (Quinn and Parker 1987, Koehler and Aubry 1994, Mowat et al. 2000). The summer diet of lynx has not been quantified in the southern portion of its range, although some anecdotal information is available.

Red squirrels (Plate 2.4) are reported to be the second most important food source for lynx in Alaska (Staples 1995) and the main alternate prey of lynx during periods of low hare abundance in Yukon Territory (O'Donoghue 1997). Other prey species taken across the range of the lynx include grouse (*Bonasa umbellus*, *Dendragopus* spp., *Lagopus* spp.), northern flying squirrel (*Glaucomys sabrinus*), ground squirrels (*Spermophilus parryii*, *S. richardsonii*, *Urocyon columbianus*), porcupine (*Erethizon dorsatum*), beaver (*Castor canadensis*), mice (*Peromyscus* spp.), voles (*Microtus* spp.), shrews (*Sorex* spp.), weasels (*Mustela* spp.), fish, and ungulates as carrion (Saunders 1963a, van Zyll de Jong 1966, Nellis et al. 1972, Brand et al. 1976, Brand and Keith 1979, Koehler 1990a, Staples 1995, O'Donoghue et al. 1998, Olson et al. 2011). Male lynx have opportunistically killed white-tailed deer (*Odocoileus virginianus*) and mule deer (*Odocoileus hemionus*) in the southern extent of their range, when deep snow hindered deer movements and increased their vulnerability to predation (Fuller 2004, Poszig et al. 2004, Squires and Ruggiero 2007).



Plate 2.4. Red squirrels are an important secondary prey for lynx in some parts of its range.

Description. Snowshoe hares generally average 40–44 cm (15.7–17.3 in) in length and 0.9–1.7 kg (2–3.7 lb) in weight (Kays and Wilson 2002). They have large hind feet and their pelage changes seasonally, from brown in summer to white in winter (Severaid 1945).

Snowshoe hares are widely distributed across North America, and are broadly associated with boreal and subalpine forests (Hall 1981). The species' historical range in North America extends from Alaska across most of Canada, and southward into portions of the contiguous United States. This includes the Cascades and Sierra Nevada Mountains (reaching into central California), the Rocky Mountains (reaching into southern Utah and northern New Mexico), the Great Lakes region, and the Appalachian Mountains (into North Carolina and Tennessee; Hodges 2000b, Hoffman and Smith 2005).

Activity patterns. Snowshoe hares forage primarily at dusk and dawn, remaining largely inactive during daylight hours (Foresman and Pearson 1999, Abele 2004). Lunar phases may influence foraging activity and movement patterns as well. Hares are less active under a full moon, particularly in the winter months when snow-reflected light likely would increase their susceptibility to predation (Gilbert and Boutin 1991, Griffin et al. 2005).

Home range. Home range size is 5–10 ha (12–25 ac); estimates vary depending on the sampling method (e.g., live-trapping vs. radio telemetry; Keith 1990, Hodges 2000a, Murray 2003). Although hares are non-migratory and generally occupy the same area throughout the year, short-distance seasonal movements between winter and summer foraging areas have been documented (Adams 1959, Bookhout 1965, Wolff 1980, Wolfe et al. 1982).

Dispersal. Dispersal from home ranges may be associated with intraspecific aggression resulting from overcrowding, competition for mates and food resources, or vulnerability to predation (Keith et al. 1993, Duffy and Belthoff 2001). Cyclic populations experienced higher dispersal rates during the late increase phase and the peak (Windberg and Keith 1976, Wolff 1980). Habitats with higher amounts of cover had lower rates of dispersal than habitats with little cover (Wirsing et al. 2002), as did larger habitat patches when compared to smaller habitat patches (Keith et al. 1993).

Habitat. Snowshoe hares occur in boreal forests across North America (Hodges 2000b). The density of horizontal cover, snow conditions, and presence of boreal forest vegetation appear to be important attributes of snowshoe hare habitat (Hodges 2000a).

Horizontal cover. The amount and density of horizontal cover strongly influence snowshoe hare abundance. Dense horizontal cover likely reduces exposure to predators, the proximate cause of most mortality (>90%) observed for hares in most populations studied (Sievert and Keith 1985, Rohner and Krebs 1996, Hodges 2000a, Murray 2003). Dense horizontal cover also provides better access to food resources and thermal protection during the critical winter period (Hodges et al. 2001), making it an important element of hare habitat (Belovsky 1984, Sievert and Keith 1985, Rohner and Krebs 1996, Wirsing et al. 2002, Murray 2003). Griffin (2004) documented higher hare survival in dense stands than in open stands in Montana. Hares also were more likely to select larger patches of densely-vegetated habitats when dispersing (Keith et al. 1993, Duffy and Belthoff 2001, Griffin 2004).

Stem densities ranging from 4,600–33,210 stems/ha (1,862–13,445 stems/ac) provide optimal forage and horizontal cover for snowshoe hares (Wolff 1980, Parker 1984, Litvaitis et al. 1985, Monthey 1986, Parker 1986, Koehler 1990a, Griffin 2004, Fuller and Harrison 2005, Robinson 2006, Scott 2009). Lewis et al. (2011) found that snowshoe hare densities were higher in areas where dense, horizontal cover patches

were more contiguous or where similar patches were surrounded by other patches of similar structure.

In Maine, Fuller and Harrison (2005), Robinson (2006), Fuller et al. (2007), and Scott (2009) documented a close association between snowshoe hare density and horizontal cover density in conifer-dominated regenerating clearcuts.

In western Montana, Griffin (2004) monitored snowshoe hare densities in 4 forest stand structural stages: open mature (>150 years old and >76 cm [30 in] diameter at breast height [dbh]), open young (20–45 years old), dense mature, and dense young. During the summer (late June to mid-September), snowshoe hare densities were highest in the dense young, with the next highest hare densities in most years in the dense mature. In winter (mid-December to early April), snowshoe hare densities were highest in the dense mature (Griffin 2004).

In Wyoming, Berg et al. (2012) found hare densities (as measured by pellet counts) to be highest in young (30–70 year old) regenerating lodgepole pine (*Pinus contorta*) and mature, multi-story spruce-fir forests (Plate 2.5). While snowshoe hare density did not increase with increasing stem densities in the mature multi-story patches, hare density in the young, regenerating forests increased as stem densities increased (Berg et al. 2012). Ellsworth (2009) also highlighted the importance of young lodgepole pine stands with high sapling densities in northern Idaho.



Plate 2.5. Dense horizontal cover providing cover from predators, thermal protection, and adequate forage is required to support snowshoe hares across their range.

Snow conditions. Across northern boreal forests in Canada, conditions that favor hares are cold and dry, moderately deep (100–127 cm [39–50 in]) snow with relatively uniform depth (Kelsall et al. 1977). Studies documenting the relationship between snow depth and hare feeding patterns in Alberta (Johnstone 1981, Ives and Rentz 1993), British Columbia (Sullivan and Sullivan 1982), Colorado (Zahratka 2004), Montana

Snowshoe hare ecology

(Zimmer 2004), north-central Washington (Koehler 1990b), and northern Idaho (Wirsing and Murray 2002, Ellsworth 2009) showed that snow accumulation and persistence influence food availability, and consequently hare feeding patterns.

Boreal forest vegetation. In the northeastern United States, snowshoe hare populations occurred in all forested habitats at elevations of 0–1,800 m (0–5,500 ft). Coniferous and mixed-coniferous/deciduous forests dominated by white spruce (*Picea glauca*), black spruce (*Picea mariana*), red spruce (*Picea rubens*), balsam fir (*Abies balsamea*), eastern white pine (*Pinus strobus*), northern white cedar (*Thuja occidentalis*), eastern hemlock (*Tsuga canadensis*), sugar maple (*Acer saccharum*), aspen (*Populus tremuloides*), and paper birch (*Betula papyrifera*) were known to provide snowshoe hare habitat in this region (Hoving et al. 2004, Robinson 2006, Fuller et al. 2007, Vashon et al. 2008b, Scott 2009).

In the Great Lakes states, most snowshoe hare populations occurred in regenerating or young (25 years old or less) mixed deciduous and conifer forests (Plate 2.6; McCann and Moen 2011). Cover types in this region that support snowshoe hare include jack pine (*Pinus divaricata*), red pine (*Pinus resinosa*), balsam fir, black spruce, white spruce, northern white cedar, tamarack (*Larix laricina*), aspen, paper birch, as well as conifer bogs and shrub swamps (Burdett 2008, Moen et al. 2008).

In the western United States, most snowshoe hare populations occurred within conifer forests at elevations ranging from 645–3,415 m (2,116–11,204 ft; Dolbeer and Clark 1975, Griffin 2004, Lewis et al. 2011, Berg and Gese 2012). Cover types that support snowshoe hares in this region include Engelmann spruce (*Picea engelmannii*), subalpine fir (*Abies lasiocarpa*), mixed spruce-fir, mixed aspen and spruce-fir, and mixed lodgepole and spruce-fir and lodgepole pine (Hodges 2000b, Zahratka 2004, Zimmer 2004, Miller 2005, Berg et al. 2012).



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Plate 2.6. Forest structure that provides dense horizontal cover is a common characteristic of snowshoe hare habitat across its range, but plant species composition varies. In the Great Lakes Geographic Area, a mix of coniferous and deciduous trees provide the best snowshoe hare habitat.

Diet. Snowshoe hares feed on a variety of plant species, differing by region, plant community, and season (Hodges 2000a, 2000b; Ellsworth and Reynolds 2006; see Table 2.1). Energy expenditure and susceptibility to predation (Houston et al. 1993; Hodges and Sinclair 2003, 2005) also influence the diet.

Table 2.1. Food plants used by snowshoe hares in different regions, modified from Hodges (2000b).

| Conifers | Deciduous trees | Shrubs | References |
|--|------------------------------|--------------------------------|---|
| Eastern: Maritimes & Maine | | | |
| <i>Abies balsamea</i> | <i>Acer pennsylvanicum</i> | <i>Corylus cornuta</i> | Telfer 1972 (New Brunswick) Litvaitis 1984 (ME) |
| <i>Picea</i> spp. | <i>Acer rubrum</i> | <i>Gaylussaccia baccata</i> | |
| <i>Picea rubens</i> | <i>Acer saccharum</i> | <i>Hamamelis virginiana</i> | |
| <i>Pinus strobus</i> | <i>Acer spicatum</i> | <i>Kalmia</i> spp. | |
| <i>Thuja occidentalis</i> | <i>Alnus rugosa</i> | <i>Myrica gale</i> | |
| <i>Tsuga canadensis</i> | <i>Alnus crispa</i> | <i>Nemopanthus mucronata</i> | |
| | <i>Betula alleghaniensis</i> | <i>Rhododendron canadense</i> | |
| | <i>Betula papyrifera</i> | <i>Vaccinium</i> spp. | |
| | <i>Betula populifolia</i> | <i>Viburnum</i> spp. | |
| | <i>Comptonia peregrina</i> | | |
| | <i>Fagus grandifolia</i> | | |
| | <i>Quercus rubra</i> | | |
| Eastern: Appalachians & Alleghenies | | | |
| <i>Picea glauca</i> | <i>Acer pennsylvanicum</i> | <i>Juniperus communis</i> | Cook & Robeson 1945 (NY) Brooks 1955 (VA) Walski & Mautz 1977 (NH) Brown 1984 (PA) Rogowitz 1988 (NY) Scott & Yahner 1989 (PA) |
| <i>Picea rubens</i> | <i>Acer rubrum</i> | <i>Kalmia latifolia</i> | |
| <i>Pinus resinosa</i> | <i>Acer saccharum</i> | <i>Rhododendron lapponicum</i> | |
| <i>Pinus strobus</i> | <i>Betula alleghaniensis</i> | <i>Rubus alleghaniensis</i> | |
| <i>Pinus sylvestris</i> | <i>Betula lenta</i> | <i>Rubus hispidus</i> | |
| <i>Thuja occidentalis</i> | <i>Betula lutea</i> | <i>Vaccinium erythrocarpum</i> | |
| <i>Tsuga canadensis</i> | <i>Betula papyrifera</i> | <i>Viburnum dentatum</i> | |
| | <i>Fagus grandifolia</i> | | |
| | <i>Fraxinus americana</i> | | |
| | <i>Populus tremuloides</i> | | |
| Midwestern: Great Lakes | | | |
| <i>Abies balsamea</i> | <i>Acer pennsylvanicum</i> | <i>Amelanchier</i> spp. | Grange 1932 (WI) Bider 1961 (Quebec) de Vos 1964 (Ontario) Bookhout 1965 (MI) Johnson 1969 (MI) Conroy et al. 1979 (MI) Grigal & Moody 1980 (MN) Bergeron & Tardif 1988 (Quebec) |
| <i>Larix laricina</i> | <i>Acer rubrum</i> | <i>Chamaedaphne calyculata</i> | |
| <i>Picea abies</i> | <i>Acer saccharum</i> | <i>Corylus cornuta</i> | |
| <i>Picea glauca</i> | <i>Acer spicatum</i> | <i>Juniperus communis</i> | |
| <i>Picea mariana</i> | <i>Alnus crispa</i> | <i>Ledum groenlandicus</i> | |
| <i>Pinus banksiana</i> | <i>Alnus rugosa</i> | <i>Lonicera</i> spp. | |
| <i>Pinus divaricata</i> | <i>Betula alba</i> | <i>Rhamnus alnifolia</i> | |
| <i>Pinus resinosa</i> | <i>Betula papyrifera</i> | <i>Rosa</i> spp. | |
| <i>Pinus strobus</i> | <i>Betula pumila</i> | <i>Rubus</i> spp. | |

| Conifers | Deciduous trees | Shrubs | References |
|--|------------------------------|--------------------------------|--|
| Midwestern: Great Lakes (cont.) | | | |
| <i>Thuja occidentalis</i> | <i>Fagus grandifolia</i> | <i>Salix</i> spp. | |
| <i>Tsuga canadensis</i> | <i>Ostrya virginiana</i> | <i>Shepherdia canadensis</i> | |
| | <i>Populus grandidentata</i> | <i>Viburnum</i> spp. | |
| | <i>Populus pennsylvania</i> | | |
| | <i>Populus tremuloides</i> | | |
| | <i>Populus virginiana</i> | | |
| | <i>Prunus pennsylvanica</i> | | |
| | <i>Prunus serotina</i> | | |
| | <i>Prunus virginiana</i> | | |
| | <i>Pyrus malus</i> | | |
| | <i>Quercus rubra</i> | | |
| | <i>Sorbus americana</i> | | |
| | <i>Ulmus americana</i> | | |
| Western: Rockies, Cascades & Intermountain West | | | |
| <i>Abies lasiocarpa</i> | | <i>Amelanchier alnifolia</i> | Adams 1959 (MT) Black 1965 (OR) Radwan & Campbell 1968 (WA) Borrecco 1976 (WA) Sullivan and Sullivan 1983 (BC) Koehler 1990a (WA) Thomas et al. 1997 (WA) Wirsing and Murray 2002 (ID) Zahratka 2004 (CO) Zimmer 2004 (MT) Ellsworth and Reynolds 2006 |
| <i>Abies grandis</i> | | <i>Arctostaphylos uva-ursi</i> | |
| <i>Larix occidentalis</i> | | <i>Ceanothus</i> spp. | |
| <i>Picea engelmannii</i> | | <i>Juniperus scopulorum</i> | |
| <i>Pinus contorta</i> | | <i>Mahonia repens</i> | |
| <i>Pinus monticola</i> | | <i>Paxistima myrsinites</i> | |
| <i>Pinus ponderosa</i> | | <i>Pteridium aquilinum</i> | |
| <i>Pseudotsuga menziesii</i> | | <i>Rosa</i> spp. | |
| <i>Thuja plicata</i> | | <i>Rubus</i> spp. | |
| <i>Tsuga heterophylla</i> | | <i>Salix coulteri</i> | |
| | | <i>Shepherdia canadensis</i> | |
| | | <i>Spiraea betulifolia</i> | |
| | | <i>Symphoricarpos albus</i> | |
| | | <i>Vaccinium</i> spp. | |
| Northern Boreal Forest | | | |
| <i>Picea glauca</i> | <i>Alnus crispa</i> | <i>Amelanchier alnifolia</i> | Wolff 1978 (AK) Bryant 1981 (AK) Smith et al. 1988 (Yukon) |
| <i>Picea mariana</i> | <i>Alnus rugosa</i> | <i>Betula glandulosa</i> | |
| | <i>Betula papyrifera</i> | <i>Corylus cornuta</i> | |
| | <i>Populus balsamifera</i> | <i>Ledum decumbens</i> | |
| | <i>Populus tremuloides</i> | <i>Rosa</i> spp. | |
| | | <i>Salix</i> spp. | |

Snowshoe hare ecology

Snowshoe hare activity levels are highest during the spring and summer, requiring the greatest level of energy intake; activity levels decrease to a moderate level during fall, and are lowest during winter (Abele 2004). Hares excrete soft pellets known as cecotropes (Pehrson 1983, Björnhag 1994). Once excreted, cecotropes are often re-ingested, enabling hares to recapture important components including vitamins, electrolytes and proteins (Björnhag 1994).

Herbaceous foods (deciduous shrubs and other leafy greens) are selected when available during spring through fall (Plate 2.7). Hares switch to woody browse (branches, twigs, small stems, and evergreen needles) during the winter in response to snow depth and changes in available food sources (Hodges 2000a, Wirsing and Murray 2002, Murray 2003, Zimmer 2004).



Laurel Peelle

Plate 2.7. The diet of snowshoe hares provides energy-rich proteins necessary for growth and maintenance. The winter diet is largely restricted to buds and twigs of conifers, while the summer diet is more varied.

Snowshoe hares consume a variety of plant materials that when combined yield high nutritional content (Belovsky 1984, Sinclair et al. 1988, Rodgers and Sinclair 1997, Seccombe-Hett and Turkington 2008). Foraging strategies that maximize energy and protein intake and provide other necessary nutrients, while minimizing fiber and the need for secondary consumption, may explain selection of specific plant types (Ellsworth and Reynolds 2006, Seccombe-Hett and Turkington 2008). For example, buds or small twigs ≤ 4 mm (≤ 0.2 in) in diameter provide protein-rich resources (Pease et al. 1979, Wolff 1980, Fox and Bryant 1984, Hodges 2000a), while certain herbs and fungi provide increased sodium levels (Belovsky 1984). Lodgepole pine contains high levels of digestible protein (Holter et al. 1974, Ellsworth 2004) making it one of the most important winter food items for hares (Wirsing and Murray 2002, Ellsworth and Reynolds 2006).

Reproduction. The breeding season generally begins in winter (January–April) and ends in fall (July–October). Snowshoe hares are polygamous and can produce multiple litters during the breeding season (Ellsworth and Reynolds 2006). On average, snowshoe hares produce 2–4 litters per year, with 2–6 young per litter, for a total annual production of 6–13 offspring per adult female (Murray 2003).

In cyclic populations, pregnancy rate, litter size, and annual fecundity vary substantially between years (O'Donoghue and Krebs 1992, Hodges et al. 2001, Stefan and Krebs 2001). In Alberta, the mean number of young per adult female ranged from 7.5 during the cyclic low to 17.9 at the cyclic high (Meslow and Keith 1968, Cary and Keith 1979).

Non-cyclic snowshoe hare populations in the southern distribution have lower overall productivity, with some differences observed between eastern and western populations. It is speculated that increased stress levels caused by higher predation risk (Boonstra and Singleton 1993, Boonstra et al. 1998), shorter breeding seasons at higher elevations (Murray 2000), and reduced reproductive capabilities due to the smaller size of adult females (Nagorsen 1985) could be factors influencing the lower productivity of southern populations.

Snowshoe hare ecology

Snowshoe hares achieve adult body weight approximately 9–11 months following birth (Keith and Windberg 1978). The rate of juvenile dispersal varies between populations, ranging from <10% (Hodges 1998) to as much as 50% (Gillis and Krebs 1999).

Survival. Juvenile survival appears to be one of the most significant factors contributing to population decline, stability, or growth in both northern and southern populations (Green and Evans 1940, Meslow and Keith 1968, Dolbeer and Clark 1975, Keith 1981, Krebs et al. 1986, Hodges et al. 2001). Griffin (2004) used demographic modeling in Montana to evaluate population growth rates based on juvenile and adult survival, fertility rates of hare populations, and source/sink dynamics within various habitats. Annual survival appeared to have a greater influence on population growth than did reproduction rates. Similarly, Keith and Windberg (1978) found juvenile survival to be the most sensitive demographic parameter in a cyclic population in Alberta. In Colorado, juvenile survival rates of at least 16% contributed to population stability (Dolbeer and Clark 1975) while 28% juvenile survival was required for population growth in the Yukon (Hodges et al. 2001).

Mortality. Predation (Plate 2.8) is the leading cause of mortality for snowshoe hare throughout its range (Hodges 2000a). Of post-weaned mortality, 58–100% was attributable to predators in northern hare populations (Brand et al. 1975, Keith et al. 1984, Boutin et al. 1986, O'Donoghue 1994, Murray et al. 1997, Ferron et al. 1998, Gillis 1998, Hodges et al. 2001) and 80–100% in southern hare populations (Sievert and Keith 1985, Keith et al. 1993, Cox et al. 1997, Wirsing et al. 2002, Abele 2004, Bull et al. 2005).

Predators of adult snowshoe hares include lynx, bobcats (*Lynx rufus*), red foxes (*Vulpes vulpes*), coyotes (*Canis latrans*), gray wolves (*Canis lupus*), fishers (*Martes pennanti*), American martens (*Martes americana*), mink (*Mustela vison*), wolverines (*Gulo gulo*), mountain lions

(*Felis concolor*), northern goshawks (*Accipiter gentilis*), red-tailed hawks (*Buteo jamaicensis*), golden eagles (*Aquila chrysaetos*), northern hawk-owls (*Surnia ulula*), great gray owls (*Strix nebulosa*), great horned owls (*Bubo virginianus*), barred owls (*Strix varia*), and common ravens (*Corvus corax*; Adams 1959, Earhart and Johnson 1970, Rausch and Pearson 1972, Keith et al. 1977, Raine 1987, Kuehn 1989, Keith 1990, Poole and Graf 1996, Rohner and Krebs 1996, O'Donoghue et al. 1997, Stenseth et al. 1997, McIntyre and Adams 1999, Hodges et al. 2001, Wirsing et al. 2002). Predators of juvenile hares also include red squirrels, arctic ground squirrels (*Spermophilus parryii*), short-tailed weasels (*Mustela erminea*), boreal owls (*Aegolius funereus*), and American kestrels (*Falco sparverius*; O'Donoghue 1994, Stefan 1998, Hodges et al. 2001). Predation risk may vary by season, influencing the species of predators that are present and their hunting efficiency (Ellsworth and Reynolds 2006).



Plate 2.8. Snowshoe hares are vulnerable to predation by many predators. Lynx are a primary predator, especially in winter.

Competition with other browsers. Dodds (1960), Bookhout (1965), and Krefting (1975) considered the potential for competition between snowshoe hares and native ungulates. Moose and snowshoe hares appeared to concentrate their use in different areas and did not limit the other's population through overbrowsing (Dodds 1960). The potential for competition was also lowered due to differences in browse heights between ungulates and hares (Dodds 1960, Bookhout 1965, Oldemeyer 1983). Still, Telfer (1972) found some overlap between browsing of white-tailed deer and snowshoe hare in Nova Scotia and New Brunswick. The vertical distribution of winter browsing by snowshoe hares, between 0.6–1.5 m (2–5 ft), was the same as white-tailed deer browsing during the fall and spring (Telfer 1974). However, in all of these studies it is unlikely that co-occurring herbivores resulted in population limitation of hares.

Population cycle. The snowshoe hare cycle is thought to be generated by an interaction between hares, their winter food supply, and predation (Keith et al. 1977, Akcakaya 1992, Royama 1992, Krebs et al. 1995, Stenseth 1995). Keith (1990) summarized the results of several studies on the snowshoe hare population cycle and food supply in northern boreal forests. Overwinter browse estimates during the hare peak and post-peak indicated a shortage of food. Weight losses of hares were significantly negatively correlated with browse availability. Hares suffering from malnutrition or starvation showed symptoms of low body mass and depressed levels of blood sugar and liver glycogen. Lower rates of reproduction, growth, and survival followed winters of high weight loss. In food manipulation experiments, mean winter weights were lower and overwinter weight losses greater for hares in food-scarce treatments. In addition, food scarcity led to shorter breeding seasons and a decrease in mean natality. Keith (1990) concluded that food shortage at a regional rather than local scale controlled the hare cycle.

Several subsequent studies indicated that while hares reduced shrub biomass (Smith et al. 1988, Krebs et al. 2001a, Krebs 2011), it was unlikely that populations were limited by food quantity at any time during their cycle (Krebs et al. 2001a, Krebs 2011). Krebs et al. (1986) found that food additions may increase hare densities, but did not prevent the decline phase of the cycle. The quality of the diet was shown to limit populations by reducing reproduction and juvenile survival (Keith et al. 1984, Boutin et al. 1986, Aubry et al. 2000, Mowat et al. 2000, Hodges et al. 2001).

Boonstra and Singleton (1993) and Boonstra et al. (1998) suggested that the main mechanism causing the cycle may be decreased survival and reproduction during the decline phase of the cycle, due to a lag time when predator numbers are still increasing and predation rate is heightened. Hares are then thought to avoid high-risk areas by selecting dense cover, which may provide poorer quality food resources (Hik 1994, 1995), resulting in lowered reproduction rates (Boonstra and Singleton 1993, Boonstra et al. 1998). Sherriff et al. (2009) also suggested that stress related to predation may be responsible for hare population crashes by influencing reproduction.

Boonstra et al. (1998) found evidence that risk of predation causes hares to be chronically stressed, which may increase hare vulnerability to predation and decrease hare fecundity. This indicated the snowshoe hare population cycle is driven by an interaction between food and predation (Krebs et al. 1995).

As a specialist predator in the northern boreal forest, lynx populations help to maintain the snowshoe hare population cycle (Anderson and Erlinge 1977, Korpimäki et al. 1991, Hanski et al. 2001). In more southern latitudes, the greater abundance and diversity of generalist predators are thought to have a stabilizing effect because of their ability to “prey switch” when a given prey item becomes scarce (Ellsworth and Reynolds 2006). The interaction of habitat patchiness with more abundant and diverse predator guilds may explain why southern snowshoe hare populations lack cyclicity (Dolbeer and Clark 1975, Wolff 1980, Wolff 1981, Buehler and Keith 1982, Keith et al.

Snowshoe hare ecology

1993, Wirsing et al. 2002). Hodges (2000b) discussed 2 models that may explain the lack of cyclicity of snowshoe hares in the southern distribution: the refugium model and the facultative predator model. The refugium model involves 5 components: higher survival by hares in refuge habitats (i.e., dense horizontal cover), hare distribution changes during the cycle (a higher proportion of hares in refugium during the low), lower reproductive rates in refugium, lower survival in non-refugium habitats, and lower overall survival of hares in the southern part of the range. The facultative predator model is driven by higher mortality of snowshoe hares and a higher proportion of mortality by facultative predators than in northern populations.

Importance of snowshoe hare to lynx. The distributions of snowshoe hare and lynx overlap across much of North America (Bittner and Rongstad 1982, McCord and Cardoza 1982). Snowshoe hares are the primary prey of lynx, composing 35–97% of the diet throughout the range of the lynx (Saunders 1963a, van Zyll de Jong 1966, Brand and Keith 1979, Parker et al. 1983, Quinn and Parker 1987, Koehler and Aubry 1994, Apps 2000, Mowat et al. 2000, O'Donoghue et al. 2001, Squires and Ruggiero 2007, Burdett 2008, Hanson and Moen 2008, Maletzke et al. 2008, Shenk 2009). Lynx habitat selection largely reflects that of hares, both seasonally as well as through the hare population cycle (O'Donoghue et al. 1998, Mowat and Slough 2003, Squires and Ruggiero 2007, McCann and Moen 2011).

During the low of the snowshoe hare cycle in the northern boreal forest, the proportion and importance of other prey species such as red squirrels increase in the diet of lynx (Brand et al. 1976, O'Donoghue et al. 1998, Apps 2000, Mowat et al. 2000). Although lynx populations rely more heavily on alternate prey during lows in the hare cycle or in areas where hare population densities are naturally low, Roth et al. (2007) found that hares still make up >50% of the biomass of lynx diets for all populations studied.

In Maine, 98% (40 of 41) of lynx kills located while backtracking lynx were snowshoe hare; the exception (1 of 41) was a red squirrel (Fuller 2006, Fuller et al. 2007, Vashon et al. 2012). Hare remains were found in 76% of the lynx scats in Minnesota (Hanson and Moen 2008), and 92% of the kills documented via snow-tracking were snowshoe hare (Burdett 2008). In Montana, Squires and Ruggiero (2007) reported that even in areas with consistently low densities (0.1–0.6 hares/ha [0.04–0.02 hares/ac]), snowshoe hares still accounted for 96% of biomass in the lynx diet, with red squirrels and grouse accounting for only 2% each of the biomass in lynx diets during winter. In Colorado, 66.4±5.6% of annual documented kills by lynx (n=604) were hares, varying annually from 30.4–90.8%, while an average of 22.6±5.7% were red squirrels (Shenk 2009). In Washington, 81% (17 of 21) of the kills located along lynx trails were snowshoe hare, while 14% (3 of 21) were red squirrels (Maletzke et al. 2008).

Energetic analysis suggests that lynx should consume 0.4–0.5 hares per day to satisfy caloric needs (Nellis et al. 1972). In the northern portion of its range, lynx consumption rates averaging 0.5–1.2 hares per day were calculated using various methods (Saunders 1963a, Brand et al. 1976, Keith et al. 1977, Parker 1981, O'Donoghue et al. 1998).

Red squirrel ecology

Description. The red squirrel is the most widespread species of tree squirrel in the genus *Tamiasciurus* (Obbard 1987). It is a small tree squirrel, with head and body 18–20 cm (7–8 in) in length and tail 10–15 cm (4–6 in) in length (Plate 2.4).

Red squirrels range from Alaska, Yukon Territory, Northwest Territories and Quebec southward to the Rocky Mountains of New Mexico in the west, and to the southern Appalachian Mountains of South Carolina in the east

Red squirrel ecology

(Miller and Kellogg 1955, Hall and Kelson 1959, Peterson 1966, Walker 1968, Banfield 1974, Honacki et al. 1982). Their range is closely associated with boreal forests of Alaska and northern Canada, subalpine montane coniferous forests of western Canada and the United States, and mixed-coniferous and hardwood forests of the eastern United States and Canada (Peterson 1966, Walker 1968, Rowe 1972, Banfield 1974).

Activity patterns. Red squirrels are active year-round and are primarily diurnal (Godin 1977). During winter, red squirrels often are most active during the warmer mid-day period (Layne 1954, Smith 1968a, Pauls 1978). When temperatures fall below -32°C (-25°F), red squirrels are seldom active above the snow surface (Pruitt and Lucier 1958, Smith 1968a). Especially in northern portions of its range, red squirrel activity is often subnivean or subterranean during extremely cold winter periods (Pruitt and Lucier 1958, Zirul 1970).

Home range. In coniferous forests, red squirrels occupy solitary, non-overlapping contiguous territories that are defended from conspecifics of either sex (Gordon 1936, Clarke 1939, Hatt 1945, Kilham 1954, Smith 1968a). In deciduous forests, red squirrel home ranges overlap broadly, and no exclusive territories are evident (Layne 1954, Yahner 1980). This may reflect a more abundant and diverse food base in deciduous forests, which eliminates the dependence on a cached food supply (Kemp and Keith 1970, Rusch and Reeder 1978).

Habitat. Red squirrel densities tend to be highest in older, closed-canopy forests that have substantial quantities of coarse woody debris, and lower in young stands that lack cone production (Layne 1954, Obbard 1987, Klenner and Krebs 1991). Population densities are highest ($250\text{--}400/\text{km}^2$ [$96\text{--}154/\text{mi}^2$]) in spruce forests, lower ($100\text{--}200/\text{km}^2$ [$38\text{--}77/\text{mi}^2$]) in mixed conifers and mixed-conifer/hardwoods, and lowest ($25\text{--}100/\text{km}^2$ [$10\text{--}38/\text{mi}^2$]) in pines and hardwoods (Obbard 1987). Lachowski (1997) found red squirrels to be abundant across all forest types in Maine during spring, but more abundant in conifer and mixed forest during winter. Sullivan and Moses (1986) showed that red squirrel densities and recruitment were significantly higher in young (20 year-old) unthinned lodgepole pine stands (stem density of $20,000\text{--}35,000/\text{ha}$ [$8,000\text{--}14,000/\text{ac}$]), than in thinned stands (stem density $850\text{--}2,300/\text{ha}$ [$350\text{--}900/\text{ac}$]) in interior British Columbia.

Where available, spruce is used by red squirrels as nest trees. Other conifers with a high branch density are also utilized (Hatt 1945, Fancy 1980). Where cavities in coniferous trees are not available, underground nests and outside tree (leaf) nests are commonly used (Fancy 1980). In eastern hardwood forests, tree cavities offer preferred nest sites, but underground and outside tree nests are also used (Hatt 1929, Hamilton 1939, Layne 1954). Tree nests are usually located in contact with the trunk in dense stands with high canopy closure (Rothwell 1979).

Dense conifer clumps, especially those with snags or fallen logs, provide important shade and protective cover for food caches (Vahle and Patton 1983).

Diet. Conifer seeds are the basis of the red squirrel's year-round diet, but deciduous and coniferous buds are also important components during winter and spring (Smith 1968a, b; Kemp and Keith 1970, Reichard 1976, Rusch and Reeder 1978). Squirrels cut and cache newly matured conifer cones to help assure a year-round food supply (Smith 1968a, 1981; Gurnell 1984).

The activity center of each territory is the midden where seeds are cached (Larsen and Boutin 1995). Caches often accumulate over several years and provide food during cone crop failures (Smith 1968b).

Large species of fungi are eaten fresh as well as cached in the canopy for later consumption (Seton 1910, Klugh

Red squirrel ecology

1927, Hatt 1929, Layne 1954). In deciduous forests, red squirrels utilize and cache a large variety of seeds and mast from species such as oaks (*Quercus* spp.), hickory (*Carya* spp.), maple (*Acer* spp.), elm (*Ulmus* spp.), and beech (*Fagus grandifolia*; Seton 1910, Hatt 1929, Williams 1936, Layne 1954, Kemp and Keith 1970). However, these caches do not normally accumulate from year to year (Hatt 1929).

Red squirrels also prey on young hares. During highs in the hare population cycle in the Yukon, squirrel predation was a major source of mortality on young hares, which may have slowed hare population growth (Boonstra et al. 2001).

Reproduction. Females are reported to accept males onto their territories only during their 1-day estrous cycle (Smith 1968a, Rusch and Reeder 1978). Throughout most of its range, 1 litter per year is typical (Obbard 1987). However, in the southern and eastern portion of its range, 2 litters may be produced each year (Hamilton 1939, Layne 1954, Wrigley 1969, Lair 1985). Average litter size is about 3 to 5 young (Obbard 1987), depending on annual food supply (Smith 1968a, Kemp and Keith 1970, Rusch and Reeder 1978).

Mortality. Red squirrels are preyed upon by a variety of predators. Among the most common mammalian predators are fishers (Hamilton and Cook 1955, Brown and Will 1979) and martens (Marshall 1946, Quick 1955, Soutiere 1979, Lachowski 1997). The most common avian predator is northern goshawk (Meng 1959), although great horned owls (Rusch et al. 1972), red-tailed hawks (Luttich et al. 1970), broad-winged hawks (*Buteo platypterus*; Rusch and Reeder 1978), and Cooper's hawks (*Accipiter cooperi*; Meng 1959) have also been noted to prey upon red squirrels.

Importance of red squirrels to lynx. Red squirrels appear to be the most important alternate prey for lynx throughout the northern portion of their range (Brand et al. 1976, O'Donoghue et al. 1998, Apps 2000). Red squirrel remains occurred in 56% (10 of 18) of lynx winter scats from the Northwest Territories (More 1976) and 9% (2 of 23) of the summer digestive tract samples from northern Alberta and the Northwest Territories (van Zyll de Jong 1966). Red squirrel densities appeared to fluctuate independently of the snowshoe hare cycle during a 10-year project in the Yukon (Krebs et al. 2001b).

Koehler (1990a) reported that red squirrels occurred in 24% of lynx scats in north-central Washington. In contrast, Burdett (2008) and Hanson and Moen (2008) analyzed 87 lynx scat samples collected during winter in Minnesota and found no red squirrel remains. Red squirrels do not appear to be an important alternate prey in that area. Squires and Ruggiero (2007) located 86 lynx kills that included 7 prey species in their Montana study area. Snowshoe hares accounted for 69 of the kills and 11 were red squirrels. Red squirrels were only 2% of the biomass of the winter diet (Squires and Ruggiero 2007). Shenk (2007) reported that red squirrels made up 16.5% of the annual lynx diet while snowshoe hares made up 75% in Colorado.

Koehler (1990a) suggested that a diet of red squirrels alone might not be adequate to ensure lynx reproduction and survival of kittens. Rather, lynx populations appear to be limited by the availability of snowshoe hare prey, particularly during the winter months.

Lynx hunting behavior

The morphological and behavioral adaptations of felids generally accentuate visual recognition of prey and short, quick pursuits (Kleiman and Eisenberg 1973). Lynx use 2 basic methods to hunt snowshoe hares: ambushing from a hunting bed during nocturnal hours when hares are most active, and moving through hare habitat to stalk and flush hares from cover during the day (Kolbe and Squires 2007, Squires and Ruggiero 2007, Fuller et al. 2007).

In Canada, O'Donoghue (1997) reported that lynx captured red squirrels opportunistically when hares were abundant, but actively hunted red squirrels when hares were scarce. In Montana, red squirrels were taken opportunistically (Squires and Ruggiero 2007).

Although cover is important to lynx when searching for food (Brand et al. 1976), lynx often hunt along the edges of forests (Plate 2.9; Kesterson 1988, Staples 1995, Mowat et al. 2000) and dense riparian willow stands (Major 1989, Shenk 2008). Less dense stands may improve visibility for lynx and increase the vulnerability of hares (O'Donoghue et al. 1998, Fuller et al. 2007). Lower stem density may be more important than hare abundance in determining hunting success (Fuller et al. 2007).



Laurel Peelle

Plate 2.9. Lynx foraging habitat is moderately dense, allowing pursuit and capture of prey while also providing dense horizontal cover for snowshoe hares.

In Maine, lynx focused their hunting in regenerating clearcuts (Plate 2.10; 11–26 years post-harvest) and in established partially-harvested stands (11–21 years postharvest; Fuller et al. 2007). However, lynx avoided the stands with the highest stem density (14,000 stems/ha [5,668 stems/ac]) and preferentially hunted in patches with intermediate to high snowshoe hare density (Fuller and Harrison 2010). Roads and their associated edges (30 m [100 ft] on either side of roads) were selected against within lynx home ranges (Fuller et al. 2007).

In Minnesota, Burdett (2008) reported that lynx selected regenerating forests for hunting and resting sites during the winter months. Female lynx used a foraging radius of approximately 2–3 km (1.2–1.8 mi) when kittens were at the den (Moen et al. 2008).

In Montana, Squires et al. (2010) reported that horizontal cover was denser at lynx kill sites than along travel paths. They further reported that lynx kill sites were associated with a higher proportion of spruce-fir overstory than lodgepole pine overstory, and that neither snow depth nor snow penetrability influenced lynx kill sites.

Berg et al. (2012) speculated that lynx in the Greater Yellowstone Ecosystem would likely not avoid hunting in young, dense (3,194.16±553.05 stems/ha [1,293±223.9 stems/ac]) lodgepole pine patches. In this area, the stem density does not reach the 14,000 stems/ha (5,668 stems/ac) that was reported by Fuller and Harrison (2010) to be too dense for effective hunting by lynx.



Jennifer Vashon, Maine Department of Inland Fish and Wildlife.

Plate 2.10. Young, dense conifers provide excellent lynx foraging habitat in Maine.

Lynx distribution

The historical range of Canada lynx extends from Alaska across much of Canada (except for coastal forests), with southern extensions into parts of the western United States, the Great Lakes states, and New England (McCord and Cardoza 1982). Lynx distribution is closely aligned with the distribution of snowshoe hares (Bittner and Rongstad 1982, McCord and Cardoza 1982) and boreal forests (McCord and Cardoza 1982, Koehler and Aubry 1994, Agee 2000, McKelvey et al. 2000b, Mowat et al. 2000). Boreal forests extend southward from the arctic tundra in the far north, to boreal/hardwood forest ecotones in the Midwest and eastern United States, and to subalpine forests in the western United States (Agee 2000).

States with verified records of lynx

McKelvey et al. (2000b) summarized the locations of documented lynx occurrences, which were found in 24 states. A “verified record” was defined as a museum specimen or a written account in which a lynx was either in someone’s possession or observed closely, e.g., killed, photographed, trapped and released, or treed by dogs.

The National Lynx Survey, using a detection protocol developed by McKelvey et al. (1999), was conducted between 1999 and 2003 to determine the presence of lynx on federal lands. Approximately 70 sampling grids were deployed in the survey of 22 national forests. Lynx were detected on 6 of the national forests surveyed: the Okanogan-Wenatchee National Forest in Washington, the Boise and Targhee National Forests in Idaho, Shoshone National Forest in Wyoming, and Lolo and Gallatin National Forests in Montana, as well as Glacier National Park in Montana (K. McKelvey, USDA Forest Service, Rocky Mountain Research Station, unpublished data). Subsequent surveys, using a modified protocol, detected lynx in Maine and on the Superior National Forest in Minnesota.

A number of recent studies of lynx improved our knowledge of lynx distributions in specific regions (Hoving et al. 2003, 2005; Fuller et al. 2007; Koehler et al. 2008; Maletzke et al. 2008; Vashon et al. 2008a, b; Moen 2009;

Simons 2009; Fuller and Harrison 2010; Squires et al. 2013). These studies generally found that lynx are more abundant in Maine, but rarer and more patchily distributed across the western and Great Lakes regions of the United States than previously thought. This refinement in our understanding of lynx distribution is described in greater detail for each geographic area in Chapter 3.

States with verified records but not thought to support resident populations of lynx

There is substantial uncertainty about the historical distribution of lynx in the northeast (McKelvey et al. 2000b). However, recent regional-scale habitat models suggest New York, Vermont, and New Hampshire receive insufficient snow levels or contain too much deciduous-dominated landscape to support viable populations of lynx (Hoving et al. 2005). Small numbers of breeding lynx were documented in northern New Hampshire and Vermont between 2009–2011 (M. McCollough, U.S. Fish and Wildlife Service, personal communication 2012). The long-term persistence of these small populations is unknown.

Records from 1940–1997 showed an increase in lynx occurrences during the 1960s in Michigan's Upper Peninsula, a period when extensive dispersals from Canada occurred. Beyer et al. (2001) conducted track surveys that yielded no evidence of lynx in the region, and habitat models suggested there is insufficient suitable habitat or densities of snowshoe hare to support a viable population of lynx in Michigan (Linden 2006). Wisconsin is not believed to support lynx habitat or resident populations either.

Lynx presence has been recorded in North Dakota, South Dakota, Illinois, Nebraska, Kansas, and Indiana, where lynx habitat does not exist (Adams 1963, Gunderson 1978, Hoffman and Genoways 2005, Devineau et al. 2010). Most of these occurrences appear to be animals dispersing southward from Canada during lows in the snowshoe hare population cycle (McKelvey et al. 2000b) or following translocation to Colorado (Devineau et al. 2010).

There are sporadic lynx records from northeast Oregon, which are generally consistent with the time periods when there were large numbers dispersing from Canada (McKelvey et al. 2000b). There is no evidence that lynx breed and reproduce in Oregon.

Lynx population density and home range size

Lynx densities vary across the southern periphery of its range. In Maine, densities during a likely population peak ranged from 9.2–13.0 lynx/100 km² (23.8–33.7 lynx/100 mi²); if only adults are included, the density averaged 4.3 adults/100 km² (11.1 adults/100 mi²; Vashon et al. 2008a). The density in nearby Gaspé Peninsula, Quebec was estimated to be 10 lynx/100 km² (25.9 lynx/100 mi²; Ray et al. 2002). These are much higher than the density estimate of 2.3 lynx/100 km² (6.0 lynx/100 mi²) for north-central Washington (Koehler 1990a).

Reported lynx home range sizes are also quite variable (Table 2.2). Methods used to estimate home range area have not been standardized, and some of the differences in reported home range sizes reflect the home range estimator employed, type of telemetry monitoring system used (VHF, GPS, or Argos), and number of relocations of individuals. Generally, home ranges in the western United States are larger than those reported from the eastern United States or from northern Canada during peaks in snowshoe hare abundance (Aubry et al. 2000).

In Canada, average winter home ranges of 3 lynx in Newfoundland were about 18 km² (7 mi²; Saunders 1963b). In Riding Mountain National Park, Manitoba, home ranges for 2 females with kittens averaged 156 km² (60 mi²), while that of a male was estimated at 221 km² (85 mi²; Carbyn and Patriquin 1983). In southwestern Yukon, Ward and Krebs (1985) found a clear trend of increasing lynx home range size as hare densities declined. Four

Table 2.2. Mean annual home range size of Canada lynx in southern boreal forests.

| Location | Latitude (°N) | Male | | Female | | Method | Reference |
|------------------------------|------------------|------|---|--------|---|---------------------|-----------------------------|
| | | n | X ± SD | n | X ± SD | | |
| Northern Maine | 46 | 11 | 54 ± 5 km ² (21 ± 2 mi ²) | 11 | 26 ± 4 km ² (10 ± 2 mi ²) | 85% Fixed Kernel | Vashon et al. 2008a |
| Northeastern Minnesota | 48 | 4 | 267 ± 73 km ² (103 ± 28 mi ²) | 2 | 21 ± 2 km ² (8 ± 1 mi ²) | 95% MCP | Burdett et al. 2007 |
| Northeastern Minnesota | 48 | 2 | 194 km ² (75 mi ²) | 2 | 87 km ² (34 mi ²) | 95% MCP | Mech 1980 |
| Southern Canadian Rockies | 51 | 3 | 277 ± 71 km ² (107 ± 27 mi ²) | 3 | 135 ± 124 km ² (52 ± 48 mi ²) | 95% MCP | Apps 2000 |
| West-central Wyoming | 43 | 1 | 137 km ² (53 mi ²) | 1 | 114 km ² (44 mi ²) | 95% MCP | Squires and Laurion 2000 |
| Southern Colorado | 37 | 4 | 103 ± 40 km ² (40 ± 15 mi ²) | 19 | 75 ± 16 km ² (29 ± 6 mi ²) | 90% Fixed Kernel | Shenk 2008 |
| Northwestern Montana | 47 | 4 | 238 ± 99 km ² (92 ± 1 mi ²) | 2 | 115 ± 50 km ² (44 ± 19 mi ²) | 95% MCP | Squires and Laurion 2000 |
| North-central Washington | 49 | 5 | 69 ± 28 km ² (27 ± 11 mi ²) | 2 | 39 ± 2 km ² (15 ± 1 mi ²) | 100% MCP | Koehler 1990a |

home ranges corresponding with high hare densities (15 hares/ha [6 hares/ac]) averaged 13 km² (5 mi²) in size, while 7 home ranges at lowest hare densities (<1 hare/ha [<0.4 hares/ac]) averaged 39 km² (15 mi²) in size. In the Northwest Territories, Poole (1994) reported average home range size of about 17 km² (7 mi²) for 23 male and female lynx in a year of peak hare abundance, increasing to 44 km² (17 mi²) for 2 males and 62 km² (24 mi²) for 2 females in the second year of the snowshoe hare decline.

Description of lynx habitat

Lynx habitat characteristics. Lynx typically inhabit gentle, rolling topography (Maletzke et al. 2008, Squires et al. 2013). Across its range, dense horizontal cover, persistent snow, and moderate to high snowshoe hare densities (>0.5 hares/ha [0.2 hares/ac]) are common attributes of lynx habitat. The elevation at which lynx habitat occurs depends on local moisture patterns and temperatures, and varies across the range of the species. Spruce-fir forests are the primary vegetation type that characterizes lynx habitat in the contiguous United States (Koehler 1990a, Apps 2000, McKelvey et al. 2000b, Koehler et al. 2008, Moen et al. 2008, Vashon et al. 2008a, Squires et al. 2010).

The following describes general characteristics of boreal forest vegetation, snow conditions, and snowshoe hare prey base that constitute lynx habitat. More detailed information is provided for each geographic area in chapter 3.

Boreal forest vegetation. In the northeastern United States, most lynx occurrences are within the Mixed Forest-Coniferous Forest-Tundra vegetation type, at elevations of 250–500 m (820–2,460 ft; McKelvey et al. 2000b). Lynx have been documented to use both coniferous and mixed-coniferous/deciduous vegetation types dominated by white, black, and red spruce, balsam fir, pine, northern white cedar, eastern hemlock, sugar maple, aspen, and paper birch (Plate 2.11; Hoving et al. 2004, Fuller et al. 2007, Vashon et al. 2008a). Mature deciduous stands and forest openings are avoided by lynx at all spatial scales.

In the Great Lakes Geographic Area, most lynx occurrences (88%) are within the Mixed Deciduous/Conifer Forest (McKelvey et al. 2000b). Coniferous and mixed-coniferous/deciduous vegetation types dominated by pine, balsam fir, black and white spruce, northern white cedar, tamarack, aspen, paper birch, conifer bogs and shrub swamps provide lynx habitat in this geographic area (Plate 2.12; Burdett 2008, Moen et al. 2008, McCann and Moen 2011).

In the western United States, most lynx occurrences (83%) are associated with Rocky Mountain Conifer Forest, and most (77%) fall within the 1,500–2,000 m (4,920–6,560 ft) elevation zone (McKelvey et al. 2000b), except in Colorado where elevations are higher. Engelmann spruce, subalpine fir and lodgepole pine forest cover types occurring on cold, moist potential vegetation types provide habitat for lynx (Plate 2.13; Aubry et al. 2000). Dry forest cover types (e.g., ponderosa pine, dry Douglas-fir) do not provide lynx habitat (Koehler et al. 2008, Maletzke et al. 2008, Squires et al. 2010).

Snow conditions. Across the northern boreal forests of Canada, snow conditions are very cold and dry. Snow depths are relatively uniform and only moderately deep, with total annual snowfall of 100–127 cm (39–50 in; Kelsall et al. 1977). In contrast, in the southern portion of lynx range, snow depths are generally deeper, with deepest snows in the mountains of southern Col-



Mark McCollough, U.S. Fish and Wildlife Service.

Plate 2.11. Lynx habitat in the northeastern United States is dominated by white, black, and red spruce, white cedar, sugar maple, and aspen.



Ron Moen, University of Minnesota, Duluth.

Plate 2.12. Lynx habitat in the Great Lakes area is dominated by balsam fir and white spruce.

orado. Snow in southern lynx habitats may be subjected to more freezing and thawing than in the northern portion of lynx range (Buskirk et al. 2000b), although this varies with elevation, aspect, and local weather conditions. It has been suggested that crusting or compaction of snow may reduce the competitive advantage that lynx have in soft snow because of their long legs and low foot loadings (Buskirk et al. 2000a).

Snowshoe hare prey base. A landscape density of >0.5 hares/ha (0.2 hares/ac) has been suggested to be necessary to sustain lynx within their home ranges (Mowat et al. 2000, Ruggiero et al. 2000b). A density of <0.3 hares/ha (0.12 hares/ac) correlates with observations of adult lynx emigrating from their home ranges in Canada and is thought to be too low to support lynx survival (Mowat et al. 2000).

Steury and Murray (2004) indicated that a density of >1.5 hares/ha (0.6 hares/ac) would be necessary to enable a reintroduced lynx population to persist. However, snowshoe hare densities across the southern range are consistently below this density (Keith 1990, Hodges 2000b, Murray 2000). Murray et al. (2008) acknowledged that this may be an overly conservative estimate for a threshold density, given differences in population dynamics between northern and southern populations of hares and lynx.

Lynx occurrence in northern Maine is strongly associated with landscape-scale hare densities of >0.74 hares/ha (0.39 hares/ac; Simons 2009, Simons-Legaard et al. 2013). Stands that had snowshoe hare densities of >1.5 hares/ha (0.6 hares/ac) supported female lynx accompanied by kittens and a 78% kitten survival rate (Vashon et al. 2008a). Lynx did not occupy areas where landscape-scale hare densities were <0.5 hares/ha (0.2 hares/ac; Simons-Legaard et al. 2013).

Seasonal variation in lynx habitat use. In the western United States in winter, lynx selected for mature multi-story stands dominated by Engelmann spruce and subalpine fir (Plate 2.14; Koehler et al. 2008, Squires et al. 2010). These stands consisted primarily of large diameter trees where limbs reached the snow at ground level



Gary Koehler

Plate 2.13. Lynx habitat in the western United States is dominated by Engelmann spruce, subalpine fir, and lodgepole pine.



Northern Rockies Lynx Project, Rocky Mountain Research Station, USDA Forest Service.

Plate 2.14. In the western United States, mature multi-story forests with dense horizontal cover and lower live limbs at the snow surface provide good lynx foraging habitat during winter.

and contributed to dense horizontal cover (Squires et al. 2010). In Montana, the proportion of overstory size classes of trees in forests used by lynx in winter were 5% saplings (2.5–8 cm [1–3 in] dbh), 19% pole (8–18 cm [3–7 in] dbh), 42% mature (18–28 cm [7–11 in] dbh), and 29% large (>28 cm [>11 in] dbh). Regenerating stands composed of small diameter saplings <10 cm (<4 in) dbh in dry forest types, recent clear-cuts, and forest openings across all spatial scales were generally avoided during winter (Koehler et al. 2008, Maletzke et al. 2008, Squires et al. 2010). Lynx remained near the forest edge when crossing forest openings, and the average crossing distance was 117 m (384 ft) with a range of 40–379 m (131–1,243 ft; Squires et al. 2010).

In contrast to habitat use by lynx in winter, Squires et al. (2010) found forest stands in Montana with mature and large diameter trees were used less often during summer. Lynx broadened their selection to include younger regenerating stands composed of Engelmann spruce and subalpine fir with abundant small diameter and pole sized trees (8–18 cm [3–7 in] dbh), abundant total shrubs, and high horizontal cover (Squires et al. 2010). The proportion of overstory size classes of trees in forests used by lynx in summer were 66% pole (8–18 cm [3–7 in] dbh), 21% mature (18–28 cm [7–11 in] dbh), and 6% large (>28 cm [>11 in] dbh). Lynx generally avoided forest types with high proportions of Douglas-fir, grass in the understory, or snags. Elevations used by lynx were 136 ± 24 m [446 ± 79 ft] higher in summer than during the winter but still occurred in the montane zone between the alpine zone and the dry forests of the lower montane zone (Squires et al. 2010).

Foraging habitat. In the contiguous United States, lynx focus their foraging in conifer and conifer-hardwood habitats that support their primary prey of snowshoe hares. Winter habitat may be more limiting for lynx (Squires et al. 2010). Dense saplings or mature multi-layered stands are the conditions that maximize availability of food and cover for snowshoe hares at varying snow depths throughout the winter.



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Plate 2.15. Natural disturbance processes, including wildfire, wind events, and insect outbreaks, create early seral forest structure that can develop into the dense structure used by snowshoe hares.

Natural disturbance processes that create early successional stages exploited by snowshoe hares include fire, insect infestations, wind throw, and disease outbreaks (Plate 2.15; Kilgore and Heinselman 1990, Veblen et al. 1998, Agee 2000). Both timber harvest and natural disturbance processes provide foraging habitat for lynx when the resulting stem densities and stand structure meet the habitat needs of snowshoe hare (Plate 2.16; Keith and Surrendi 1971; Fox 1978; Conroy et al. 1979; Wolff 1980; Parker et al. 1983; Litvaitis et al. 1985; Bailey et al. 1986; Monthey 1986; Koehler 1990a, b).



Gary Koehler

Landscapes containing a mix of forest age classes are more likely to provide lynx foraging habitat throughout the year (Poole et al. 1996, Griffin and Mills 2004, Squires et al. 2010). In winter, lynx do not appear to hunt in openings, where lack of cover limits habitat for snowshoe hares (Mowat et al. 2000, Maletzke et al. 2008, Squires et al. 2010). Areas with recent timber harvest and areas recently burned can contribute herbaceous summer foods for snowshoe hares, and woody winter browse will develop on older sites (Fox 1978). Multi-story stands may provide a greater availability of browse as snow depths vary throughout the winter.



Gary Koehler

Plate 2.16. Regrowth following stand-replacing wildfires can develop dense horizontal cover that supports high densities of snowshoe hares.

In the eastern United States, lynx habitat selection at the home range scale includes extensive areas of regenerating spruce-fir stands 15–35 years after clearcut or other even-aged harvest, with >50–60% canopy closure and intermediate (7,000–11,000 stems/ha [2,834–4,453 stems/ac]) to high (up 14,000 stems/ha [5,668 stems/ac]) stem density (Fuller et al. 2007, Vashon et al. 2008b, Scott 2009, Simons 2009). The highest hare densities were found where stem densities exceeded 14,000 stems/ha (5,668 stems/ac), but lynx selected stands with intermediate stem density and intermediate to high hare densities for hunting (Fuller et al. 2007). Simons-Legaard et al. (2013) found the probability of lynx occurrence exceeded 90% when a density of >0.74 snowshoe hares/ha (0.39 hares/ac) and >10% mature conifer forest were present.

In Minnesota, Burdett (2008) reported that lynx selected regenerating forest, dominated by conifer with extensive forest edge; lynx beds (resting and hunting) and kill sites were associated with regenerating and mixed forest. McCann and Moen (2011) found snowshoe hare densities were highest in regenerating forests.

In the western United States, development of a high density $>11,250/\text{ha}$ ($>4,500/\text{ac}$) of young conifer stems and branches protruding above the snow was found to provide foraging habitat for lynx within about 10–40 years following disturbance, depending on site productivity, forest type and intensity of disturbance (Sullivan and Sullivan 1988, Koehler 1990a). This habitat is temporary, as the tree stems and branches eventually grow out of reach of snowshoe hares and shade out understory saplings and shrubs. Mature multi-story conifer forests with low limbs and a substantial understory of young trees and shrubs provide stable lynx foraging habitat (Murray et al. 1994, Koehler et al. 2008, Squires et al. 2010, Ivan 2011a). In north-central Washington, high snowshoe hare densities (>1.0 hares/ha [0.4 hares/ac]) were associated with sapling (<10 cm [<4 in] dbh) densities of $2,784\pm 281$ stems/ha ($1,127\pm 114$ stems/ac) and medium-sized (10–28 cm [4 – 11 in] dbh) tree densities of 712 ± 80 stems/ha (288 ± 32 stems/ac; Walker 2005).

Lynx denning habitat and den site characteristics. Natal and maternal den sites are used until kittens reach about 6–8 weeks of age (Slough 1999, Moen et al. 2008). For denning habitat to be functional, it must be in or adjacent to foraging habitat (Plate 2.17; Moen et al. 2008). Maternal dens are generally located close to natal dens (median distance of 107 m [351 ft]) and are similar in forest structure characteristics (Slough 1999, Squires et al. 2008). Kittens are left alone at den sites while the female lynx hunts (Slough 1999, Moen et al. 2008, Olson et al. 2011). Coarse woody debris provides kittens with protection from extreme temperatures, precipitation, or predators (Boutros et al. 2007, Moen et al. 2008).



Plate 2.17. Lynx denning habitat is structurally complex, typically located near foraging habitat and containing a high volume of large down logs.

The common components of natal and maternal den sites appear to be large woody debris (Plate 2.18; down logs or root wads) and dense horizontal cover (Koehler 1990a, Mowat et al. 2000, Squires and Laurion 2000, Moen et al. 2008, Organ et al. 2008, Squires et al. 2008). Dens have occasionally been located under ledges in boulder fields (individual boulders >1 m [>3.3 ft] diameter), under live vegetation such as alder



Gary Koehler

Plate 2.18. The majority of lynx dens in the contiguous United States are associated with large, down logs in mature conifer forests.

(*Alnus* spp.) and Pacific yew (*Taxus brevifolia*), or in slash piles (Moen et al. 2008, Squires et al. 2008). Den sites typically are situated within older regenerating stands (>20 years since disturbance) or in mature conifer or dense regenerating mixed-conifer-deciduous (typically spruce/fir or spruce/birch) forests (Koehler 1990a, Slough 1999, Moen et al. 2008, Organ et al. 2008, Squires et al. 2008). Stand structure appears to be more important than forest cover type (Mowat et al. 2000). The availability of den sites does not appear to be limiting (Gilbert and Pierce 2005, Moen et al. 2008, Organ et al. 2008, Squires et al. 2008).

In Maine, lynx dens were primarily located in stands of sapling-sized trees dominated by conifers, where blown-down trees provided cover and the canopy opening promoted understory growth and dense horizontal cover (Organ et al. 2008). In Minnesota, Moen et al. (2008) reported that sites selected by female lynx for denning had lower stem densities than surrounding areas, with >80% of tree stems being coniferous species including white or black spruce, balsam fir and northern white cedar. The amount of regenerating forest increased in areas surrounding these dens at a distance of 100–500 m (328–1,640 ft; Moen et al. 2008). In Montana and Colorado, lynx primarily denned in mature Engelmann spruce and subalpine fir stands in concave drainages or basins with dense horizontal cover and abundant coarse woody debris (Shenk 2008, Squires et al. 2010).

Lynx population dynamics

Reproduction. Breeding occurs during March and April in the northern part of the range of lynx (Quinn and Parker 1987). Male lynx may be incapable of breeding during their first year (McCord and Cardoza 1982). Males are not known to help rear young (Eisenberg 1986).

In the Yukon near Whitehorse, the timing of kitten births differed somewhat by age class of female lynx.

Adult females delivered kittens on May 23 ± 6 days, while yearlings gave birth from 1–3 weeks later on June $17 \text{th} \pm 7$ days (Slough 1999). Kittens were born in May to June in south-central Yukon (Slough and Mowat 1996). Kittens were born in early May in Minnesota (Moen et al. 2008), and from 26 April to 23 May in Montana (Olson et al. 2011). In Maine, 1 female that may have lost her first litter appeared to have had a second litter in August (Vashon et al. 2012).

In Montana, female lynx stayed in natal dens on average for 21 ± 17 days, and subsequently used an average of 3 ± 2 maternal dens in a given year (Olson et al. 2011). Nine female lynx exhibited roughly equal levels of activity from dawn to dusk when they had newborn to 2-month-old kittens. Females caring for kittens were more active during the day compared to pre- or post-denning periods, and they travelled shorter daily distances than before their kittens were born (Olson et al. 2011).

Kitten production and survival. Litter size of adult females averages 4–5 kittens during periods of hare abundance in the northern boreal forest (Mowat et al. 1996). Based on snow-tracking in the Yukon, O'Donoghue et al. (2001) found evidence of family groups with 1–6 kittens. In Canada during the low phase of the hare cycle, few if any live kittens are born, and few yearling females conceive (Brand and Keith 1979, Poole 1994, Slough and Mowat 1996). However, some lynx recruitment may still occur when hares are scarce and this may be important in maintaining the lynx population through the cyclic low (Mowat et al. 2000).

In Maine, during years of high hare populations (1999–2005), 89% of radio-collared females of breeding age had kittens, and average litter size was 2.74 kittens (Plate 2.19; Vashon et al. 2012). During years of low hare populations (2006–2010), 30% of breeding age females had kittens with litter size averaging 2.25 kittens (Vashon et al. 2012). During both time periods (1999–2010), 78% of kittens were with their mother the following January or February after birth (Vashon et al. 2012). This high productivity and survival rate is be-



Plate 2.19. Lynx natal dens are typically located under large logs that provide protection for kittens. Litter size is generally 2–3 kittens in the contiguous United States, but can be as many as 5.

lied to be indicative of good habitat quality and prey abundance in the study area (Vashon et al. 2008a).

In Minnesota, 5 dens were monitored from 2004–2006. Four of 5 females had litters in consecutive years; the 9 litters ranged from 2–5 kittens (average 3.22 ± 0.97 ; Moen et al. 2008). One radio-collared female bred and had a litter at 2 years of age (Moen et al. 2008).

In Wyoming, 1 female produced 4 kittens in 1998 and 2 kittens in 1999 (Squires and Laurion 2000). In Montana, Squires and Laurion (2000) reported that 1 female produced 2 kittens in 1998, and in 1999, 2 of 3 females produced litters of 2 kittens each. From 1999–2006, 57 dens of 19 female lynx were located in the Seeley Lake, Garnet Range, and Purcell Mountains in western Montana (Squires et al. 2008); litter size data from this study are not yet available.

In Colorado, the number of dens that were located peaked in 2005 ($n=17$ dens while monitoring 42 females), and subsequently decreased to 4 dens in 2006. No dens were located in 2007 or 2008 while monitoring 34 and 28 females, respectively (Shenk 2008). The average number of kittens per litter was 2.78 and the sex ratio of males to females was 1:1.14 (Shenk 2008).

In north-central Washington, 2 radio-collared females had litters of 3 and 4 kittens in 1986, and each had at least 1 kitten in 1987 (Koehler 1990a). Of these litters, only 1 kitten survived to its first winter. However, during 2001–2004, snow tracking showed females to be accompanied by 1–3 kittens in their first winter, but dispersal and survival rates were unknown (von Kienast 2003, Maletzke 2004, Maletzke et al. 2008). Koehler (1990a) suggested that the relatively low number of kittens produced in north-central Washington was comparable to northern populations during periods of low snowshoe hare abundance.

Mortality. The most commonly reported causes of mortality are starvation, especially of kittens (Quinn and Parker 1987, Koehler 1990a, Vashon et al. 2012), and human-caused mortality (Ward and Krebs 1985, Bailey et al. 1986, Moen 2009). Longevity records indicate lynx live up to 16 years in the wild (Kolbe and Squires 2006). Life spans could vary between regions due to different sources and rates of mortality.

In Maine, 26% (17 of 65) of the mortalities of radio-collared lynx were from starvation, even during times when hare populations were high (Vashon et al. 2012). Other sources of mortality included predation and suspected predation (42%, 27 of 65), legal and illegal harvest both in Maine and Canada (15%, 10 of 65), vehicles (3%, 2 of 65), and disease (2%, 1 of 65; Vashon et al. 2012).

In Minnesota, half of 14 animals radiocollared in the 1970s were shot or trapped, and all recorded mortalities were associated with human causes (Mech 1980). Of lynx that were radiocollared from 2003–2008, Moen (2009) reported that 75% of the mortalities were associated with humans.

In the reintroduced population in Colorado, the primary sources of known mortality were shooting (14 known and 5 probable of 102 mortalities), vehicle collisions (13 of 102), and starvation (10 of 102; Devineau et al. 2010). Other confirmed causes were predation (3 known and 3 probable of 102), disease (7 of 102), illness (2 of 102), and other trauma (8 of 102). Plague was diagnosed as the cause of the 7 lynx mortalities attributed to disease, which was apparently contracted after release in Colorado (Wild et al. 2006). The cause of mortality did not appear to differ between males and females (Devineau et al. 2010).

In cyclic lynx populations of the northern boreal forest, most natural lynx deaths are attributed to starvation during years of low hare abundance (Poole 1994, Slough and Mowat 1996). Hunger-related stress is also

thought to induce dispersal, which may increase the exposure of lynx to other forms of mortality such as trapping and highway collisions (Brand and Keith 1979, Carbyn and Patriquin 1983, Ward and Krebs 1985, Bailey et al. 1986).

Predation on lynx by mountain lion, coyote, wolverine, gray wolf, fisher, and other lynx has been confirmed (Plate 2.20; Berrie 1974, Koehler et al. 1979, Poole 1994, Slough and Mowat 1996, O'Donoghue et al. 1997, Apps 2000, Squires and Laurion 2000, O'Donoghue et al. 2001, Vashon et al. 2012). In Maine, 14 of 18 lynx that died of predation were killed by fishers, which were suspected at 4 additional predation events (Vashon et al. 2012). Squires and Laurion (2000) reported 2 of 6 mortalities of radio-collared lynx in Montana were due to mountain lion predation. In Colorado, 3 of 102 lynx mortalities were confirmed as predation (Devineau et al. 2010).

Population cycles. Based on the Hudson's Bay Company fur trading records, Elton and Nicholson (1942) documented cyclic 8–11 year oscillations of northern lynx populations, corresponding to similar fluctuations in snowshoe hare abundance. Since then, many studies in northern boreal forests have provided further evidence that lynx populations there are tightly linked to the cyclic abundance of snowshoe hares, with the 2 species exhibiting largely synchronous 8–11 year cycles across Canada and Alaska (Keith et al. 1977, Sinclair et al. 1993, Poole 1994, Mowat et al. 2000, Murray et al. 2008). Stenseth et al. (1999) suggested that lynx population dynamics are synchronized by climatic patterns typical of the Pacific, Continental, and Atlantic zones that are affected by the North Atlantic Oscillation. Stenseth et al. (2004) used a model to test the effect of climate forcing as a synchronizer of regional density fluctuations, and suggested that climate forcing could result in synchrony within regions and asynchrony between regions.

Lynx typically exhibit a 1–2 year delay in peak abundance following a peak in hare abundance (Elton and Nicholson 1942, Keith 1963, O'Donoghue et al. 1997). During a cyclic decline in hare numbers, lynx demonstrate lower survival than during any other phase in the cycle (O'Donoghue et al. 1997). In Alberta, Keith et al. (1977) found that lynx responded to the



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Plate 2.20. Cougars have been documented as predators of lynx in the western United States, while fishers have been documented killing lynx in the northeast.

increase in hare numbers with approximately 4-fold increases in their population sizes, followed by a 3–4-fold decrease during the decline phase of the cycle. In the Northwest Territories, Poole (1994) documented a 10-fold reduction in lynx density during the decline of hare populations. In south-central Yukon, Slough and Mowat (1996) found that lynx numbers fluctuated 10–17-fold over the cycle.

Lynx density, home range size, dispersal patterns, reproductive parameters, and survival rates are strongly correlated to snowshoe hare abundance (Nellis et al. 1972, Brand and Keith 1979, Ward and Krebs 1985, Poole 1994). When hares reach their peak abundance in the cycle, the lynx population exhibits high productivity and recruitment, low mortality, and individuals use smaller home ranges. When hare populations decline, lynx exhibit lower productivity and higher mortality, and demonstrate increased movements and home-range sizes (Ward and Krebs 1985, O'Donoghue et al. 1997).

Evidence of lynx and snowshoe hare cyclicity in their southern distribution has been mixed, but population cycles and synchrony in both species appear to diminish with decreasing latitude (Keith 1963, Smith 1983, Keith 1990, Ranta et al. 1997, Hodges 2000b, Wirsing et al. 2002, Hodges et al. 2009, Scott 2009). Koehler (1990b) and Strohm and Tyson (2009) suggested that the natural patchiness of habitat in the southern portion of the range may contribute to a dampening of cyclic population dynamics of lynx and snowshoe hares.

In general, hares occur at lower densities in their southern range than in the north (Koehler and Aubry 1994). Peak densities reported in the north are 4–6 hares/ha (1.62–2.43 hares/ac; reported in Hodges 2000a). Hare densities in Maine range from 1.0–2.4/ha (0.6–0.97/ac; Robinson 2006, Fuller et al. 2007, Homyack et al. 2007, Vashon et al. 2008a, Scott 2009); Minnesota hare densities range from 0.3–2.0/ha (McCann 2006); and densities in the western United States range from <1.0–4.85/ha (<0.4–2.02/ac; Koehler 1990b, Hodges 2000b, Lewis et al. 2011, Berg and Gese 2012).

Genetic variation across the range of lynx

Periodically, influxes of dispersing lynx have occurred in the northern United States during lows in the snowshoe hare cycle in Canada (McKelvey et al. 2000b). Schwartz et al. (2002) used microsatellite DNA markers to estimate gene flow from lynx samples collected across the lynx's geographic range. The analysis revealed a high degree of gene flow despite separation by distances greater than 3,100 km (1,925 mi). This supported the hypothesis that immigrating lynx have been able to successfully colonize southern areas, and highlighted the need for management actions to maintain connectivity with the core of the lynx's geographic range in Canada.

Row et al. (2012) conducted a similar analysis of microsatellite DNA markers from lynx from Alaska to Newfoundland and came to a similar conclusion. They found low levels of population genetic structure in mainland North American lynx populations (Newfoundland populations were unique) suggesting high levels of dispersal. In contrast, Rueness et al. (2003) found significant genetic differentiation between the British Columbia and Alaska-Yukon-Northwest Territory regions and eastern Ontario-Quebec populations (possibly because different microsatellite loci were used). Despite these differences, Row et al. (2012) concluded that all these studies support the concept that the Rocky Mountains do not provide a strong barrier to gene flow for lynx although there may be subtle restrictions in gene flow between eastern and western North American populations.

Schwartz et al. (2003) compared genetic variation across the range of lynx. Using their operational definition (the outer 165 km [103 mi] band of the species' geographic range, based on home range size), they found less genetic variation in the periphery than in the center of the range.

Hybridization with bobcats

Canada lynx-bobcat hybridization was first documented in 3 of 20 lynx in northeastern Minnesota through genetic analysis of hair and scat samples (Schwartz et al. 2004). Lynx-bobcat hybrids were also detected in Maine (Plate 2.21; n=2) and New Brunswick (n=2) from samples collected from 1986 to 2003 (Homyack et al. 2008). All hybrids were the offspring of male bobcats and female lynx (Schwartz et al. 2004). Hybrids were capable of reproducing successfully based on observations of a hybrid female lynx with 3 kittens, and placental scars in the reproductive tract of another hybrid (Homyack et al. 2008).

Hybrids had ear tufts similar in length to lynx at >2.5 cm (>1 in) and their tails were black with a few white hairs interspersed. Hind feet of 2 hybrids were 17.5 and 20.0 cm (7 and 8 in) long, respectively (Homyack et al. 2008) and intermediate between those of a bobcat at 17.0 cm (6.7 in; Lariviere and Walton 1997) and a lynx at 20.3 cm (8 in; Tumlison 1987). The pelage of the hybrids tended to be reddish brown with a few spots and generally more like bobcats in appearance (Homyack et al. 2008).

To date, hybridization has been documented only in Minnesota, Maine, and New Brunswick where low topographic relief and variability in winter severity may allow more interaction between the 2 species during the breeding season. There was no evidence of hybridization in the 120 lynx studied in Montana (J. Squires personal communication 2012). Further research is needed to identify areas where lynx-bobcat hybridization is occurring, to determine the factors in lynx habitat that favor bobcats, and to assess whether hybridization may hinder lynx recovery (Schwartz et al. 2004).



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Plate 2.21. Lynx and bobcat hybridization has been documented in Minnesota, Maine, and New Brunswick. Note that on this lynx-bobcat hybrid, the tail is not completely black-tipped, the front foot is smaller than that of a lynx, and the fur is more spotted as seen on the leg.

Interspecific relationships with other carnivores

Predation on lynx. Mountain lion predation was a source of 3% of the confirmed mortality observed among lynx reintroduced in Colorado (Devineau et al. 2010) and also was observed in lynx populations in Montana (J. Squires, personal communication 2012) and Washington (Koehler 1990a). As noted above, documented predators of lynx include mountain lion, coyote, wolverine, gray wolf, fisher and other lynx. The

magnitude of predation on lynx and the extent to which it may influence lynx population structure and dynamics are unknown.

Competition – dietary overlap. Buskirk et al. (2000a) defined 2 possible competition impacts to lynx as exploitation (competition for food) and interference (avoidance). Exploitation competition could contribute to lynx starvation and reduced recruitment. Of several predators examined (raptors, coyote, gray wolf, mountain lion, bobcat, and wolverine), coyotes were deemed the most likely to pose local or regionally important exploitation impacts to lynx. Coyotes, bobcats, and mountain lions are possibly capable of imparting interference competition effects on lynx. Interference would be most probable during summer, and during winter in areas lacking deep, unconsolidated snow.

Parker et al. (1983) discussed anecdotal evidence of competition between bobcats and lynx. On Cape Breton Island, Nova Scotia, lynx were common over much of the island prior to bobcat colonization. Following colonization by bobcats, lynx densities declined and their presence on the island became restricted to the highlands where bobcats did not occur.

Robinson (2006) documented that the absence of bobcats was a significant factor along with hare density in explaining the distribution of lynx occurrence in Maine. In townships where both species were present, lynx used suboptimal habitats and bobcats were found in the areas having the highest hare densities. Lynx have a lower foot loading and longer limb length than bobcats (Buskirk 2000, Hoving et al. 2003) and likely have a competitive advantage in deep, fluffy snow conditions. Bobcats in Maine are physically stressed during harsh winters that have deep snow, and these conditions likely limit their northern distribution (Litvaitis et al. 1986).

Chapter 3 - LYNX GEOGRAPHIC AREAS

Five geographic areas are identified: Northeast, Great Lakes, Southern Rocky Mountains, Northern Rocky Mountains, and Cascade Mountains. These geographic areas were delineated in the 2000 LCAS based on lynx occurrence records and the distribution of appropriate forest vegetation (e.g., spruce-fir forests).

In 2005, FWS developed a Canada Lynx Recovery Outline (U.S. Fish and Wildlife Service 2005), which provides preliminary recovery objectives and actions for the contiguous United States DPS of lynx until a recovery plan is completed. Based on the examination of historical and recent evidence of lynx habitat and occurrence, the recovery outline identified core areas, secondary areas, and peripheral areas (Fig. 3.1). Core areas are the areas with the strongest long-term evidence of the persistence of lynx populations supported by a sufficient quality and quantity of habitat. The recovery outline recommends focusing lynx conservation efforts on core areas to ensure the continued persistence of lynx in the contiguous United States. FWS hypothesized that secondary areas and peripheral areas may contribute to lynx persistence by enabling successful dispersal and recolonization of core areas, but their role in sustaining lynx populations remains unknown.

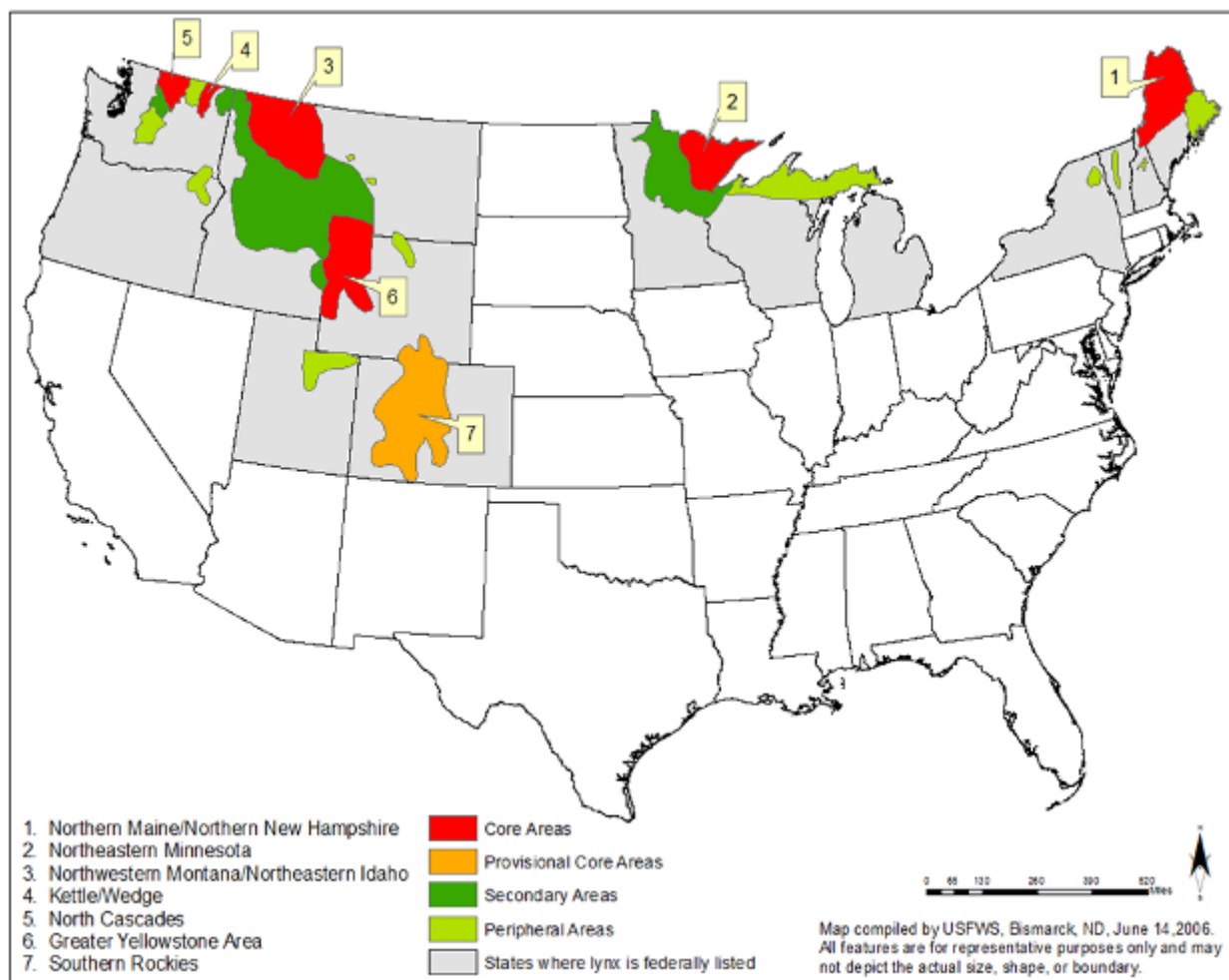


Figure 3.1. Areas identified as core, secondary, and peripheral as depicted in the Canada Lynx Recovery Outline across the states where the lynx is listed (U.S. Fish and Wildlife Service 2005).

The recovery outline (U.S. Fish and Wildlife Service 2005) identified 6 core areas: Northern Maine/Northern New Hampshire, Northeastern Minnesota, Northwestern Montana/Northeastern Idaho, Kettle/Wedge, North Cascades, and Greater Yellowstone Area. The Southern Rockies was identified as a “provisional core” because it contains a reintroduced population, and at that time it was too early to determine whether a self-sustaining population of lynx would result. In this document, the provisional core is treated the same as the core areas.

All of the core areas, secondary areas, and peripheral areas identified in the recovery outline (U.S. Fish and Wildlife Service 2005) are encompassed within the 5 geographic areas (Fig. 3.1). As new information continues to be developed, the delineations may be modified. For example, the Southern Rocky Mountains Geographic Area was not subdivided into core, secondary, and peripheral areas in the recovery outline. As the pattern of occupancy by the reintroduced population becomes clearer over time, it is possible that some further subdivision may occur. Our intent is that LCAS geographic areas will be adjusted if needed to encompass the areas identified in the recovery outline or in a future recovery plan.

A crosswalk between geographic areas and the core areas is shown in Table 3.1. The table also includes an estimate of the size of each core area taken from the rule designating critical habitat (Federal Register vol. 74, no. 36, pp. 8616-8702), the Southern Rockies Lynx Amendment (USDA Forest Service 2008), and the Washington Lynx Recovery Plan (Stinson 2001).

Table 3.1. Cross-walk between geographic areas and core areas and estimated size of core areas.

| Geographic Area Name | Core Area Name | Core Area Size km² (mi²) |
|-----------------------------|---|---|
| Northeast | Northern Maine/Northern New Hampshire | 24,597 km ² (9,497 mi ²) |
| Great Lakes | Northeastern Minnesota | 20,888 km ² (8,065 mi ²) |
| Southern Rocky Mountains | Southern Rockies | 27,328 km ² (10,551 mi ²) |
| Northern Rocky Mountains | Northwestern Montana/Northeastern Idaho Greater Yellowstone Area Kettle/Wedge | 36,096 km ² (13,937 mi ²) 13,492 km ² (5,209 mi ²) 1,167 km ² (451 mi ²) |
| Cascade Mountains | North Cascades | 4,755 km ² (1,836 mi ²) |

The geographic areas vary in important ways that may influence lynx populations and their prey. In this chapter, we address the population status and distribution of lynx and features of their habitat, as well as the distribution and habitat of snowshoe hares, in each geographic area. For each area, we discuss connectivity of lynx populations and their habitat, and the potential influence of relevant human activities and developments that are occurring or are likely to occur. Potential changes in habitat conditions due to climate change are also described, in order to assess the relative capability and importance of areas within the geographic area to sustain lynx populations into the future.

Northeast Geographic Area

Geographic extent

The Northeast Geographic Area boundary encompasses Maine, northern New Hampshire, northern Vermont, and northeastern New York. The previous delineation in 2000 also included much of New Hampshire and Vermont, small portions of northwestern Massachusetts, and the very northeastern corner of Pennsylvania. Based on more recent information including documented records of reproduction by lynx, these more southern areas are no longer included in the geographic area.

This geographic area falls within the Adirondack-New England Mixed Forest-Coniferous Forest-Alpine Meadow Province (McNab and Avers 1994). The province is composed of 5 sections, as described by McNab and Avers (1994). Current information indicates that lynx inhabit only the White Mountains Section.

White Mountains Section (M212A): This section extends across the western one-half of Maine from north to south and the northeastern corners of New Hampshire and Vermont. The potential vegetation types occurring on this section include northern hardwood forest, northern hardwood-spruce forest, and northeastern spruce-fir forest (Kuchler 1964).

The Acadian forest ecoregion is an ecological transition zone between northern boreal forests and southern temperate deciduous-dominated forests (Seymour and Hunter 1992). The province is composed of subdued glaciated mountains and dissected plateaus of mountainous topography. Elevations range from 150–1,220 m (500–4,000 ft) with a few isolated peaks higher than 1,525 m (5,000 ft). Any glacially broadened valleys have glacial outwash deposits and contain numerous swamps and lakes.

The climate in the area is characterized by warm summers. Winters can be cold; mean temperatures in January in western Maine are -17° C (+1° F; Homyack et al. 2006), but it is less cold near the ocean. Average annual snowfall is more than 250 cm (100 in) with a steep gradient of snowfall increasing from the coast to the interior forest in northwest Maine (Jacobson et al. 2009).

Tree species composition and growth form are similar to the forests found to the north in Canada, but red spruce tends to replace white spruce. Valleys contain hardwood forests with the principal tree species being sugar maple, yellow birch (*Betula alleghaniensis*), and beech, with a mixture of hemlock. Low mountain slopes support a mixed forest of spruce, fir, maple, beech, and birch. Above the mixed-forest zone lie pure stands of balsam fir and red spruce. Alpine meadows exist above timberline (Bailey 1995).

Lynx population status and distribution

Historical records of lynx exist from Maine, New Hampshire, Vermont, and New York; however, with the exception of Maine, recent records of lynx from the Northeast are rare (McKelvey et al. 2000b, Hoving et al. 2003, Krohn and Hoving 2010). Lynx are currently considered present in Maine, the White Mountains of New Hampshire, and the Green Mountains of Vermont. Modeling based on lynx occurrence data concluded that areas in the northeastern United States that receive <270 cm (<106 in) of snowfall or are dominated by deciduous forests are unlikely to support lynx (Hoving et al. 2005).

Anecdotal reports suggest that lynx were breeding in Maine during the 1960s and 1970s (McKelvey et al. 2000b, Hoving et al. 2003, Vashon et al. 2012). Lynx snow tracking surveys, using a detection protocol established by the Maine Department of Inland Fisheries and Wildlife, were conducted in Maine from 1995–1999 across 126 townships and from 2003–2008 across 60 townships to determine the presence of lynx on private forest lands. Lynx were detected in 10 townships in 1995–1999 and 35 townships in 2003–2008 (Vashon et al. 2012). Data from these surveys were used to model lynx occurrence and habitat in northern Maine (Hoving 2001, Simons 2009), which predicted lynx habitat to be widespread and relatively abundant throughout northern Maine. Lynx reproduction was confirmed in 1999 when a radio-collared female produced 2 kittens (Vashon et al. 2012). During a period of high hare populations (>2hares/ha [0.8 hares/ac]), 89% percent of available adult females (older than 2 years) produced litters, and litter size averaged 2.74 kittens (Vashon et al. 2012). Lynx are state-listed as a species of special concern in Maine.

Regional modeling based on vegetation and annual snowfall indicates that Acadian forest habitat in New Hampshire, Vermont, and New York is no longer contiguous with existing lynx populations in Maine, New Brunswick, and the Gaspé Peninsula of Quebec (Hoving et al. 2005). In New Hampshire, the lack of lynx captures by trappers or of vehicle-related mortalities since 1967, and the subsequent failure to detect lynx tracks during an extensive survey of the White Mountain National Forest in 1986 are considered evidence that a viable population of lynx no longer exists there (Litvaitis et al. 1991). However, small numbers of breeding lynx were discovered in northern New Hampshire and Vermont in 2007 and have persisted through 2011 (M. McCollough, U.S. Fish and Wildlife Service, personal communication 2013). Lynx are state-listed as endangered in Vermont and New Hampshire. The lynx is considered extirpated in New York.

Lynx populations in Maine are contiguous with lynx populations in the Gaspé region of southern Quebec and northern New Brunswick, Canada. Lynx also occur on Cape Breton Island, Nova Scotia. It is thought that dispersing lynx from the north may periodically supplement resident populations in the United States (Litvaitis et al. 1991, Hoving et al. 2003, Vashon et al. 2012).

In Quebec, populations are trapped according to a management strategy implemented in 1995 (Ministère de l'Environnement et de la Faune 1995). Southern Quebec is divided into Fur Management Units. Harvest limits vary from 1–4 lynx in most units adjacent to northern Maine and New Brunswick. The lynx population density is estimated to be 10 lynx/100 km² (3.86 lynx/100 mi²) at the peak of the hare cycle, 2 lynx/100 km² (0.77 lynx/100 mi²) at the trough, and 4–6 lynx/100 km² (1.5 lynx–2.3/100 mi²) on average (Ray et al. 2002). Harvest limits are adjusted according to hare populations. Annual harvest in the entire province of Quebec from 2004–2011 ranged from 1,734 to 3,155 lynx. The annual harvest in southern Quebec Fur Management Units (south of the St. Lawrence River and adjacent to the United States) during the same time period ranged from 339 to 744 lynx.

Lynx are listed as endangered by the provinces of New Brunswick and Nova Scotia; there is no harvest and no estimate of population density or abundance in these provinces at this time. Lynx are considered extirpated from the Upper St. Lawrence Valley (Alvo 1998).

Lynx habitat

Lynx habitat within the Northeast Geographic Area is distributed in a mostly contiguous block of forest in the Acadian forest ecotone between boreal forest and deciduous forest, primarily associated with northern spruce-fir forest and northern hardwood-spruce forest communities. This habitat is similar to, and contiguous with, forested areas in Quebec and New Brunswick, Canada (Hoving et al. 2005).

The current range of lynx in the Northeast is most strongly associated with areas of deep snowfall (Hoving et al. 2004), large (100 km² [40 mi²]) forested landscapes, and areas with a high proportion of regenerating conifer-dominated forest that had previously been treated with herbicides to suppress hardwoods (Hoving 2001). The majority of current lynx populations and lynx habitat in the Northeast Geographic Area are located on private industrial forest lands in Maine (Harper et al. 1990, Hoving et al. 2004, Simons 2009, Federal Register Vol. 74 pp. 8616–8701).

In the northeast prior to European settlement, lynx habitat was created and maintained by small-scale, frequent forest gap dynamic events and large-scale, infrequent (stand-replacing) forest disturbances (Seymour et al. 2002, Lorimer and White 2003). Higher elevation forests are often characterized by an even-aged wind-throw phenomenon known as fir-waves (Sprugel 1976). The extent of these areas is limited and little is known about hare densities and lynx use within them. Large, stand-replacing events (fire, wind and ice storms, insect

outbreaks) are rare (interval of several hundred to several thousand years) and highly variable in size (Seymour et al. 2002, Lorimer and White 2003). Spruce budworm, spruce beetle, beech bark disease, and sugar maple defoliators have been important influences affecting forest landscape patterns (McNab and Avers 1994). The frequency and intensity of spruce budworm outbreaks, the most likely insect to affect lynx habitat, have been highly variable in Maine and eastern Canada in recent centuries (Blais 1983). In this geographic area, wildfire is less significant as a natural agent of disturbance. The typical fire regime is infrequent surface fires in the dormant season in the hardwood forests, and slightly more frequent but long-interval fires in conifer forests (Kilgore and Heinselman 1990, Seymour et al. 2002, Lorimer and White 2003). For the past several decades, early successional forests in northern Maine, New Brunswick, and southern Quebec have been created almost exclusively by forest management (Lorimer and White 2003).

Large-scale, intensive forest management in Maine created the regenerating softwood-dominated habitat conditions that have recently been favorable for lynx (Hoving et al. 2005). Forested habitats in New Hampshire, Vermont, and New York are highly fragmented and are believed to lack the conifer component needed to produce high enough snowshoe hare densities to support viable populations of lynx (Hoving et al. 2005).

In general, landscape scale and home range scale habitat selection by lynx on industrial forest lands reinforce the importance of dense regenerating conifer forest along with a component of mature conifers (Hoving et al. 2004, Vashon et al. 2008a, Simons 2009, Simons-Legaard et al. 2013). Simons-Legaard et al. (2013) found the probability of lynx occurrence was >90% when snowshoe hare landscape densities were >0.74 hares/ha (0.39/ac) and there was >10% mature conifer forest. In Maine, lynx selected softwood-dominated (spruce and fir) regenerating stands (Fuller et al. 2007; Vashon et al. 2008a, b) and adjacent older (11–21 years post-harvest) partial-harvested stands (Fuller et al. 2007). Lynx were more likely to occur in landscapes with regenerating forest, and less likely to occur in landscapes with recent clearcut or partial harvest (Hoving et al. 2004). Regenerating stands used by lynx typically developed 15–30 years after harvest (Hoving et al. 2004), and were characterized by high stem density and dense horizontal cover within 1 m (3 ft) of the ground (Robinson 2006, Scott 2009, Fuller and Harrison 2010). These habitats supported high snowshoe hare densities (Homyack 2003, Fuller and Harrison 2005, Vashon et al. 2008a). At a landscape scale, lynx habitat selection did not differ between sexes; however, at a home range scale, males tended to use more mature forest dominated by conifers than females, and both male and female lynx tended to avoid mature forests that had a high deciduous component (Vashon et al. 2008a). The mean landscape density of hares in occupied lynx areas in northern Maine was 0.74 hares/ha (Simons-Legaard et al. 2013).

During winter, lynx primarily selected tall (4.4–7.3 m [14.5–24 ft]) regenerating clear-cuts and partially harvested stands that were 11–21 years post-harvest (Fuller et al. 2007). Lynx avoided mature stands (>40 years old) and short (3.4–4.3 m [11–14 ft]) regenerating clear-cut or partial harvested stands <10 years post-harvest (Fuller et al. 2007). Further research of year-round habitat use yielded similar results, with lynx preferentially using conifer-dominated sapling stands that were 3.4–7.3 m (11–24 ft) in height and supported high densities of snowshoe hares (Vashon et al. 2008b). Lynx tended to forage in areas with intermediate to high snowshoe hare densities (tall regenerating or older partial harvest stands), which afforded lynx with greater mobility and where snowshoe hares were more vulnerable to predation, rather than in the densest stands (short regenerating stands; Fuller and Harrison 2010).

Denning habitat was provided by blowdown, deadfalls, and root wads. In northern Maine, the majority of natal dens (12 of 26) occurred in conifer-dominated sapling stands, and 6 dens were found in mature or mixed multi-story forest stands dominated by conifers (Organ et al. 2008).

Forest management created Maine's current lynx habitat (Hoving et al. 2004, Scott 2009). Natural stand-replacing disturbances are rare and infrequent and, other than spruce budworm outbreaks, are unlikely to significantly affect future habitat conditions (Hoving et al. 2004). Current habitat was created by extensive softwood regeneration created by salvage harvest (clearcutting) on private land in the 1970s and 1980s; a portion of these units were subsequently sprayed with herbicide to reduce deciduous competition (Scott 2009). The resulting vegetation was dominated by balsam fir and red or black spruce (Scott 2009). Over 95% of cutting that occurs now in northern Maine in 2005 is partial harvesting (selective cutting, patch cuts) compared to only 59% in 1988 due to implementation of the Maine Forest Practices Act (Scott 2009, Simons 2009, Simons-Legaard et al. 2013). This new cutting regime supports lower densities of snowshoe hares (Fuller 1999, Homyack 2003, Robinson 2006, Scott 2009) and is projected to result in a reduced population of lynx in Maine (Simons 2009).

Connectivity of lynx populations and habitat

The current distribution of lynx in the Northeast Geographic Area (northern Maine) is continuous with large areas of lynx habitat in Canada (Hoving et al. 2005, Carroll 2007). Maintaining connectivity with occupied lynx habitats in Canada may be critical to maintaining viable populations of lynx in the northeastern United States (Hoving et al. 2005). International cooperation to this end will be essential to the long-term conservation of the species in the United States.

Snowshoe hare population distribution and habitat

Snowshoe hares were historically resident in Maine, New Hampshire, Vermont, New York, Massachusetts, and Pennsylvania. Only in Maine, northern New Hampshire, and northern Vermont are snow depth and quality, adequate conifer-dominated forest, and densities of snowshoe hares likely to be sufficient to support lynx.

Hare density estimates in Maine vary according to stand composition, age, and the silvicultural practices that created the stand. Throughout Maine, snowshoe hare densities are associated with dense regenerating stands (Monthey 1986, Fuller 1999, Hoving 2001, Robinson 2006, Scott 2009) with understory density being more important than vegetation composition (Litvaitis et al. 1985). Litvaitis et al. (1985) reported that dense softwood understories supported a greater density of hares than hardwood stands, due to their superior cover from predators and climatic extremes.

Average hare densities in forest stands (during a period of high hare population) range from 0.25 hares/ha (0.1 hare/ac) in mature softwood and conifer forests to 2.0 hares/ha (0.8 hares/ac) in conifer and mixed regenerating forest (Scott 2009). Hare densities were highly correlated with understory density (Litvaitis et al. 1985, Robinson 2006, Scott 2009). At their highest, snowshoe hare densities in Maine were similar to hare densities in the middle phases of the cycle in the northern boreal forest (Apps 2000, Hodges 2000a, Homyack et al. 2007, Scott 2009).

Hare populations fluctuate and may be cyclic in Maine. From 2006–2012, hare densities declined by about 50% in all regenerating conifer-dominated stands (24–39 years post-clearcutting) in northern Maine (D. Harrison, University of Maine, unpublished data). Synchronous declines occurred in Maine and the neighboring Gaspé region of Quebec from 2001–2006 (Assells et al. 2007, Scott 2009). The fluctuation in hare numbers in Maine and the adjacent Gaspé region of southern Quebec was not synchronous with the Temiscamingue region of southwestern Quebec, which peaked in 2002 followed by a low in 2005 (Assells et al. 2007). Hare populations in the Chaudiere-Appalaches region of Quebec, west of Maine, fluctuated in a cyclic pattern with very low amplitude (Godbout 1999).

Human activities and developments in the Northeast

Climate change is likely to affect the distribution and quality of lynx habitat in the northeastern United States and eastern Canada (Hoving 2001, Carroll 2007, Gonzales et al. 2007). In association with cooling during the Little Ice Age, spruce-fir forests proliferated in the last 500 years (Schauffler and Jacobson 2002). Warmer temperatures due to climate change could result in a contraction of the distribution of spruce-fir forests. Winter precipitation due to climate change is expected to increase 10–15% in Maine (Jacobson et al. 2009). However, the duration of snow cover as predicted under low emission scenarios could stay the same, or under high emission scenarios it could decrease by up to 50% (Hayhoe et al. 2007).

Vegetation management for timber production is the dominant land use within northern Maine and influences the amount and distribution of lynx habitat. Following a major spruce budworm outbreak, previous timber management practices that emphasized clearcutting produced the abundant, dense understory that is currently beneficial for lynx and snowshoe hares. However, with a shift to partial harvest forest management practices, lynx densities in northern Maine are projected to decline (Simons 2009, Simons-Legaard et al. 2013). There are no comprehensive agreements with the forest industry in Maine to manage lynx, although lynx forestry management guidelines (<http://www.fws.gov/mainefieldoffice/PDFs/Canada%20lynx%20habitat%20management%20guidelines%20for%20Maine%209.13.07.pdf>) are being used by several landowners enrolled in the Healthy Forest Reserve Program.

The lynx trapping season has been closed in the Northeast Geographic Area since the lynx was listed as a threatened species under the Endangered Species Act. Carroll (2007) modeled lynx populations in the Northeast and demonstrated that increased trapping pressure in Quebec could have a negative effect on protected lynx populations in Maine and New Brunswick. The Maine Department of Inland Fisheries and Wildlife is seeking an incidental take permit from FWS to provide coverage in case lynx are incidentally trapped during legal trapping of other furbearers or predators. Since 2000, 59 lynx are known to have been captured in traps set for other species and 6 of those were killed (Vashon et al. 2012).

Wind power development has increased in Maine since 2008. As of 2012, 1 project operates in lynx habitat, 3 others are in permit review, and 5–6 others are being considered. Although effects on lynx are unknown, wind development may fragment and reduce lynx habitat, increase road density and human activity, and create noise. Construction of associated transmission lines may temporarily affect habitat.

Great Lakes Geographic Area

Geographic extent

The Great Lakes Geographic Area encompasses northeastern and north-central Minnesota, northern Wisconsin, and the Upper Peninsula of Michigan. The Great Lakes Geographic Area is located in a southern extension of the Canadian Shield boreal forest region described by Larsen (1980), and falls within the southern boreal-northern hardwood forest border (Pastor and Mladenoff 1992). A direct connection with lynx habitat in Canada is important to maintain emigration of lynx out of and immigration of lynx into this geographic area.

The Great Lakes Geographic Area largely falls within the Laurentian Mixed Forest Province (McNab et al. 2005). This is a highly diverse geographic area both in terms of landform and vegetation mix. Most of the province is characterized by low-relief hilly landscapes with glacial features such as lakes, poorly drained depressions, bogs, moraine hills, drumlins, eskers, and outwash plains. Elevations range from sea level to 730 m (2,400 ft). Compared with lynx habitat elsewhere in the United States, the Great Lakes Geographic Area has much

more water in the form of lakes, rivers, ponds and wetlands interspersed through the upland forested areas. Rock outcrops are common.

Forest vegetation is transitional between the boreal forests of Canada and northern Minnesota and the broad-leaf deciduous forests of Wisconsin and Michigan. Forested stands vary from mixtures of conifers to pure stands of conifer or hardwood species (Bailey 1995). Fire and windthrow are the major natural disturbance processes in boreal forests and northern hardwood forests, respectively.

Climate in the area is characterized by moderately long and somewhat severe winters, with snowfall remaining on the ground all winter. Large lake influences produce more snow along Lake Superior. Although snow is present all winter, this region receives the majority of its precipitation in the summer.

Lynx population status and distribution

The lynx population in the Great Lakes Geographic Area is an extension of the larger population of lynx in Ontario, Canada. Northeastern Minnesota contains the core lynx population and habitat in this geographic area. Outside of this portion of Minnesota, lynx appear to be occasional visitors (transients). Suitable habitat is limited in northern Wisconsin and the Upper Peninsula of Michigan and there is no current evidence of reproduction in either area.

Historical evidence shows that lynx populations in the Great Lakes area, particularly Minnesota, were regularly supplemented by dispersing lynx from Canada (Harger 1965). Many lynx records, particularly from the 1960s and 1970s, are highly correlated with lynx population peaks in Canada (McKelvey et al. 2000b).

Minnesota: The lynx population in Minnesota is geographically restricted. Most recent and historical records are from the northeastern part of the state, especially in the Northern Superior Uplands Ecological Section. Currently, a breeding population of lynx exists in northeastern Minnesota. It appears that Minnesota supports a resident population of lynx, and that periodic invasions from adjacent Canadian provinces occur when the snowshoe hare population crashes (Moen 2009). Radiotelemetry has documented lynx movements between Minnesota and Ontario (Moen et al. 2008, Moen et al. 2010b).

Reproduction and maintenance of home ranges by lynx were first documented in the early 1970s (Mech 1973, 1980). From 2003–2008, reproduction by radiocollared lynx was documented and 10 dens were located (Moen et al. 2008). Few kittens born in Minnesota have been recruited into the adult population, but this is balanced by movement of lynx into Minnesota from Ontario. Emigration to Ontario also occurred, with 6 of 35 lynx radiocollared in Minnesota dying in Ontario, and several others with a last-known location in Ontario (Moen 2009).

In Minnesota, there is a long record of lynx harvest, with annual harvests exceeding that of any other state (Henderson 1978, Erb 2012). The average harvest in Minnesota from 1929–1969 of 177 lynx per year is at least 40 times higher than the average reported harvest or the verified records of every other state south of Canada except Montana (Moen 2009). Harvest data between 1930–1976 (before the cessation of legal trapping) show that lynx harvest ranged from 0–400 animals per year (Henderson 1978). Only 3 verified lynx records are known from the early 1990s after the closure of the legal trapping season (McKelvey et al. 2000b). Between 2000–2006, there were 63 verified and 161 probable reports of lynx (Minnesota Department of Natural Resources 2006). Genetic analyses of scat and hair samples collected between 2000–2009 along lynx snow trails and from tissue samples confirmed the presence of 104 unique lynx genotypes (Catton and Loch 2010).

Over the last decade there have been 3 lynx sightings confirmed through DNA analysis in Voyageurs National Park (Moen et al. 2012). There were no detections of lynx in Voyageurs National Park through the National Lynx Survey (Route et al. 2009), or with surveys using remote cameras or snow-tracking (Moen et al. 2012). Snowshoe hare pellet counts in and near Voyageurs National Park indicated a snowshoe hare population too low to support a viable population of lynx (Moen and Windels 2009, Moen et al. 2012). Despite the low prey populations, 1 female lynx was observed with a kitten in 2010, but was the only probable resident lynx confirmed near Voyageurs National Park from 2001 to 2010. There were no lynx detected during snow tracking surveys west of Highway 53 in northern Minnesota in 2006 (Moen et al. 2006).

Snow depth and quality of snowpack are thought to separate the distributions of lynx and bobcat within the Great Lakes Geographic Area. Hybridization between lynx and bobcat has been documented in Minnesota (Schwartz et al. 2002).

Wisconsin: There are few verified reports of lynx in Wisconsin. McKelvey et al. (2000b) found 29 reports of lynx between 1870–1992, 16 of which were associated with unprecedented cyclic highs that occurred throughout Canada in the early 1960s and 1970s. Between 2000–2003, no lynx were detected during extensive snow tracking surveys in potential lynx habitat in northern Wisconsin (S. Hassett, personal communication 2003). There are no records of lynx breeding in Wisconsin. Lynx found in Wisconsin are likely dispersers and not resident animals (U.S. Fish and Wildlife Service 2005).

Michigan (Upper Peninsula): McKelvey et al. (2000b) located 38 verified records of lynx from the mid-1800s to 1983. Beyer et al. (2001) documented 39 verified records of lynx between 1940 and 1997; 27 of these records correlate with an extreme cyclic high in Canada in the early 1960s. There is no evidence of lynx breeding in Michigan. Lake Superior nearly isolates the Upper Peninsula of Michigan from source populations in Canada, limiting the potential to successfully establish a population via immigration (U.S. Fish and Wildlife Service 2005). Beyer et al. (2001) concluded a resident lynx population does not occur in the Upper Peninsula and that dispersers occur only occasionally.

Ontario: Trapping in Ontario, adjacent to the Great Lakes Geographic Area, occurs on registered traplines. The open season for lynx is from 25 October until the last day of February.

Lynx habitat

Lynx habitat in the Great Lakes Geographic Area is embedded within the ecotone between boreal and mixed deciduous forests. This landscape contains a mix of upland conifer and hardwood interspersed with lowland conifer, shrub swamps and bogs. Conifer species include white and black spruce; balsam fir; northern white cedar; jack, white, and red pine; hemlock, and tamarack. Deciduous species include aspen, paper birch, and mixtures of northern hardwoods and lowland hardwoods. Of the non-forested types, shrub swamps and bogs are generally considered lynx habitat. Shrub swamps consist mainly of alder or willow. Bogs typically have components of black spruce, tamarack or other lowland conifers. Northeastern Minnesota contains by far the most suitable lynx habitat in the geographic area. Northern Wisconsin and the upper peninsula of Michigan contain only small patches of habitat and large areas that are not lynx habitat.

McKelvey et al. (2000b) found that most historical occurrences (88%) of lynx in the Great Lakes Geographic Area fell within the Mixed Deciduous/Conifer Forest province. Most (66%) of the lynx locations from a telemetry study in Minnesota were in areas classified as either lowland conifer, upland conifer, or regenerating forest (Moen et al. 2008). A conifer component in forest stands appears to be a critical factor for suitability of lynx habitat in this geographic area. Large stands of pure northern hardwoods are not considered suitable.

Fire, wind, and insects are the primary natural disturbance factors that maintain forest composition and successional patterns in this landscape. Three distinct fires regimes were found by Kilgore and Heinselman (1990) in pre-settlement forests:

- Jack pine and spruce-fir forest sustained very large (>101,171 ha [$>250,000$ ac]) stand-replacement crown fires or severe surface fires at 50–250 year intervals;
- Red pine and white pine forests have combinations of moderate intensity surface fires at 20–40 year intervals, with more intense crown fires at 150–300 year intervals; and
- Mixed aspen-birch-conifer forests have high-intensity surface or crown fires at 70–110 year intervals.

Larger blowdowns due to wind shear and tornadoes occur infrequently, but often cause extensive localized disturbance. Smaller, localized wind events created concentrations of downed logs, providing suitable denning habitat for lynx. Insect infestations such as those caused by spruce budworm contribute to large areas of tree mortality, and may create conditions conducive to subsequent large fires. These disturbance events create diverse, early-successional forests that provide habitats preferred by snowshoe hare, and thus important foraging areas for lynx.

Natural disturbances and timber harvest are important factors in maintaining the conifer understory component throughout much of this area.

Minnesota: The best lynx habitat is found in the Superior National Forest (including the Boundary Waters Canoe Area Wilderness) in Minnesota and Quetico Provincial Park in Ontario. Recent research in northeastern Minnesota indicated lynx selected for regenerating forest with a dominant conifer component and high densities of forest edges (Burdett 2008). Hare densities were highest in regenerating forests (McCann 2006, McCann and Moen 2011). Resting beds, kill sites, and hunting beds were found most often in regenerating and mixed forest while none were found in lowland conifer forests (Burdett 2008). Although lowland conifer did not appear to be important foraging habitat during winter, it was selected by females for denning habitat because of the forest structure that resulted from blowdown and fallen snags (Moen et al. 2008). Upland conifer and mature mixed-conifer/hardwood cover types were used as available on the landscape. Lynx habitat in the Great Lakes region may be managed by using timber harvest and fire to create early-successional forest, to maintain interspersed mature and lowland conifer forest for denning, and to create edge effects (Burdett 2008).

The lowland conifer cover types were used most often for denning in northern Minnesota (Moen et al. 2008), but other forest cover types were used if recent blowdowns were present (Moen and Burdett 2009). Female lynx with young kittens used a foraging radius of approximately 2–3 km (1.2–1.8 mi) around the den. Denning areas had significantly higher amounts of regenerating stands and upland conifer forest adjacent to the denning habitat (Moen et al. 2008).

Wisconsin and Michigan: As inferred from the historical record (McKelvey et al. 2000b), lynx are irregularly recorded in Wisconsin and Michigan's Upper Peninsula. Mapping of historical vegetation shows only small patches of boreal forest occur along the south shore of Lake Superior in extreme northern Wisconsin (S. Hassett, personal communication 2003; Wisconsin Department of Natural Resources, personal communication 2003). No lynx habitat is currently mapped on national forest system lands in Wisconsin. Habitat models of pre-settlement and current vegetation conditions in the Upper Peninsula of Michigan suggest that these areas lack the dense understory conditions favorable to snowshoe hares (Linden 2006), with low stem cover and resulting low hare densities across most forest stands (Linden et al. 2011). The few historical records from Michigan also indicate a low probability of supporting lynx populations (Beyer et al. 2001).

Connectivity of lynx populations and habitat

Habitat connectivity with Ontario is an important consideration for continued existence of a viable lynx population in the Great Lakes Geographic Area. Although lynx are capable of making long-distance dispersal movements (Mech 1980, Ward and Krebs 1985, Moen et al. 2010b), these movements are more likely to be made over land than across large lakes. Lake Superior interrupts the connectivity of habitat between the Upper Peninsula of Michigan and northern Wisconsin with lynx populations and habitat in Ontario. Over-land routes that exist around Lake Superior are a mix of forested areas and non-habitat such as urban development (e.g., Duluth and Sault Saint Marie) and the St. Louis and St. Mary's Rivers; and intersect several major highways including Highways 35, 53, and 61 in Minnesota; Highways 2 and 53 in Wisconsin; and Highway 75 in Michigan.

Habitat connectivity within and between portions of northeastern Minnesota and Canada appears functional based on movement data from radio-collared lynx in northeastern Minnesota from 2003–2009 (Moen et al. 2010b). Six of 12 lynx made long-distance movements through the Superior National Forest including the Boundary Waters Canoe Area and Wilderness into Ontario, Canada and then returned to Minnesota. Several other lynx have moved from Minnesota into Ontario after being radio-collared (Moen 2009). Three radio-collared lynx moved across northeastern Minnesota and Ontario, ending up near the northeastern corner of Lake Superior (Moen et al. 2010b).

Exploratory movements occurred throughout the year and were not strongly correlated to vegetation composition or topography. Males tended to leave their home ranges and then return, while females tended to disperse and establish a new home range (Moen et al. 2010b).

The current vegetation and forest structure in the Voyageurs National Park do not appear to support sufficient prey populations or provide the habitat necessary to support a population of lynx (Moen et al. 2012). However, certain areas within the Voyageurs National Park may provide sufficient prey resources to support transient lynx dispersing through the area.

Snowshoe hare population distribution and habitat

Snowshoe hare populations occupying the Great Lakes area historically showed density fluctuations based on pellet count data (Fuller and Heisey 1986), but these fluctuations have not been observed since the 1990s (Hodges 2000b). Snowshoe hare habitat in the Great Lakes Geographic Area primarily consists of conifer forests with dense low-growing understories, lowland shrub and conifer bogs, sapling, and older sawlog stands. Conifer bogs or lowland conifer forests may be especially important during low points in hare cycles by acting as refugia for hares. Early regenerating or pole-sized stands are not used as much as in other portions of their range, although older regeneration stands were used frequently in Minnesota (McCann 2006). However, sapling-sized aspen adjacent to conifer cover may provide functional snowshoe hare habitat.

Minnesota: McCann and Moen (2011) mapped the distribution of predicted snowshoe hare habitat across northeastern Minnesota. In northeastern Minnesota, edge habitats and regenerating conifer stands appeared to be important for snowshoe hare populations (Burdett 2008, McCann 2006), as were dense habitats containing balsam fir, white spruce, and cedar (Fuller and Heisey 1986). Pietz and Tester (1983) found that the presence of snow resulted in a decreased use of deciduous upland habitats. Hare density in parts of northeastern Minnesota appears to be sufficient to support a viable lynx population (Moen et al. 2008), ranging between 0.3–2.0 hares/ha (0.12–0.8 hares/ac; McCann 2006).

Wisconsin: In Wisconsin, snowshoe hare use red pine, jack pine, aspen, and dense black spruce and cedar bogs with sufficiently dense cover between 3–5 m (9–15 ft) in height (Buehler and Keith 1982, Sievert and Keith

1985). Winter foods consist of bark, twigs and tree buds from aspen, willow, birch, maple, sumac and alder. Populations occur primarily in the northern third of Wisconsin (Buehler and Keith 1982, Sievert and Keith 1985), with the distribution apparently limited by predator-caused mortality, which is influenced by conifer cover and snowfall (Buehler and Keith 1982). Sievert and Keith (1985) reported that predators killed 87% of the 67 radio-collared hares that died; survival was higher in areas where cover concealed hares or obstructed predators. Populations in Wisconsin are no longer believed to cycle due to loss of multi-story stands and forest maturity (Buehler and Keith 1982).

Michigan: In Michigan, Conroy et al. (1979) found that snowshoe hares preferred red maple and speckled alder in lowland habitats, but shifted to aspen and pine in upland habitats and clear cuts. However, lack of a dense understory in most parts of Michigan (especially the Upper Peninsula region) and low disturbance levels (limited timber management and wildland fires) indicate that conditions are not favorable to provide snowshoe hare populations adequate to support a viable lynx population (Beyer et al. 2001, Linden 2006). Isle Royale National Park, a 53,418-ha (132,000-ac) island located in Lake Superior, may contain suitable snowshoe hare densities to support lynx (Isle Royale Canada Lynx Feasibility Study Meeting, April 19, 2012, Ashland WI).

Human developments and activities in the Great Lakes

Most climate change simulations for the Great Lakes-St. Lawrence Basin predict reduced precipitation and lower lake levels (Inkley et al. 2004). Gonzalez et al. (2007) suggested the Superior National Forest in northern Minnesota may provide a refugium for lynx under various climate models, based on snow persistence and vegetation composition in this area.

The current composition and spatial distribution of early-successional and mature forests are considerably different from those formed by the natural disturbances that occurred prior to European settlement (Agee 2000). Timber harvest increased the proportion of early-successional forests, while fire suppression increased the distribution of balsam fir across the landscape. State and federal land management plans that govern management of lynx habitat emphasize maintaining and restoring boreal forest conditions and increasing the conifer component on the landscape.

Interest in biomass harvest (removal of small-diameter understory vegetation) in Minnesota, for energy as well as for fuels reduction, increased from 2000–2012. This is driven by higher energy prices and state-supported incentives to produce renewable energy (Minnesota Statutes chapter 216B, section 2424). Biomass harvest reduces horizontal cover important for snowshoe hares and lynx. However, with declining energy prices in the last few years, biomass harvest removal is not currently a significant factor affecting lynx habitat in Minnesota.

Lynx habitat in Minnesota is contiguous with habitats in southern Ontario, and radiocollared lynx successfully move back and forth across the border. Significant areas within historical lynx range in northern Wisconsin, central Minnesota, and upper Michigan have been converted to forest conditions that do not provide quality lynx habitat; however, this does not appear to create a barrier to lynx movements (Moen et al. 2010b).

Because this geographic area has relatively high forest road and highway densities that intersect lynx habitat, mortality due to vehicle collisions could be of concern. Several radiocollared lynx in Minnesota inhabited home ranges that were bisected by highways. Six lynx mortalities were documented on highways over the past 11 years in Minnesota (U.S. Fish and Wildlife Service 2012). These mortalities were located on the edges of lynx range in Minnesota. Deaths on roads due to motor vehicle collisions have occurred less frequently within the central lynx range and within the Superior National Forest.

Before the lynx harvest was closed in the 1980s in Minnesota, about half of the harvest was by trapping and half was from shooting (Henderson 1978). Currently, it is not legal to trap or shoot lynx within the Great Lakes Geographic Area because the species is protected under the Endangered Species Act. Emigration of lynx from Minnesota to Ontario may expose lynx to trapping and shooting that is allowed in accordance with regulated harvest in Canada. At least a third of the animals radiocollared in Minnesota spent time in Ontario; 4 radiocollared lynx were legally harvested (trapped) in Canada between 2003–2010 (U.S. Fish and Wildlife Service 2012).

The FWS in Minnesota maintains a database of known incidental lynx trapping, shooting, and other causes of death or injury (U.S. Fish and Wildlife Service 2012). Of the 23 known trapping incidents recorded since 2001, 13 resulted in lynx mortalities (U.S. Fish and Wildlife Service 2012). It is probable that there are additional incidental catches that are not reported each year (Moen 2009). The documented incidents largely occurred during trapping that targeted fox, bobcat, coyote, and marten, and involved a variety of traps including foot-holds, body gripping traps, and snares (U.S. Fish and Wildlife Service 2012). In response to a 2008 court ruling, the Minnesota Department of Natural Resources (MN DNR) drafted a plan to address incidental take of lynx that may result from otherwise legal trapping in the state. This plan, designed to reduce the likelihood of incidental take from trapping, is still under development by the MN DNR with review by the FWS.

Bobcat harvest in northeastern Minnesota has been increasing over the last decade (Erb 2012). Where lynx and bobcat overlap, there is potential for accidental shooting of lynx, or for bobcat hunting with dogs to harass or harm lynx. Since 2001, 6 lynx are known to have been shot and killed, 2 of which were radiocollared (U.S. Fish and Wildlife Service 2012).

Predator control activities occur in this area. Very limited agriculture occurs here; however, 1 farm is located within the center of lynx habitat in Minnesota where nuisance wolves were occasionally trapped as part of the animal damage control program. However, this particular farm is not likely to be a concern for lynx mortality.

Forest and backcountry roads, trails, and railroads may have both beneficial and negative impacts on lynx in this geographic area. Lynx use backcountry roads, trails, and railroads for travel, and presumably for hunting (Terwilliger and Moen 2012). Radiocollared lynx on average occurred about 300 m (984 ft) from a road or trail within their home range (Terwilliger and Moen 2012). When making long-distance movements to Ontario, lynx were located on average <200 m (656 ft) from a road or trail (Moen et al. 2010b). These linear pathways provide efficiency of movement and may support a higher density of prey; however, use of these routes also exposes lynx to risk of human-caused mortality. Since 2001, 1 lynx mortality due to a vehicle collision along a low-level gravel road and 2 lynx mortalities due to collisions with trains were documented (U.S. Fish and Wildlife Service 2012). Backcountry roads and trails also provide greater human access, which may increase the potential for incidental trapping and illegal shooting of lynx.

Mineral exploration and development is increasing in portions of the Great Lakes Geographic area, particularly for hard rock (non-ferrous) minerals. Some of the area of interest for minerals overlaps with lynx habitat in northeastern Minnesota and designated critical habitat. Mineral exploration may result in short-term displacement of lynx. Mining activities and associated development may result in an irreversible loss of habitat or increased mortality risk. The specific effects to lynx and their habitat will depend on the scale and type of each project.

Utility corridors (except in cases where utility corridors intersect backcountry roads) have little to no impact on lynx. Utility corridors located within lynx habitat tend to be for lower voltage power and phone lines.

Lynx are known to use utility corridors for travel and hunting.

Livestock grazing does not occur on public lands and grazing that occurs on private lands tends to be on small allotments and family farms that are generally not suitable lynx or hare habitat.

Southern Rocky Mountains Geographic Area

Geographic extent

The Southern Rocky Mountains Geographic Area encompasses the mountainous regions of Colorado, south-central Wyoming, and north-central New Mexico. The southern Rockies are separated from the rest of the Rocky Mountain chain by sagebrush and desert shrub communities in the Wyoming Basin and the Red Desert of southern and central Wyoming, and the arid Green and Colorado River plateaus of western Colorado and eastern Utah.

Throughout much of the Pleistocene epoch, the southern Rockies appear to have been connected with the rest of the Rocky Mountains through continuous forested habitats, across what are now open shrub-steppe communities (Armstrong 1975). Although the continental ice sheets of the Pleistocene never reached Colorado, the climate of the southern Rockies in that period was substantially cooler. Summer mean temperatures were estimated to be about 9° C (16° F) cooler, resulting in extensive alpine valley glaciation, high-altitude ice caps, and a lowering of the life zones 900–1,220 m (3,000–4,000 ft) below their current elevation limits. This would have lowered the spruce-fir/lodgepole pine forest to 1,500–2,150 m (5,000–7,000 ft) in elevation, encompassing much of the area between the southern Rockies and the rest of the Rocky Mountain chain (Armstrong 1975). During the last 15,000 years, the climate began a general trend of warming and drying, causing a northward retreat of the boreal forest and the raising of mountainous life zones to their current elevation limits (Armstrong 1972). It was during this interval that the southern Rockies became ecologically separated from the rest of the Rocky Mountains, isolating its remnant high-elevation boreal forests and the species characteristic of these forests (Armstrong 1975, Fitzgerald et al. 1994). The climate may have reached its thermal maximum 4,000–6,500 years ago (Oosting 1956). Based on pollen studies by Pennak (1963), mountainous vegetation communities appear to have remained relatively stable over the past 3,000 years.

The Southern Rocky Mountains Geographic Area falls within the Southern Rocky Mountain Province (Bailey et al. 1994, McNab and Avers 1994), and includes the following sections:

- Southern Parks and Mountain Ranges (M331F)
- South Central Highlands (M331G)
- North Central Highlands and Rocky Mountain (M331H)
- Northern Parks and Ranges (M331I)

Lynx population status and distribution

Historically, lynx appear to have been distributed sparsely in Colorado in areas above 2,700 m (9,000 ft) in the Park, Gore, San Juan, and La Plata Mountains and on the White River Plateau (Armstrong 1972). McKelvey et al. (2000b) reported 17 verified records of lynx from Colorado during the period 1878–1974. Verified records from southeastern Wyoming included a single specimen from 1865 in the Medicine Bow Range and one from the Laramie Range in 1963. Verified records after the 1920s are rare in Colorado and southern Wyoming, with most records coming from central Colorado. In 1973, 2 lynx were trapped on Vail Mountain in Eagle County, CO. A statewide lynx survey conducted from 1978–1980 by the Colorado Division of Wildlife, now known as Colorado Parks and Wildlife (CPW), concluded that a small lynx population persisted in Eagle, Pitkin, Lake, and Clear Creek Counties with evidence of lynx occurrence in Grand and Park Counties, based

on tracks and visual observations. However, the lynx population was thought to be too small to be self-sustaining.

In 1999, CPW initiated a program to reintroduce lynx from Canada and Alaska to re-establish a self-sustaining breeding population throughout the southern Rockies. A total of 218 animals were transplanted into the San Juan Mountains from 1999 to 2006 (Devineau et al. 2010). To evaluate the near-term success of the lynx reintroduction, CPW established benchmarks to track progress towards establishing a self-sustaining population in Colorado. In 2010, after completing more than a decade of monitoring, CPW announced that all of the following benchmarks for a successful lynx reintroduction had been met:

- Reintroduced lynx demonstrated a high rate of survival in the critical first months after release;
- Released adult lynx demonstrated low mortality rates over the longer term, particularly in good habitat;
- Lynx remained in good habitat at densities sufficient for breeding;
- Reintroduced lynx successfully reproduced;
- Lynx born in Colorado survived and also successfully reproduced (“recruitment” into the population); and
- On balance, lynx recruitment equaled or exceeded mortality over an extended period of time.

As of 2007, the average probability of survival for reintroduced lynx was 0.9315 ± 0.0325 within the study area in the San Juan Mountains and 0.8219 ± 0.0744 outside the study area boundary (Devineau et al. 2010). Although 30% of known mortalities were due to human causes (being shot or hit by a vehicle), the estimate of survival within the study area was higher than those reported for natural, lightly trapped populations of Canada lynx in the Yukon (0.75–0.90; Slough and Mowat 1996, O’Donoghue et al. 1997) or in the Northwest Territories (~0.90; Poole 1994). Successful reproduction, including by females born in Colorado, has been documented (Shenk 2008).

Plague, a flea-borne disease caused by the bacterium *Yersinia pestis*, which is not native to North America, was reported for the first time in lynx in Colorado (Wild et al. 2006). Pneumonic plague appeared to be the direct or indirect cause of death of 6 reintroduced lynx between 2000 and 2003. When translocated from Canada and Alaska, none of the lynx had antibody titers to *Y. pestis*; it appears likely that lynx were exposed to plague by infected prey after their release in Colorado.

Of the transplanted animals, a majority (152/218) remained within the study area in the San Juan Mountains of southern Colorado. Additional small population centers have been established in several locations farther north in Colorado. Based on radiotelemetry location data, lynx presence was verified on all national forests in Colorado, the Medicine Bow National Forest in Wyoming, and Rocky Mountain National Park (Shenk 2008).

Most individuals have been detected outside of the 20,684 km² (7,986 mi²) study area at least once. Some lynx dispersed widely over an area >1,000,000 km² (>386,103 mi²) in size, including Kansas, Iowa, Nebraska, South Dakota, Wyoming, Montana, Idaho, Utah, Nevada, Arizona, and New Mexico (Devineau et al. 2010).

New Mexico is not included in the list of states in the historical range of the species (Federal Register Vol. 65, No. 58, pp. 16052-16086). There are no verified historical records of occurrence of lynx in New Mexico (McKelvey et al. 2000b). However, high-elevation montane forest that is contiguous with occupied habitat in Colorado does occur in New Mexico (Shenk 2008). It is possible that lynx occurred in New Mexico historically but were extirpated prior to being documented by scientists (Frey 2004, 2006). On the other hand, an analysis of the Carson and Santa Fe National Forests and Valles Caldera National Preserve in New Mexico,

which evaluated potential vegetation, snow depth and persistence, records of lynx, occurrence of prey species, presence of competing predators, and the potential impacts of climate change, concluded that conditions in New Mexico are not adequate to maintain a self-sustaining population of lynx (USDA Forest Service 2009). In 2009, citing the movement of lynx from the reintroduced population in Colorado into northern New Mexico, the FWS determined that changing the boundary of the lynx listing to include New Mexico was warranted (Federal Register Vol. 74, p. 66937); the final decision is still pending.

Lynx habitat

Lynx habitat in the southern Rockies is found within the subalpine and upper montane forest zones. In the upper elevations of the subalpine zone, forests are typically dominated by subalpine fir and Engelmann spruce. As the subalpine zone transitions to the upper montane, spruce-fir forests begin to give way to lodgepole pine and aspen. On cooler, mesic mid-elevation sites, Engelmann spruce may retain dominance, intermixed with aspen, lodgepole pine, and Douglas-fir. Lodgepole pine reaches its southern limits in the central parts of the geographic area, while southwestern white fir occurs only in the San Juan Mountains. The lower montane zone is dominated by ponderosa pine and Douglas-fir, with pines typically dominating on lower, drier, more exposed sites, and Douglas-fir occurring on the more sheltered sites. Lower montane forests do not support snowshoe hares and seldom would be used by lynx.

Lynx habitat was mapped across federal lands in the southern Rockies based largely on current forest cover types. About 2.8 million ha (7 million ac) of lynx habitat was estimated to occur across the Southern Rockies Geographic Area (USDA Forest Service 2008).

Broad-scale lynx habitat use was documented from more than 9,400 daytime aerial telemetry locations by CPW from February 1999–June 2007. Shenk (2008) used these data to characterize lynx habitat use throughout the year. Mature Engelmann spruce/subalpine fir forests with total canopy cover of 42–65%, of which 15–20% was contributed by conifer understory tree canopies, were the most commonly used areas, followed by mixed forests of Engelmann spruce/subalpine fir/aspen. Riparian and riparian-mix was the third most-used cover type, with a pattern of increasing use beginning in July, peaking in November, and dropping off in December. Large or medium willow/alder carrs and willow riparian communities provided important habitat for snowshoe hare, grouse, ptarmigan (winter), and other prey species that could be utilized by lynx.

The telemetry data collected by CPW were re-analyzed to better predict the statewide distribution of lynx habitat. As a first step, Theobald and Shenk (2011) described the types of areas that were known to be used by reintroduced lynx from 1999–2010. Most of the data were collected in the core study areas in the San Juan Mountains of southwest Colorado and the Sawatch Range in the central part of the state. Ivan et al. (2012) extended the work of Theobald and Shenk (2011) by producing a statewide map of predicted lynx use. The telemetry data were not collected for the purpose of constructing a predictive map, and suffer from at least 2 shortcomings. First, the locations were not precise. Ivan et al. (2012) attempted to account for this imprecision by modeling at a 1.5 km (0.93 mi) scale, but matching covariates, response variables, and predictions at this scale reduces the clarity of relationships and weakens the model. Second, the bulk of the reintroduction research effort, from which these data originated, was conducted in the southern and central portions of Colorado. Lodgepole pine only occurs in the northern 2/3 of the state, and is dominant there. Thus, predicting lynx habitat use in northern Colorado is difficult because the landscape is very different, yet few data are available to predict lynx use of that landscape. Extrapolation beyond the range of covariates used to fit the models is tenuous, and caution must be exercised in interpreting results north of I-70.

Despite these limitations, the predictive maps have a distinct strength in that they were constructed objectively

from rigorous mathematical models based on empirical data collected from wild lynx. They are the first such maps for Colorado. Results from this effort confirmed some relationships that were already known (e.g., lynx are strongly associated with high-elevation spruce/fir and mixed spruce/fir forests but avoid lower-elevation montane forests and montane shrublands).

Site-scale descriptions of habitat use were obtained through snow-tracking of lynx (Shenk 2006). Habitat used by lynx for long beds, travel, and kill sites were found to have similar characteristics, typically occurring on gentle slopes (15.7°) with average elevation of 3,173 m (10,400 ft; Shenk 2009). Den sites were located at higher elevations (average of 3,354 m or 11,000 ft), on steeper slopes (average 30°) and on more northerly aspects than the other sites.

Fire has strongly influenced forest vegetation patterns in the southern Rockies. Natural fire regimes in subalpine fir-spruce forests of the southern Rocky Mountains are highly complex, reflecting great variation due to climate, topography, elevation, vegetation, and site productivity. Because of the high elevations and higher moisture gradients of the subalpine zone, stand replacement events occur infrequently on a given site, perhaps every 250–500 years. Such events occur with increasing frequency at lower elevations. Stand-replacing fires may occur every 100–150 years in the montane zone, while surface fires of low to moderate intensity occur relatively frequently (return intervals of 5–60 years). Insects, forest pathogens, avalanches and wind events are also important agents of disturbance.

The Southern Rockies Geographic Area is currently experiencing a major bark beetle epidemic in lodgepole pine and spruce-fir forests. Although bark beetles are native insects, and forests in the western United States have experienced regular insect infestations throughout their history, the current bark beetle epidemic is notable for its intensity and extensive geographic range. The causes of this epidemic include: relatively even-aged, dense, and homogenous forest conditions, which are highly susceptible to beetle attack, and which were created by large-scale logging in the late 1800s and subsequent fire suppression efforts; warmer winters due to climate change (cold winters typically reduce beetle populations); and a multi-year drought that occurred in the mid-1990s through early 2000s, stressing the trees and making them more susceptible to beetle attack (USDA Forest Service 2011).

In lodgepole pine forests, a mountain pine beetle (*Dendroctonus ponderosae*) epidemic typically kills the entire overstory and results in a stand-replacing disturbance event. In Colorado, more than 2,428,113 ha (6,000,000 ac), a portion of which overlaps with lynx habitat, has been affected by the current beetle epidemic (USDA Forest Service 2011). Even-aged mature and “dry” lodgepole pine stands characteristically have depauperate understory vegetation and are not capable of supporting dense populations of snowshoe hares. On moist sites, regeneration of beetle-killed lodgepole pine stands is expected to be rapid, and the new stands will be dominated by re-sprouting aspen or by a new cohort of lodgepole pine. If these newly-established stands grow tall and dense enough to provide horizontal cover above the snow layer, they may produce excellent habitat for snowshoe hares and lynx for several decades, until the crowns again lift above the reach of snowshoe hares.

A spruce beetle epidemic kills the larger-diameter trees and can also result in a stand-replacing disturbance event. Because of the importance of spruce-fir forests for production and survival of snowshoe hares (Ivan 2011a), widespread mortality of mature spruce/fir forests could impact lynx habitat for a long duration.

Connectivity of lynx populations and habitat

McKelvey et al. (2000c) stated that “fragmented forest cover types, high vagility of lynx, and linkages in popula-

tion dynamics suggest that lynx in the contiguous United States are arranged as metapopulations.” Colorado is separated from boreal forests in Wyoming by at least 100 km (62 mi; Halfpenny et al. 1979, McKelvey et al. 2000a) and likely functions as a metapopulation. A few of the lynx that were reintroduced into Colorado successfully travelled to the Northern Rockies Geographic Area, crossing through intervening desert and grassland habitats.

Connectivity of lynx habitat has been identified as an important consideration for the southern Rockies, because of the extreme topographic relief juxtaposed with human developments such as highways and residential communities. In the Remanded Rule (Federal Register Vol. 68, p. 400786), the FWS concluded that the population-level threat to lynx attributable to high traffic volume on roads that bisect suitable lynx habitat and associated suburban developments is low. However, the FWS recognized that a higher risk exists in Colorado than elsewhere in the range of the lynx.

In the Southern Rockies Lynx Amendment, 38 linkage areas were identified in Colorado and southern Wyoming. Management direction for these areas is to maintain connectivity of habitat and facilitate lynx movements. However, some of these linkage areas may be located in proximity to existing human developments or may not currently contain the conditions or structures needed to provide habitat connectivity.

Ski resort development, a growing and affluent population, and telecommuting capabilities have converged to spur rapid growth in some mountain valleys. Transportation corridors continue to be modified and expanded to handle increasing volumes of traffic and speeds, altering historical movement patterns of wide-ranging species and creating barriers to movement. These and other factors, both historical and current, have eliminated or degraded some landscape linkages, which increases the importance of remaining linkage areas.

Snowshoe hare population, distribution and habitat

Habitat that supports snowshoe hares is patchily distributed in the Southern Rocky Mountains Geographic Area, which limits their abundance. Zahratka and Shenk (2008) found densities of snowshoe hares to be greatest in mature Engelmann spruce-subalpine fir stands when compared to mature lodgepole pine stands in Taylor Park, Colorado. Their density estimates were 0.08 ± 0.03 to 1.32 ± 0.15 hares/ha (0.03–0.5 hares/ac) in Engelmann spruce-subalpine fir habitats, and 0.06 ± 0.01 to 0.34 ± 0.06 hares/ha (0.02–0.14 hares/ac) in lodgepole pine habitats (Zahratka and Shenk 2008).

Ivan (2011a) compared snowshoe hare density, survival, and recruitment in mature uneven-aged spruce/fir stands, small-diameter lodgepole pine (2.54–12.7 cm [1–5 in]) stands (20–25 years old), and medium-diameter (12.7–22.9 cm [5–9 in]) previously-thinned lodgepole pine stands (40–60 years old) in Colorado. During summer, Ivan (2011a) recorded densities of 0.2 ± 0.01 to 0.66 ± 0.07 hares/ha (0.08–0.27 hares/ac) in small lodgepole pine forest, 0.01 ± 0.04 to 0.03 ± 0.03 hares/ha (0.004–0.01 hares/ac) in medium lodgepole forest, and 0.01 ± 0.002 to 0.26 ± 0.08 hares/ha (0.004–0.1 hares/ac) in spruce/fir forest; densities were more similar across the 3 forest types during the winter months. He concluded that “hares reached their highest densities and recruited juveniles most consistently in stands of small lodgepole, followed closely by spruce/fir, but survival was highest in spruce/fir stands.”

Dolbeer and Clark (1975) estimated a density of 0.73 hares/ha (0.3 hares/ac) within study sites of Utah and Colorado, with the highest densities of snowshoe hare in mature and late-successional spruce-fir forests. Beauvais (1997) reported that snowshoe hares in Wyoming have a strong affinity for the higher-elevation mature to late-successional spruce-fir forests. Also in Wyoming, Berg et al. (2012) documented the highest snowshoe hare densities in late-successional, dense multi-story spruce-fir forests and 30–70 year old densely-

regenerating lodgepole pine forests.

In New Mexico, Malaney and Frey (2006) reported that snowshoe hares almost exclusively inhabit high-elevation, closed-canopy spruce-fir forests with dense horizontal cover.

Human activities and developments specific to the Southern Rockies

Climate change generally is expected to result in warmer winters, earlier spring snow melt, and a reduction in the extent of snow cover in the southern Rockies. McKelvey et al. (2011) used a variety of climate models to predict snow depth and the persistence of spring snow across the western United States. The models predicted an overall decline in persistent snow of 40%, but large areas of persistent snow would continue to be retained late in the 21st century, including the high elevations of Colorado.

Beginning in the 1860s through much of the latter half of the 19th century, large-scale alteration of the natural landscape resulted from the rush to extract the rich deposits of gold, silver, and other metals in portions of the southern Rockies. A huge demand for timbers, construction materials, and smelter and heating fuels resulted in extensive cutting of forests around mining centers. Human-induced and lightning-caused fires burned over large areas, and decades of phytotoxic smelter emissions killed or precluded the regeneration of forests around these centers. The effects of mining and large-scale logging are still evident today across much of the landscape. While many cut-over areas have recovered to varying degrees, some high-elevation forests still remain poorly timbered.

In 2008, all forest plans in the southern Rockies were amended to add objectives, standards, and guidelines to conserve the lynx while implementing a variety of resource management programs and activities (USDA Forest Service 2008).

As described previously, an extensive recent mountain pine beetle epidemic caused near-complete mortality of mature lodgepole pine forests in Colorado. Regeneration of beetle-killed stands is dominated primarily by lodgepole pine and aspen. Salvage harvesting of beetle-killed trees is occurring on a portion of the affected area.

Vehicular collisions are a potentially important cause of mortality for lynx in portions of the southern Rockies. Thirteen of the 102 mortalities documented for lynx translocated into Colorado were from vehicle collisions (Devineau et al. 2010). Brocke et al. (1990) suggested that translocated animals might be more vulnerable to highway mortality than resident lynx and this could have been a factor in Colorado. A number of highways with high speed and high traffic volume pass through lynx habitat, such as I-70, I-80, US 50, US 550 and US 160. These highways are not a barrier to lynx movement, as repeated successful crossings by radio-telemetered lynx have been documented on I-70 and Highways 9, 40, 50, 91, and 114 (Ivan 2011b, c, 2012; J. Squires, personal communication 2012).

As compared with other portions of the range of lynx, in Colorado more winter recreation and associated development overlaps with lynx habitat. Preliminary information from a study in Colorado indicates that some winter recreation uses may be compatible, but lynx may avoid some developed ski areas (J. Squires, personal communication 2012). It is possible that ski areas and 4-season resorts may reduce the amount and availability of lynx habitat within localized areas, in part by influencing the distribution or abundance of prey resources within the developed area. However, there is also considerable anecdotal evidence of lynx using ski areas.

Leg-hold trapping is currently prohibited under the state constitution of Colorado as a means of predator con-

trol or for commercial and recreational trapping. If a landowner can prove that all other non-lethal methods have been ineffective, a 30-day exemption may be granted for depredation cases. Incidental trapping mortality of lynx may be a minor risk during trapping seasons in southern Wyoming and surrounding states.

Predator control activities on federal lands, including coyote shooting or trapping, are common throughout most of this geographic area, mostly related to the grazing of domestic sheep. The majority of sheep grazing occurs on arid rangelands, but some grazing does occur during summer at the higher elevations, especially in south-central Colorado. Incidental capture of lynx is possible, but unlikely.

Northern Rocky Mountains Geographic Area

Geographic extent

The Northern Rocky Mountains Geographic Area encompasses western Montana on both sides of the Continental Divide, northeastern and southeastern Washington, northern, central, and southeastern Idaho, northeastern Oregon, northeastern Utah, and western Wyoming. Landforms, climate, and vegetation across this large area are complex and highly variable.

There are strong north-south and east-west gradients in climate across the Northern Rocky Mountains Geographic Area. The northwestern portions have a cool, temperate, maritime-influenced climate, while the eastern and southern portions have a cold continental climate (McNab and Avers 1994). As a result, vegetation varies from moist, dense conifer forests, to less productive forests with greater interspersions of grasslands and shrub lands.

The Northern Rocky Mountains Geographic Area intersects 3 ecological provinces (McNab and Avers 1994, Bailey 1998) and the following Sections within these provinces.

Northern Rocky Mountain Province

- Okanogan Highlands Section (M333A)
- Flathead Valley Section (M333B)
- Northern Rockies Section (M333C)
- Bitterroot Section (M333D)

Middle Rocky Mountain Province

- Idaho Batholith Section (M332A)
- Bitterroot Valley Section (M332B)
- Rocky Mountain Front Section (M332C)
- Belt Mountains Section (M332D)
- Beaverhead Mountains Section (M332E)
- Challis Volcanic Section (M332F)
- Blue Mountains Section (M332G)

Southern Rocky Mountain Province

- Yellowstone Highlands Section (M331A)
- Bighorn Mountains Section (M331B)
- Overthrust Mountain Section (M331D)
- Uinta Mountains Section (M331E)
- Wind River Mountains Section (M331J)

Lynx population status and distribution

Montana: Lynx are ranked by the Natural Heritage Program as S3 species of concern in Montana: “Potentially at risk because of limited and declining numbers, range, and habitat, even though its habitat may be abundant in some areas.”

Historical and current lynx occurrence has been well documented in Montana. Museum records, historical information, and trapping data (McKelvey et al. 2000b) suggest persistence of lynx over time in portions of Montana. Squires et al. (2013) describe more specifically the distribution of lynx in Montana based on 81,523 telemetry points from resident lynx from 1998–2007. Lynx are primarily restricted to northwestern Montana from the Purcell Mountains east to Glacier National Park, then south through the Bob Marshall Wilderness Complex to Highway 200. The southern-most lynx population in Montana is currently in the Garnet Range, except for a few individuals in the Greater Yellowstone Area. From 1999–2006, reproduction was documented at 57 dens of 19 female lynx in Seeley Lake, the Garnet Range, and the Purcell Mountains in western Montana (Squires et al. 2008).

The National Lynx Survey detected lynx in the Lolo and Gallatin National Forests and in Glacier National Park, and additional snow-tracking surveys in conjunction with collection of DNA verified lynx presence on the Kootenai, Flathead, and Helena National Forests (K. McKelvey, unpublished data).

Wyoming: The lynx is considered a species of greatest conservation need by the state of Wyoming. Lynx presence has been documented historically and currently in western Wyoming, from the Wind River Range, Wyoming Range, and the Yellowstone area (McKelvey et al. 2000b). A single lynx specimen was collected from the Big Horn Mountains in 1919. Lynx were detected using the National Lynx Survey protocol on the Shoshone National Forest, but none were detected on the Bighorn National Forest (K. McKelvey, unpublished data). Additional snow-tracking surveys verified lynx presence on the Bridger-Teton National Forest. Recent reproduction was documented in the Wyoming Range through a radio-telemetry study (Squires and Laurion 2000, Squires and Oakleaf 2005). Several lynx that were translocated into Colorado were later found to have dispersed and established home ranges in the Wyoming Range (J. Squires, personal communication 2012).

Idaho: Canada lynx are classified as an S1 Idaho species of greatest conservation need. McKelvey et al. (2000b) reported 22 museum specimens of lynx dating from 1874–1917, all of which were collected north of the Snake River Plain in Idaho. Thirteen other verified records prior to 1960 were also from the north-central and northern regions of the state, with the exception of 2 from Caribou and Bonneville Counties, along the Wyoming border. Of the 35 verified records from 1960 to 1991, most coincided with lynx irruptions in the 1970s. Lynx harvest records are considered to be unreliable prior to the 1980s because of the ambiguous reporting category of “lynx cat.”

Surveys conducted in Idaho using the National Lynx Survey protocol detected lynx only on the Boise National Forest (K. McKelvey, unpublished data). Snow-track surveys in 2007 on 721 km on the Nez Perce National Forest using the protocol developed by Squires et al. (2004) did not detect lynx (Ulizio et al. 2007).

The Idaho Department of Fish and Game (IDFG) established 28 snow track routes to monitor forest carnivores. No lynx were detected on any of the 20 routes that had adequate snow conditions when surveyed by Idaho Department of Fish and Game personnel from 2004–2006 (Patton 2006).

From 2010–2013, IDFG conducted forest carnivore surveys in the Selkirk, Purcell, and West Cabinet Mountains (M. Lucid, Idaho Department of Fish and Game, personal communication 2013). Photographs and genetic

material were obtained from a male lynx in the Selkirk Mountains in 2010; this animal was not re-detected. Genetic material was obtained from a male lynx in the Idaho Purcell Mountains in 2011 and the same individual was again detected in 2012 near the Idaho-Montana state line.

Two lynx were recently captured in traps set for other furbearing animals in Idaho: 1 was released alive in 2012 on the Salmon-Challis National Forest (B. Waterbury, Idaho Department of Fish and Game, personal communication 2013) and 1 was reported to be misidentified as a bobcat and shot in northern Idaho in 2013 (M. Lucid, Idaho Department of Fish and Game, personal communication 2013).

Northeastern Washington: Lynx are considered a species of greatest conservation need in the state of Washington. Lynx occurrence, currently and historically, has been documented in the northeastern corner of the state (McKelvey et al. 2000b). Stinson (2001) stated that the highest lynx harvest in Washington was from Ferry County (Kettle/Wedge) at 35%. Lynx were present and reproducing in the Kettle Mountains through the 1970s (Stinson 2001), but subsequently were probably over-trapped. Currently, only occasional tracks are observed with no evidence of reproduction in northeastern Washington (Koehler et al. 2008).

Northeastern Oregon and southeastern Washington: Lynx are considered infrequent and casual visitors by the state of Oregon. Relatively few historical records of lynx occurrence were found in Oregon (McKelvey et al. 2000b). Only 3 recent (1964, 1974, and 1993) specimens are known from Oregon, and all were collected in anomalous habitats following population peaks in western Canada. The Snake River and Hells Canyon likely would impede lynx movements between Idaho and northeast Oregon/southeast Washington.

Utah: Lynx have been protected from harvest in Utah since 1974. The species is listed by the state as a Tier I species of greatest conservation need.

Relatively few historical records of lynx occurrence were found in Utah (McKelvey et al. 2000b). There are only 3 museum specimens of lynx from Utah from the early 1900s, and later records are all from northwestern Utah near the borders with Wyoming and Idaho (McKelvey et al. 2000b). It is unlikely that the La Sal or Abajo Mountains ever supported a resident lynx population, given the scarcity of records and the absence of snowshoe hares (memo from USDA Forest Service dated March 17, 1999). Prior to 2000, the last verified records of lynx from Utah were in 1977 from physical remains and in 1982 from tracks (McKelvey et al. 2000b). Since 2000, radio-collared lynx reintroduced into Colorado have dispersed into Utah in the northeastern, central, and southeastern portion of the state (Devineau et al. 2010).

Nevada: Lynx are not believed to have been resident in Nevada either historically or currently. Only 2 museum specimens exist from Nevada, both collected in 1916, a year of lynx irruption from their primary range in the northern boreal forest (McKelvey et al. 2000b).

British Columbia: Apps (2007) modeled probable lynx occurrence in southeastern British Columbia and suggested lynx occur in a discontinuous and highly variable pattern. This supports the notion that the population is patchily distributed as nodes of several animals persisting in localized core landscapes that anchor the larger regional population. Trapping and hunting are permitted in the Kootenay Region (southeastern British Columbia, immediately north of northwest Montana and Idaho). The hunting season is from 1–31 December with a bag limit of 1. Compulsory reporting of all captured and killed lynx is required in this region. Trapping occurs on approximately 50 registered traplines with a season from 15 November through 15 February (Ministry of Forests, Lands, and Natural Resource Operations 2012). Apps (2007) commented that no lynx had been trapped in his study area (in the Kootenay Region) in the past 15 years. Between 2000 and 2009, 74 lynx were

reported trapped from the registered traplines.

Lynx habitat

Historical and current lynx records (McKelvey et al. 2000b) from this geographic area occur primarily in the spruce-fir forest potential vegetation types (Kuchler 1964, Pfister et al. 1977, Steele et al. 1981, Johnson and Simon 1987, Williams et al. 1995). Squires et al. (2010) determined lynx primarily foraged in subalpine fir forests with low topographic relief (Squires et al. 2013) during winter, in mid- to high-elevation (1,270–1,995 m [4,166–6,545 ft]) forests of mature, multi-story conifer with high horizontal cover. These environments supported higher-density snowshoe hare populations and provided dense horizontal cover from young trees and conifer boughs touching the snow.

Stand-replacing fire has been a dominant influence historically in the northern Rocky Mountains (Gruell 1983, Barrett et al. 1997). Surface fires, avalanches, insects, and forest pathogens have also been important agents of disturbance, creating more structural diversity at a smaller scale. Fire regimes in the northern Rocky Mountains are extremely complex, reflecting the great variation in climate, topography, vegetation, and productivity (Kilgore and Heinselman 1990). In general, the dominant regime in lynx habitat in pre-settlement times was long-interval (40–200 years), high-severity, stand-replacing fire in continuous forests of lodgepole pine, spruce, and subalpine fir, often with smaller acreages subjected to non-lethal, low-severity fires in the intervals between stand-replacing fires (Fischer and Bradley 1987, Losensky 1993, Smith and Fischer 1997).

Aspen forests occur as scattered inclusions throughout subalpine and montane forests in central and southeastern Idaho, southern Montana, Utah, and Wyoming. Though common and widely distributed, aspen forests occupy a small percentage of the total forested area. Berg et al. (2012) found that some of the highest snowshoe hare densities in Wyoming occur in multi-story mixed aspen/spruce-fir forests. Aspen/tall forb community types, especially those that include snowberry (*Symphoricarpos alba*), serviceberry (*Amelanchier alnifolia*), and chokecherry (*Prunus virginiana*) shrub understories, may be productive habitat for snowshoe hares, grouse, and other potential lynx prey.

Because the Northern Rocky Mountain Geographic Area encompasses such a large and diverse region, descriptions of vegetation and elevation conditions that provide lynx habitat are presented below by state.

Montana: Lynx research has been conducted in the Seeley-Swan Valley (Section M332B), Garnet Mountains (Section M332B), South Fork of the Flathead (Section M333C), and Cabinet and Purcell Mountains (Section M333D; Koehler et al. 1979, Smith 1984, Brainerd 1985, Squires and Laurion 2000, Squires and Ruggiero 2007, Squires et al. 2008, Squires et al. 2010).

The Seeley-Swan study area ranges in elevation from about 1,200–2,100 m (3,900–6,900 ft). Most lynx radiolocations were in the mid-elevation range of 1,300–1,800 m (4,260–5,900 ft), with a few locations up to 2,100 m (6,900 ft). Lynx generally occurred in moist subalpine fir potential vegetation types, above the dry ponderosa pine and Douglas-fir potential vegetation types, and below the alpine zone (Squires et al. 2010). Lynx did not appear to avoid forest roads or groomed snowmobile routes, and snow penetrability did not appear to be a factor in selecting travel routes or capturing prey (Squires et al. 2010). In winter, lynx primarily selected mature multi-story stands, primarily composed of mature Engelmann spruce and subalpine fir trees with lesser components of lodgepole pine, Douglas-fir and western larch. Lynx occupied similar areas year round; however, during the summer, lynx shifted toward more use of regenerating forests with abundant small diameter (2.5–8 cm dbh [1–3 in]) and pole-sized (8–18 cm [3–7 in] dbh) trees, dense shrubs, and high horizontal cover (Squires et al. 2010).

The Garnet Range is characterized by relatively moderate, rolling topography, with gentle to moderate slopes dissected by steep limestone canyons, mostly covered by coniferous forests. Habitat use by 5 radio collared lynx in the Garnet Range occurred in subalpine fir forest associations (Smith 1984). In the Cabinet Mountains, 2 lynx were studied in the west fork of Fishtrap Creek, which has moderate, rolling topography in the lower reaches and steep alpine ridges in the headwaters (Brainerd 1985).

Wyoming: Ehle and Keinath (2002) described the best contiguous lynx habitat in Wyoming as being in the northwestern and western portions of the state. The remainder is highly fragmented, widely dispersed and isolated by arid shrublands (Meaney and Beauvais 2004). In Wyoming, the primary vegetation that may contribute to lynx habitat includes subalpine fir, Engelmann spruce, and lodgepole pine forests at the higher elevations, generally 2,000–3,000 m (6,500–9,800 ft). In the Wyoming Range where 2 lynx were radiocollared, topography was steep to rolling, with about 20% of the area being non-forested, 20% spruce-fir forests (generally occurring on northerly aspects), 10% aspen, and about 10% riparian (Squires and Laurion 2000). The remainder of the area was primarily homogeneous stands of lodgepole pine on drier sites. Lynx habitat in Wyoming has a more open understory with fewer shrubs compared to lynx-use areas in northern Montana (Squires et al. 2003).

Idaho: In Idaho, subalpine fir potential vegetation types occur at upper elevations. Engelmann spruce potential vegetation types occur on very wet sites, on steep northerly aspects where snow accumulates, and along streams and valley bottoms (Steele et al. 1981). Large stands of fire-induced lodgepole pine commonly dominate much of the subalpine fir series in central Idaho (Steele et al. 1981). Undergrowth is variable in these stands, ranging from tall shrub layers of huckleberry (*Vaccinium* spp.) and menziesia (*Menziesia ferruginea*) to low, depauperate understories of grouse whortleberry (*Vaccinium scoparium*) or heartleaf arnica (*Arnica cordifolia*). Sites that are capable of producing dense, tall understory shrubs may be capable of supporting snowshoe hares and lynx.

Utah: In the Uinta Range, Engelmann spruce, white fir, subalpine fir, and lodgepole pine forests occur at the higher elevations, 2,250–3,250 m (7,300–10,500 ft). Quaking aspen dominates over much of the landscape on mountain slopes, but snowshoe hares use aspen stands much less than conifer stands in this area (Wolfe et al. 1982), probably because they lack dense understory cover (Hodges 2000b). Where intermixed with spruce-fir and lodgepole pine stands, aspen stands may contribute to lynx habitat.

Northeastern and southeastern Washington, northeastern Oregon: Subalpine fir potential vegetation types where lodgepole pine is a major seral species (Powell et al. 2007), generally between 1,250–2,000 m (4,100–6,600 ft), may contribute to lynx habitat.

Connectivity of lynx populations and habitat

Maintaining connectivity with Canada and between mountain ranges is an important consideration for this geographic area. Squires et al. (2013) combined resource selection, step selection, and least-cost path models to predict movement corridors for lynx in the northern Rocky Mountains. Connectivity between lynx habitat in Canada and that in the conterminous United States appears to be facilitated by only a few putative corridors that extend south from the international border.

In Wyoming, Squires and Oakleaf (2005) documented a male lynx crossing the 2-lane Highway 181/191 about 16 km (10 mi) east of Bondurant, Wyoming. This male lynx traveled over 500 km (310 mi) during the summers of 2000 and 2001 (Squires et al. 2003) and crossed the highway 4 times when moving between the Wyoming Range and the Wind River Range. The same lynx continued north on an exploratory movement and crossed Highway 26 on Togwootee Pass on a foray west of Yellowstone National Park.

The Kettle Mountains east of Highway 21 near Sherman Pass, Washington historically supported a population of lynx. However, the area was trapped heavily in the 1960s and 1970s and no reproduction has been documented since (Koehler et al. 2008). Recent surveys have only documented occasional single tracks, which suggest lynx have not re-established a population. The north end of the Kettle Crest is bisected by the low-elevation dry forest of the Kettle River valley and Highway 3 in British Columbia, potentially affecting the connectivity of habitat and potential movements from Canada. Maintaining connectivity on both sides of the border may be important to provide genetic exchange for lynx in northeastern Washington.

Snowshoe hare population distribution and habitat

Montana: Historically, western Montana has supported one of the most robust lynx populations in the lower 48 states, indicating there is sufficient prey base to maintain a self-sustaining lynx population. Snowshoe hares have been well documented throughout the Rocky Mountains of Montana from the Canadian border through the Yellowstone area. Adams (1959), Koehler et al. (1979), Malloy (2000), Griffin (2004), and Mills et al. (2005) estimated density and relative abundance of snowshoe hares throughout Montana. Hare densities generally were low, ranging between 0.1–0.6 hares/ha (0.04–0.24 hares/ac).

Hares occupy mixed-conifer forests, dominated by lodgepole pine, Engelmann spruce, Douglas-fir, western larch, and subalpine fir. Differences in hare abundance have been correlated with stand age within study sites in Montana (67 and 50–60 years old, respectively; Koehler et al. 1979, Zimmer 2004). Griffin and Mills (2004) reported strong differences in demographic rates among hare populations inhabiting patches with distinct habitat attributes (i.e., mature versus young, and closed versus open). In western Montana, Griffin and Mills (2004) found the highest snowshoe hare densities in regenerating forest stands with high sapling density and in uncut, mature multi-story stands with abundant saplings.

Zimmer (2004) documented the influence of deep snow on feeding patterns of hares. Lodgepole pine was the most heavily browsed conifer species by free-living hares, composing 59% of the overall diet in southern Montana.

Wyoming: Few data are available on historical distributions of snowshoe hare within Wyoming. Berg (2010) estimated an average density of 1.57 hares/ha (0.63 hares/ac) with a range of 0.07–4.82 hares/ha (0.03–1.95 hares/ac) in a study area in the southern portion of the Greater Yellowstone Area within the Bridger Teton National Forest, encompassing portions of the Absaroka, Gros Ventre, Wind River, Salt River, and Wyoming Ranges. The average density was higher than reported from several other areas of the contiguous United States, British Columbia, Labrador, and Quebec (Hodges 2000b, de Bellefeuille et al. 2001, McKelvey et al. 2002, Murray et al. 2002, Griffin 2004, Ausband and Baty 2005, Newbury and Simon 2005, Potvin et al. 2005, Homyack et al. 2006, Sullivan et al. 2006, Hodges and Mills 2008, McCann et al. 2008, Zahratka and Shenk 2008). Within 7 distinct potential vegetation types identified as suitable for supporting snowshoe hare, Berg (2010) and Berg et al. (2012) found snowshoe hare density to be greatest in multi-story thick spruce-fir forests, although hare densities were still high in dense young lodgepole pine stands (30–70-year-old regenerating lodgepole pine). Hare densities were lowest in young open lodgepole pine stands (Berg 2010). In comparison to the mature, multi-story patches where snowshoe hare density did not increase with increasing stem densities, Berg et al. (2012) found hares in the young, regenerating forests increased as stem densities increased. Overall, Berg concluded that snowshoe hares preferred dense, structurally diverse stands. These attributes were most consistently found on the Bridger-Teton National Forest within older multi-story forests with a spruce-fir component. Berg (2010) suggested that hares may demonstrate seasonal shifts in habitat use in western Wyoming due to the high degree of fragmentation between suitable habitat patches.

Young regeneration stands provide hare habitat over a relatively short period (Zimmer et al. 2008). Berg (2010) suggested that older multi-story stands would maintain higher hare densities over time than lodgepole pine stands 70+ years post-disturbance. Horizontal cover and tree canopy were the most significant predictors of hare density in western Wyoming.

Idaho: Wirsing et al. (2002) reported hare densities in the Clearwater National Forest that ranged from 0.01–0.10 hares/ha (0.004–0.04 hares/ac). Hare distribution throughout the study area was correlated positively with the availability of understory cover (Wirsing et al. 2002). Murray et al. (2002) established 615 transects on the Idaho Panhandle National Forest and estimated a density of 0.14 hares/ha with a range of 0.12–0.23 hares/ha (0.06 hares/ac, range 0.05–0.09 hares/ac). Hare abundance was greatest in habitats containing dense understories (Murray et al. 2002).

In northern Idaho, western red-cedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*) and moist grand fir potential vegetation types support snowshoe hares (Murray et al. 2002), although these forest types do not appear to support lynx.

Utah: Estimated hare densities in a study area in northern Utah (Cache County) were about 0.46 hares/ha (0.19 hares/ac; Dolbeer and Clark 1975). The population studied did not appear to fluctuate, based on trapping records and capture rates during successive years. Snowshoe hares have been reported as absent from the La Sal and Abajo Mountains (memo from USDA Forest Service dated March 17, 1999), but there are documented populations in the Uinta and Wasatch Ranges (Dolbeer and Clark, 1975, Wolfe et al. 1982)

Dolbeer and Clark (1975) found snowshoe hares in Utah selected subalpine fir and lodgepole pine with dense understory cover over other habitats throughout the year, including aspen, which appeared to offer little understory cover for hares, especially in the winter. These findings were similar to Wolfe et al. (1982), who found strong correlations between snowshoe hare habitat use and horizontal cover density. Due to the snow depth and accumulation in northern Utah (commonly exceeding 1.0 m [3.3 ft]), it was suggested that a threshold density of horizontal cover must be available between 1.0–2.5 m (3.3–8.2 ft) above ground in the understory vegetation profile to support hares (Wolfe et al. 1982).

Northeastern Washington: Limited published information is available on snowshoe hares and habitat selection in northeastern Washington. Thomas et al. (1997) suggested that stand density and visual cover estimates were the best indicators of snowshoe hare habitat use in northeastern Washington. The 2 most important browse species were lodgepole pine and Douglas-fir. Low snow accumulation during the winters of 1995–1996 (0–61 cm [0–24 in]) may have accounted for snowshoe hares' use of shrubs that normally would be covered by snow in winter (Thomas et al. 1997).

Northeastern Oregon and southeastern Washington: Hare populations in northeastern Oregon and southeastern Washington are not well documented historically. However, snowshoe hares within this region have been shown to primarily use subalpine fir habitats where lodgepole pine is a major seral species. Moist grand fir and moist Douglas-fir habitats intermixed with subalpine fir habitats are used secondarily.

Human activities and developments specific to the Northern Rockies

McKelvey et al. (2011) used a variety of climate models to predict snow depth and the persistence of spring snow to infer effects of climate change on boreal species, specifically the wolverine. Snow depth and persistence are predicted to decline throughout the area during the 21st century. However, the models predicted that large areas of persistent snow would continue to be retained along the Montana-Idaho border and in the

Greater Yellowstone area. Idaho is predicted to lose proportionately more of its snow cover than either Montana or Wyoming, although there is a large degree of uncertainty associated with future snow conditions in Idaho.

Most climate change models generally predict a warmer and drier climate in this geographic area (Gayton 2008). With warming climate, fire seasons in the western United States will likely be extended and have higher severity, and the total area burned is likely to increase (McKenzie et al. 2004). This may reduce available lynx habitat, especially during the winter.

Precommercial thinning in Montana was shown to reduce snowshoe hare abundance in the short term (Griffin and Mills 2007). Forest plans were amended in 2008 to incorporate management direction that would conserve lynx, including direction that will minimize the impacts of thinning in lynx habitat.

Few highways intersect lynx habitat in this geographic area. State Highway 83 bisects the Swan Valley, but it does not appear to impede movement since radiocollared lynx have been documented to cross this highway (Squires and Laurion 2000).

Intense oil and gas development, such as is occurring in the Wyoming Range, may fragment habitat and may reduce or isolate already small populations of lynx.

The states regulate and administer hunting and trapping. Ten lynx have been reported captured in traps set for other species since 2000, resulting in at least 4 mortalities. Outreach and education efforts and trapping regulations are targeted to reduce the potential for incidental trapping and mortality of lynx. For example, in Montana, current furbearer trapping regulations (<http://fwp.mt.gov/fwpDoc.html?id=56843>) recommend that traps be checked every 48 hours (this is mandatory for wolf trapping <http://fwp.mt.gov/fwpDoc.html?id=56685>). In addition, an 8-pound pan tension requirement has been established in 2 trapping districts in western Montana. Idaho and Wyoming require that leghold and other live traps be visited at least every 72 hours. Washington does not allow body-gripping traps or pursuing animals with dogs. Utah requires trap checks at least every 48 hours.

Predator control activities on federal lands are commonly conducted throughout this geographic area, but the level of activity is currently lower than historical levels. Such efforts are aimed specifically at the offending animal or target species and usually take place outside of lynx habitats, in lower-elevation rangelands. As a result of the ban on poisons such as 1080 and adoption of wildlife conservation practices for lynx, predator control activities on federal lands conducted by USDA Wildlife Services probably have a low potential to impact lynx.

Cascade Mountain Geographic Area

Geographic extent

Vegetation and landforms in the Cascade Mountains of Washington have been described by Daubenmire and Daubenmire (1968), Franklin and Dyrness (1973), Demarchi (1994), McNab and Avers (1994), and Hann et al. (1997), among others. The Cascade Mountains Geographic Area is in the Cascade Mixed Forest-Coniferous Forest-Alpine Meadow Province (McNab and Avers 1994). Three sections are described within this province: Oregon and Washington Coast Ranges, Western Cascades, and Eastern Cascades. Current (Koehler et al. 2008, Maletzke et al. 2008) and historical (McKelvey et al. 2000b) records suggest that in the Cascade Mountains, lynx are found only on the east side of the range in Washington. Thus, the Eastern Cascades section is the only section in the Cascade Geographic Area that supports a reproductive lynx population. Lynx habitat is

restricted to the subalpine fir potential vegetation type and adjacent habitats.

Volcanic peaks and glaciation have resulted in relatively steep eastern slopes. Many volcanic peaks are above the surrounding topography, some of which are still active. Volcanic ash originally covered the east slope. Elevations range from sea level to greater than 3,050 m (10,000 ft; McNab and Avers 1994).

Lynx population status and distribution

Museum records (McKelvey et al. 2000b) verify the presence of lynx in the Cascade Range of Oregon and Washington during historical times. However, the distribution of lynx was generally restricted to habitat occurring east of the Cascade Crest in northern Washington (Stinson 2001). Aubry et al. (2000), McKelvey et al. (2000b), and Mowat et al. (2000) reported lynx to be absent or uncommon in wet, coastal forests of western North America. Current and historical verified lynx records from the west side of the Cascade Crest in Washington or in the Cascade Range of Oregon are extremely rare: 12 from western Washington and 1 from Oregon. Ten of the 12 records from western Washington were of 1 individual from the Mt. Adams area (McKelvey et al. 2000b). Lynx still occur in the north-central Cascades of Washington; Brittell et al. (1989), Koehler (1990a), von Kienast (2003), Koehler et al. (2008), Maletzke et al. (2008), and unpublished data on file at the Methow Valley Ranger District documented continued occupancy of this area from 1980–2012.

The National Lynx Survey (McKelvey et al. 1999) was initiated in 1999 to sample lynx habitat across the historical range to better understand lynx distribution in the contiguous United States; most survey grids were completed in 2002. There were 19 survey grids established in the Washington and Oregon Cascades, each monitored for at least 3 years. Two of the survey grids had lynx detections: 1 in the northern Okanogan National Forest north of Highway 20, and the second (Aubry et al. 2002) was along Highway 20 on the Okanogan-Wenatchee National Forest.

The Okanogan Region in British Columbia lies immediately north of the Cascade Geographic Area. Trapping occurs on approximately 25 registered traplines and the region has a compulsory reporting requirement for any lynx taken. Trapping and hunting seasons currently are from 15 November through 15 February (Ministry of Forests, Lands, and Natural Resource Operations 2012). The hunting bag limit is 1. Between 2000 and 2009, 82 lynx were trapped. The majority of those were from 5 registered traplines. The other traplines reported 0–4 lynx over the 10 year period.

Lynx habitat

In the Cascade Mountains Geographic Area, subalpine fir potential vegetation types provide lynx habitat (McCord and Cardoza 1982, Koehler 1990a, Apps 2000, Aubry et al. 2000, McKelvey et al. 2000b, Koehler et al. 2008). Fire, insect outbreaks, and root rot are common disturbance agents in the subalpine zone (McNab and Avers 1994). The natural frequency, intensity, and extent of fire are highly variable in the Eastern Cascades section.

Maletzke et al. (2008) described lynx habitat in the Black Pine Basin area of north-central Washington as Engelmann spruce and subalpine fir on slopes <30° at elevations between 1,525–1,828 m (5,000–6,000 ft), and moderate canopy closure (11–39%). Lodgepole pine is frequently present as a seral species in subalpine fir potential vegetation types. The elevations of lynx habitats vary, depending on moisture patterns and temperatures. Subalpine fir potential vegetation types are generally present above 1,220 m (4,000 ft) on the east side of the Cascade Mountains (Williams and Lillybridge 1983, Lillybridge et al. 1995). These potential vegetation types generally occur in areas with heavy winter snowfalls. Cool, moist Douglas-fir, grand fir, Pacific silver fir, or western larch forests, where they are interspersed with subalpine fir forests, may also contribute to lynx habitat.

During winter, lynx selected mature multi-story Engelmann spruce and subalpine fir habitats in Washington (Koehler et al. 2008, Maletzke et al. 2008). These stands generally had a component of young trees in the understory and lower limbs touching the snow (von Kienast 2003, Koehler et al. 2008, Maletzke et al. 2008). Von Kienast (2003) reported that lynx generally avoided young (<15 years old) conifer regeneration (primarily lodgepole pine) resulting from timber harvest and wildfires that was not protruding through the snow during winter. Lynx movements and hunting behavior were associated with mature Engelmann spruce and subalpine fir stands, dense understory cover, and high densities (>1 hare/ha [>0.4 hares/ac]) of snowshoe hares (Maletzke et al. 2008). Lynx used edges of recently burned areas, recent clear cuts, and forest openings, but rarely crossed openings greater than 150 m (500 ft; von Kienast 2003, Maletzke et al. 2008). Forest openings and stands dominated by Douglas-fir or ponderosa pine were generally avoided (Koehler et al. 2008, Maletzke et al. 2008).

Koehler and Aubry (1994) and Maletzke et al. (2008) described lynx habitat as generally occurring in areas of low topographic relief. Apps (2000) found selection for slope was significant among 3 of 6 radio-collared lynx in the southern Canadian Rocky Mountains. Of those 3 animals, 2 selected and 1 avoided <20 percent slopes during the summer, and >40 percent slopes were avoided by all of the lynx during winter. In north-central Washington, lynx preferred <30° slopes during winter (Koehler et al. 2008, Maletzke et al. 2008).

Connectivity of lynx populations and habitat

Connectivity to larger lynx populations in Canada is important to ensure the long-term persistence of lynx populations in the United States (U.S. Fish and Wildlife Service 2005). There are no known barriers to movement between the Cascades in the United States and British Columbia.

Lynx are highly mobile and able to disperse long distances. It is nevertheless important to maintain connectivity between blocks of habitat to support populations and promote genetic exchange. Forest disturbances such as large wildfires and timber harvest have affected the current distribution and movement patterns of lynx in Washington (Koehler et al. 2008). The juxtaposition of forest disturbance in relation to topographic features and the current amount and arrangement of forest vegetation can directly affect habitat connectivity for lynx.

The North Cascades Highway, Highway 20, bisects lynx habitat in the Cascades Geographic Area, but it is closed during the winter (typically late November through mid-April) because of deep snowpack and avalanches. Much of the lynx habitat is north of the highway, but habitat and lynx are present south of the highway. Surveys in 2000 and 2001 along Highway 20 were designed to determine if lynx crossed the highway during summer months when it was open (Aubry et al. 2002). Lynx were detected on both sides of the highway, but the DNA samples were not sufficient to determine whether these were the same or different individuals. Apps (2007) reported that lynx in the southern Canadian Rocky Mountains do cross highways, but highways can affect movements depending on the highway type and use.

As it is throughout the range of lynx in the contiguous U.S., maintaining connectivity with Canada is important to lynx populations in northern Washington and the Cascade Mountains. Singleton et al. (2002) evaluated landscape permeability for large carnivores in Washington. They reported broad landscape permeability for lynx between the Thompson River watershed in British Columbia and the United States portion of the northern Cascades. Currently, connectivity appears functional, as lynx dispersal from Washington into Canada was recently documented. A male lynx radiocollared in 2008 in the Loomis State Forest remained there until late winter in 2009, when it dispersed north into Canada toward Hope, British Columbia, and then headed northeast toward Kamloops where it appeared to establish a home range just southeast of Kamloops. This individual was later trapped and killed in British Columbia, highlighting the need for cooperation and shared management

goals across political boundaries.

Snowshoe hare population distribution and habitat

Snowshoe hares in the Cascade Mountains Geographic Area are found primarily in boreal forests of sub-alpine fir and Engelmann spruce, but can also be found in stands that are occasionally interspersed with Douglas-fir, lodgepole pine, western larch, and whitebark pine (Walker 2005). Based on pellet counts in north-central Washington, Koehler (1990a) reported that snowshoe hare densities were highest in 20-year old lodgepole pine stands with 16,320 stems/ha (2,559 stems/ac), in both winter and summer.

Snowshoe hare pellet densities in Washington were correlated with understory (horizontal) cover, sapling density, and medium-size tree density (Walker 2005). Hares were plentiful in both young regenerating forests and older multi-story Engelmann spruce and sub-alpine fir forests with dense understories. Structural density and the amount of contiguous habitat were important considerations when managing for hares. The landscape mosaic within which snowshoe hare habitat was embedded had the potential to influence snowshoe hare densities by affecting movement characteristics and resource availability.

Lewis et al. (2011) sampled 76 stands that were about 20 ha (49 ac) in size across a study area in northcentral Washington. They reported an average density of 0.82 hares/ha (0.33 hares/ac), ranging from 0.03–2.38 hares/ha (0.01–0.96 hares/ac). This compares favorably with the estimate by Ruggiero et al. (2000b) that a density of at least 0.5 hares/ha (0.2 hares/ac) is required to support a lynx population.

Human activities and developments specific to the Cascades

McKelvey et al. (2011) used a variety of climate models to predict snow depth and the persistence of spring snow during the 21st century to infer effects of climate change on boreal species. The models predicted that despite an overall decrease in persistent snow, large areas of spring snow cover will continue to persist in northern Washington. The Pacific Northwest is characterized by large amounts of winter precipitation at temperatures near freezing. Modest increases in temperature due to climate change would cause precipitation to fall as rain rather than snow, making its snowpack highly vulnerable to loss. However, perhaps because historical snowpack is so deep and extensive in the Pacific Northwest, estimated spring snow cover is not expected to be impacted as much by climate change as some other areas such as Idaho.

Some vegetation management practices, especially thinning in young dense regeneration and reducing overstory canopy in mature multi-story spruce-fir forests, have likely had detrimental effects to snowshoe hares and lynx in the past. On national forest system lands in the Cascades, the priority for vegetation management is in the dry and mesic forests, with minimal treatments in the subalpine fir forests. On state managed forests (Loomis State Forest) precommercial thinning in lynx habitat has been conducted.

Koehler et al. (2008) reported that more than 50% of the lynx habitat in the Chelan and Okanogan Counties has burned in the past 2 decades (1990–2010). Increases in the length of the fire season and in the annual area burned as a result of climate change (McKenzie et al. 2004) could further reduce available lynx habitat.

Climate change has increased forest insect infestations within the Cascade Mountains (Carroll et al. 2003, Taylor and Carroll 2004). Climate change may cause further changes to natural disturbance regimes.

Lynx habitat in the western portion of the Cascade Mountains Geographic Area is naturally fragmented (Koehler et al. 2008). Lewis et al. (2011) reported that landscapes with contiguous snowshoe hare habitat, or where patches of hare habitat are surrounded by patches of similar habitat quality, support more snowshoe

hares than more fragmented landscapes or where surrounding patches are of poorer quality habitat. Lynx in the Black Pine Basin area of northcentral Washington avoided openings, burned areas, and other areas with <10% overstory cover (Koehler et al. 2008). While a landscape mosaic is desirable, vegetation management projects that create large openings can reduce the quality of snowshoe hare habitat, requiring lynx to travel farther and increase energy expenditures when foraging, leading to an increased risk of starvation.

State Highways 2 and 20 are the only paved highways through lynx habitat in the Cascades Geographic Area. Highway 20 is closed because of avalanche hazard during the winter (generally from mid-November through March) and is a low-volume highway in the summer. Highway 2 is the southern boundary of known lynx occupancy. Highway 20 bisects lynx habitat in the United States and Highway 3 in British Columbia bisects habitat to the north. There were no known lynx mortalities along either highway in the past 15 years.

Incidental trapping and illegal shooting of lynx are low risks in the Cascades. Body-gripping traps are not legal in Washington (except by permit for “animal problems”), which reduces the risk of mortality if a lynx were to be incidentally trapped. The trap check requirement in Washington is 24 hours for non-killing restraint traps. One accidental lynx shooting occurred in October 1999 in the Washington Cascades. A lynx was shot by a licensed hunter, who mistook it for a bobcat (H. Allen, Washington Dept. of Fish and Wildlife, personal communication 1999). Since that incident, no illegal or accidental lynx shootings have been reported in this geographic area.

Chapter 4 - ANTHROPOGENIC INFLUENCES ON LYNX AND LYNX HABITAT

The Lynx Biology Team identified “risk factors” in the 2000 LCAS that were a suite of programs, practices, and activities with the potential to negatively influence lynx or lynx habitat. The list of risk factors was meant to be inclusive; and to help ensure that no possible impacts would be overlooked, it was not prioritized.

Since then, substantial new scientific literature on lynx and their habitat has been published. This new information has improved the understanding of the ecology of lynx across the southern edge of their range, and their responses to various forms of resource management and other human activities (now referred to as anthropogenic influences). Based on new scientific information, the 2003 listing (Remanded Rule), and professional judgment gained from experience in managing lynx habitat, we developed a list of anthropogenic influences that may affect lynx and lynx habitat. By consensus, we grouped these into 2 tiers: those that have the potential to negatively effect lynx populations and habitat, and those that may affect individual lynx but are not likely to have a substantial effect on lynx populations and lynx habitat.

Not every possible human activity that could occur in lynx habitat has been examined. Rather, in this chapter we identify those anthropogenic influences most likely to occur in lynx habitat and for which we have information indicating how they may affect lynx and lynx habitat. The concepts and approach used here also could be applied to other activities that are not specifically addressed in this document.

As described in Chapter 2, lynx are highly specialized predators of snowshoe hares, are vulnerable to certain types of human-induced mortality, and occur at low densities and in small populations throughout their range in the contiguous United States. These natural history characteristics increase their susceptibility to local extirpation. These attributes are important drivers of lynx population dynamics, and were considered as we evaluated the potential impact of the various anthropogenic influences.

The first tier of anthropogenic influences includes climate change, vegetation management, wildland fire and fragmentation of habitat. Each of these can directly effect both snowshoe hare and lynx population dynamics. There is some uncertainty about the rate and magnitude of impacts from climate change, and federal agencies may be limited in actions that can be taken to ameliorate those impacts. Nevertheless, those impacts will interact with and perhaps magnify the effects of vegetation management, wildland fire, and fragmentation of habitat.

The second tier of anthropogenic influences include several activities that were previously identified as “risk factors” in the 2000 LCAS. Subsequent research or management experience have shown that these are not likely to have substantial effects on lynx or their habitat. The discussion of the anthropogenic influences in the second tier provides updated information about these relationships.

Some risk factors, including habitat degradation by non-native invasive plant species, development of reservoirs, conversion to agriculture, and lynx movement and dispersal across shrub-steppe habitats, have been dropped entirely from the revised LCAS. This is because they are now thought to have few or no impacts on lynx or lynx habitat.

In this chapter, we describe how specific anthropogenic influences could impact lynx via the primary drivers of their population dynamics: snowshoe hare prey base, direct mortality, and small population effects. This provided the foundation for development of the conservation measures, which are actions within the authority and jurisdiction of the federal agencies that can be taken to conserve the lynx.

Federal agencies have amended or revised land management plans across much of the range of the lynx to provide direction to conserve lynx and lynx habitat. Thus the impacts of anthropogenic influences have been substantially reduced. Maintaining consistent and appropriate management direction is important to minimize the impacts, particularly for the 4 anthropogenic influences included in the first tier.

First tier of anthropogenic influences

In the first tier are 4 anthropogenic influences that are of greatest concern to the conservation of the lynx. Some regulations or policy may be in place to minimize impacts on lynx or lynx habitat, but we address them fully here because by their nature, these anthropogenic influences can directly impact lynx and their snowshoe hare prey. Chapter 5 contains conservation measures that address vegetation management, wildland fire management, and fragmentation of habitat. No conservation measures are identified for climate change due to the limited ability of the federal land management agencies to alter the current trajectory.

Climate change

Physical and biological systems on all continents and in most oceans are being affected by climate change, especially by regional temperature increases (Rosenzweig et al. 2007). Climate change is strongly affecting some species and altering many aspects of systems that are related to snow, ice, and frozen ground (Hannah and Lovejoy 2003, Root et al. 2003, Harris et al. 2006, Parmesan 2006, Rosenzweig et al. 2007). Inkleby et al. (2004) and Rosenzweig et al. (2007) predicted that the ranges of wildlife and native plants in North America will generally move northward or to higher elevations as temperatures increase.

Several possible effects of climate change on lynx can reasonably be anticipated. These include: 1) potential upward shifts in elevation or latitudinal distribution of lynx and their prey; 2) changes in the periodicity or loss of snowshoe hare cycles in the north; 3) reductions in the amount of lynx habitat and associated lynx population size due to changes in precipitation, particularly snow suitability and persistence, and changes in the frequency and pattern of disturbance events (e.g., fire, hurricanes, insect outbreaks); 4) changes in demographic rates, such as survival and reproduction; and 5) changes in predator-prey relationships. In addition, it is possible that interactions between these variables may intensify their effects.

Shifts in distribution. Arctic and alpine ecosystems are expected to be among the most sensitive to climate warming (Diaz and Millar 2004). Less snowfall, reduced extent of snow cover, accelerated retreat of most mountain glaciers, and earlier spring snowmelt have already been observed across much of the northern latitudes (Gitay et al. 2002). Results from climate change modeling suggest that snow cover in the contiguous United States will be substantially reduced in extent and distribution (McKelvey et al. 2011). From this can be inferred a contraction of the range of lynx. In Maine, for example, it is predicted that once annual snowfall declines below a key threshold of 270 cm/yr (106 in/yr; Hoving et al. 2005), lynx may be displaced by bobcats (Jacobson et al. 2009).

Changes in periodicity of the snowshoe hare cycle. The 10-year cycle that occurs in northern Canada and Alaska involves an interaction between lynx, hares, and the hares' plant resources (Krebs et al. 1995, 2001a). The periodicity of lynx abundance may be triggered by North Atlantic Oscillation (NAO) climate effects (Stenseth et al. 1999), with the strength of the trophic interactions varying with region-specific vegetation (e.g., forest-tundra, boreal conifer-deciduous mixed woods) and winter conditions. NAO-determined winter snow levels may mediate lynx hunting efficiency, the effects of which then cascade down through snowshoe hares to the plants (Stenseth et al. 1999, Krebs et al. 2001b).

In Europe, there are indications that the population cycles of voles, grouse, and insects now are breaking down, with several lines of evidence implicating climate change as the underlying cause (Ims et al. 2008). The geographical borders between cyclic and noncyclic populations are shifting, and the spatial extent of regions that have cycles are shrinking. The collapse of cycles in herbivores with high-amplitude population cycles also would imply collapses of important ecosystem functions such as pulsed flows of resources and disturbances (Schmitz et al. 2003, Ims et al. 2008). A common denominator of cycles that exhibit spatial gradients, such as the more pronounced cycle of snowshoe hares in its northern range of North America, is that the cycles appear to fade as winters become shorter (Ims et al. 2008). The loss of the hare cycle would likely translate into a reduced potential for lynx to expand into new or unoccupied habitat in Canada or the adjoining United States.

Reduction in lynx habitat and population size. Climate change may reduce the extent of deep snow habitats selected by lynx. Based on a general circulation model, Kerr and Packer (1998) predicted that lynx would be

among the 25 mammal species in Canada likely to undergo significant losses of habitat, with accompanying decreases in population size. McKelvey et al. (2011) estimated that contiguous areas of spring snow cover would become smaller and more isolated throughout the Columbia, Upper Missouri, and Upper Colorado Basins, with greatest losses at the southern periphery, which likely is an indicator of the trajectory of lynx habitat. According to Carroll (2007), climate change could result in dwindling of potential lynx habitat in the northern Appalachians to small areas in the Canadian Maritime Provinces.

Forests in the northeast are predicted to significantly change in the next 100 years under every emissions scenario (Prasad et al. 2007). The extent of oak and pine forest types is projected to increase and expand into central and possibly northern Maine (Iverson et al. 2008). Maine and the northeast forest region are predicted to lose much of their spruce-fir and mixed-conifer forest, including upland spruce-fir forest and lowland spruce flats (Prasad et al. 2007, Ollinger et al. 2008, Tang and Beckage 2010). Warming climate and selective logging for conifers has already resulted in an increase of the deciduous forest in northern Maine (Seymour 1992), which is contributing to fragmentation of lynx habitat (Simons 2009).

Galatowitsch et al. (2009) estimated that by 2069, average annual temperatures in Minnesota will increase 3° C (5.4° F) with a slight increase (6%) in precipitation. Minnesota forests will experience warmer summers with more frequent and longer droughts. Most simulations for the Great Lakes-St. Lawrence Basin predict reduced precipitation and lower lake levels (Inkley et al. 2004). Similarly, most climate models predict that the northern Rockies and the Greater Yellowstone ecosystem will be warmer and drier, with increased risk of bark beetle epidemics and forest fires in susceptible age classes. The recent mountain pine beetle outbreak in British Columbia, for example, was associated with warmer winters, longer growing season, and fire suppression (Gayton 2008).

An increasing occurrence and persistence of drought, along with associated insect outbreaks and wildfires, could rapidly and dramatically affect the distribution, amount, and composition of lynx habitat. Cohen and Miller (2001) suggested climate change could alter both the nature and extent of wildfire and beetle outbreaks. With warming climate, fire seasons in the western United States will likely be extended and the total area burned may increase (McKenzie et al. 2004). Westerling et al. (2006) predicted that warmer springs could increase the frequency and duration of wildfires, which in turn could reduce the resistance of surviving trees to bark beetle attack. Raffa et al. (2008) suggested that increasing temperatures and forest homogeneity likely will result in bark beetle outbreaks that exceed natural disturbance thresholds; this may set the landscape for additional outbreaks since there will be even-aged forests over a larger area.

Westerling et al. (2006) compiled information on large wildfires in the western United States from 1970–2004; large wildfire activity increased suddenly and markedly in the mid-1980s, with higher large-wildfire frequency, longer wildfire durations, and longer wildfire seasons. The greatest increases occurred in mesic, middle- and high-elevation forest types (such as lodgepole pine and spruce-fir) in the northern Rocky Mountains. Fire exclusion has had little impact on natural fire regimes of these higher-elevation forest types in this area; rather, climate appears to be the primary driver of forest wildfire risk. Large wildfires were strongly associated with increased spring and summer temperatures and an earlier spring snowmelt.

Changes in demographic rates. Incremental changes in climate would affect lynx directly or indirectly through effects on prey abundance. Annual weather patterns are known to affect survival and reproduction of snowshoe hares, which in turn would influence lynx productivity and survival. Reductions in lynx population size and the amount of available habitat possibly could decrease the likelihood of persistence of smaller subpopulations and successful genetic interchange between subpopulations (Gonzalez et al. 2007).

Changes in predator-prey relationships. Climate change is likely to negatively affect lynx habitat and its ability to support lynx and snowshoe hares, although the rates of change and magnitude of effects are difficult to predict. It seems likely that snowshoe hares, which have shorter generation times than lynx, would respond to habitat changes more quickly than would the lynx themselves.

A characteristic of the snowshoe hare is its seasonal pelage coloration, turning white during the winter from a brown coat in the other seasons. This pelage change appears to be triggered by day length (Severaid 1945). A

shift in the duration of snow cover could result in a mismatch of the pelage of snowshoe hares with the background color of its environment, increasing its vulnerability to predation. Over time, natural selection pressure could be expected to correct the mismatch.

Reduced snow depth, condition, and persistence may diminish the competitive advantage of lynx relative to bobcats and coyotes. This could also increase the likelihood of habitat overlap with wolves and mountain lions, increasing predation risk to lynx and competition for snowshoe hare prey.

Federal land management agencies have limited ability to alter the trajectory or to ameliorate the effects of climate change. Assessments should be conducted to consider possible ways to assist with adaptation to climate change. Chapter 6 of this document identifies research needs, which include the need for additional work to more accurately predict specific effects of climate change on lynx.

Vegetation management

Stand structure, composition, and arrangement are important elements of habitat for snowshoe hares and lynx. Vegetation management practices can have beneficial, neutral, or adverse effects on lynx and snowshoe hare habitat and populations, and the duration of effects varies. Effects of vegetation management on snowshoe hare habitats have been studied across the range of the species (Conroy et al. 1979, Sullivan and Sullivan 1988, Koehler 1990b, Thomas et al. 1997, Homyack et al. 2005, Robinson 2006, Griffin and Mills 2007, Berg 2010, Ivan 2011a, Lewis et al. 2011, and McCann and Moen 2011). Effects on lynx have been investigated by Koehler (1990a), Koehler and Brittell (1990), Fuller et al. (2007), Homyack et al. (2007), Moen et al. (2008), Vashon et al. (2008b) and Squires et al. (2010).

Vegetation management occurs across the range of the lynx and can directly affect important habitats and prey. Management activities uninformed by consideration of negative impacts to the species were identified as being of greatest potential concern to lynx conservation (Federal Register, July 3, 2003, vol. 68, no. 28, pp. 40076-40101).

Historically, the dominant natural disturbance processes that created early-successional stages within the range of the lynx were wind events, fire, and insect and disease outbreaks (Kilgore and Heinselman 1990, Heinselman 1996, Veblen et al. 1998, Agee 2000, Seymour et al. 2002, Lorimer and White 2003). In forests of the Northeast Geographic Area, wind, fire, insects, and diseases were predominant natural disturbance agents, while fire, insects, and diseases were predominant in the Great Lakes Geographic Area and across the western United States.

After disturbances, forests generally develop through several stages described by Oliver (1980) as “stand initiation,” “stem exclusion,” “understory reinitiation,” and “old growth.” Stand dynamics, particularly within-stand competition for light, nutrients, and space, determine how forests grow and respond to intentional manipulations and natural disturbances (Oliver and Larson 1996). The frequency and severity of disturbances influence which species will dominate in a stand after the disturbance event. The stand initiation stage, once the trees have established and grown tall enough to protrude above the snow, may provide snowshoe hare and lynx habitat. During the stem exclusion stage, the tree crowns lift and lower branches self-prune, thus growing above the reach of snowshoe hares. As the stand moves into understory reinitiation and old-growth structural stages, food and cover may again become available to support snowshoe hares.

Commercial timber management of conifer forests traditionally has been designed to: reduce tree density and promote tree growth (e.g., precommercial thinning), especially in young regenerating forests; improve growth and vigor of mature trees (e.g., commercial thinning, thinning from below); reduce the vulnerability of commercially-valuable trees to insects and disease (e.g., commercial thinning, group selection); and harvest forest products (e.g., regeneration harvest). Timber management practices may mimic natural disturbance processes but often are not an exact ecological substitute. Some practices, such as use of herbicides to suppress hardwood regeneration, do not have an historical analogue. Timber harvest may differ from natural disturbances by:

- Removing most standing biomass from the site, especially larger size classes of trees, and down logs, which alters microsite conditions and nutrient cycling;

- Creating smaller, more dispersed patches and concentrating harvest at lower elevations in mountainous regions and on more nutrient rich soils, resulting in habitat fragmentation;
- Causing soil disturbance and compaction by heavy equipment, which may result in increased water runoff and slower tree growth at the site; or
- Giving a competitive advantage to commercially-valuable tree species and reducing the structural complexity of the forest through the application of harvest, planting, thinning, and herbicide treatments.

Stem density and snowshoe hare density are directly and positively correlated (Conroy et al. 1979, Sullivan and Sullivan 1988, Koehler 1990b, Koehler and Brittell 1990, Thomas et al. 1997, Hodges 2000a, Mowat et al. 2000, Homyack et al. 2006). Vegetation management that promotes high stem density and dense horizontal cover can increase snowshoe hare densities (Keith and Surrendi 1971; Fox 1978; Conroy et al. 1979; Wolff 1980; Parker et al. 1983; Livaitis et al. 1985; Bailey et al. 1986; Monthey 1986; Koehler 1990a, b; Robinson 2006; Fuller et al. 2007; Homyack et al. 2007; Scott 2009; McCann and Moen 2011).

Where the objective is to provide snowshoe hare habitat by creating additional early-successional forest conditions, management considerations include selecting areas that are capable of, but not currently providing, dense horizontal cover (e.g., stem exclusion structural stage), designing the appropriate size and shape of treatment units, retaining coarse woody debris, and maintaining high stem densities in regenerated forests (Koehler and Brittell 1990, Homyack et al. 2004, Bull et al. 2005, Fuller and Harrison 2005, Ivan 2011a).

Precommercial thinning of young, dense regenerating conifers is generally designed to increase the growth of selected trees by removing competing trees of the same species or shrubs and trees of other species (Plate 4.1; Daniel et al. 1979; Homyack et al. 2005, 2007). Reducing the density of sapling-sized conifers in young re-



USDA Forest Service

Plate 4.1. Precommercial thinning, as seen in the stands on the left of the photo, reduces dense horizontal cover and results in lower snowshoe hare density.

generating forests to increase the growth of certain selected trees promotes more homogeneous patches and reduces the amount and density of horizontal cover, which is needed to sustain snowshoe hares (Sullivan and Sullivan 1988, Hodges 2000b, Griffin and Mills 2004, Ausband and Baty 2005, Griffin and Mills 2007, Homyack et al. 2007, Ellsworth 2009). Precommercial thinning has been shown to reduce hare numbers by as much as 2- and 3-fold (Griffin and Mills 2004, 2007; Homyack et al. 2007) due to reduced densities of sapling and shrub stems and decreased availability of browse. Griffin and Mills (2007) reported that, if their results were repre-

sentative, the practice of precommercial thinning could significantly reduce snowshoe hares across the range of lynx.

There are anecdotal examples of precommercially thinned stands that subsequently "filled in" with understory trees. Some have suggested this could be a technique to extend the time that understory trees and low limbs provide the dense horizontal cover that constitutes snowshoe hare habitat. The duration between time of thinning and regrowth to a height providing winter snowshoe hare habitat would likely vary by tree species, each having different regenerative capacities that could be influenced by a variety of local factors (e.g., topographic relief, moisture, and mineral and organic content of the soil; Baumgartner et al. 1984, Koch 1996). Bull et al. (2005) reported that the slash and coarse woody debris remaining after precommercial thinning provided both forage and cover for snowshoe hares up to a year following treatment. However, Homyack et al. (2007) found that snowshoe hare densities were reduced following precommercial thinning for 1–11 years post-thinning. They further suggested that after precommercial thinning, the stands did not regain the structural complexity in the understory that would be needed to support snowshoe hare densities to the level that were present pre-treatment. At this time, no other data are available to quantify the re-establishment of snowshoe hare habitat and over what time period, or the response by snowshoe hares, as compared with sites that were not precommercially thinned, so this remains an unproven management technique. As an alternative to standard precommercial thinning (i.e., complete thinning resulting in a homogeneous patch), Griffin and Mills (2007) suggested retaining at least 20% of the patch in untreated clumps of about ¼ ha (½ ac), which would maintain hare habitat in the short term. However, Lewis et al. (2011) found that landscapes with patches of high-quality habitat surrounded by similar vegetation supported more hares than did more fragmented landscapes composed of high-quality patches in a matrix of poorer-quality habitat. Further long-term studies of modified thinning methods are needed.

Uneven-aged management (single tree and small group selection) practices can be employed in stands where there is a poorly developed understory, but have the potential to produce dense horizontal cover for snowshoe hares. Removal of select large trees can create openings in the canopy that mimic gap dynamics and help to maintain and encourage multi-story attributes within the stand.

If removal of large trees opens the canopy to the extent that the patch functions as an opening, this may discourage use by lynx (Plate 4.2; Koehler 1990a, von Kienast 2003, Maletzke 2004, Squires et al. 2010). Removal of larger trees from mature multi-story forest stands to reduce competition and increase tree growth or resistance to forest insects may reduce the horizontal cover (e.g., boughs on snow), thus degrading the quality of winter habitat for lynx (Robinson 2006, Koehler et al. 2008, Squires et al. 2010). Similarly, removing understory trees from mature multi-story forest stands reduces the dense horizontal cover selected by snowshoe hares, and thus reduces winter habitat



Plate 4.2. Wildfires and vegetation management techniques such as clearcutting create openings in the forest canopy. Large openings may be avoided by lynx, especially during the winter.

for lynx (Koehler et al. 2008, Squires et al. 2010).

Current favorable habitat conditions for snowshoe hare and lynx in Maine resulted from large-scale salvage cutting following a spruce budworm outbreak in the 1970s and 1980s (Hoving et al. 2004). After salvage harvest of the affected trees, a portion of the area was sprayed with herbicide to reduce deciduous competition (Scott 2009). This created favorable habitat conditions for snowshoe hares and lynx. After the passage of the Maine Forest Practices Act of 1989, various forms of partial harvesting have since replaced clearcutting as the predominant form of forest management in northern Maine. Partial harvested stands result in a wide range of residual stand conditions, but many have lower conifer stem densities and higher hardwood density than regenerating clearcuts (Robinson 2006). On average, partial harvested stands supported about 50% of the hare densities observed in regenerating clearcuts (Robinson 2006).

Fuels treatments commonly are designed to remove understory biomass and reduce stem density in forests that are outside their historical range of variability, and to clear fuels adjacent to human developments for safety or to protect investments (Plate 4.3). These types of projects are becoming more common. In the western United States, projects designed to restore forests to a condition more representative of the historical range of variability are generally targeted to drier, lower-elevation forests affected by fire suppression (Hessburg et al. 2005), which are not lynx habitat. Lynx habitats in higher-elevation spruce-fir forests have been less affected by past fire suppression and are mostly within the historical range of variability (Agee 2000). Fuels treatments may be needed to protect human communities and capital improvements by reducing the intensity and rate of spread of a fire, affording control actions with a higher probability of success and providing safer conditions for fire fighters. By removing or reducing the understory and ladder fuels to meet those objectives, dense horizontal cover important to snowshoe hares is reduced and habitat value is diminished for hares and lynx.

Prescribed burning is a technique used to reduce tree stem density

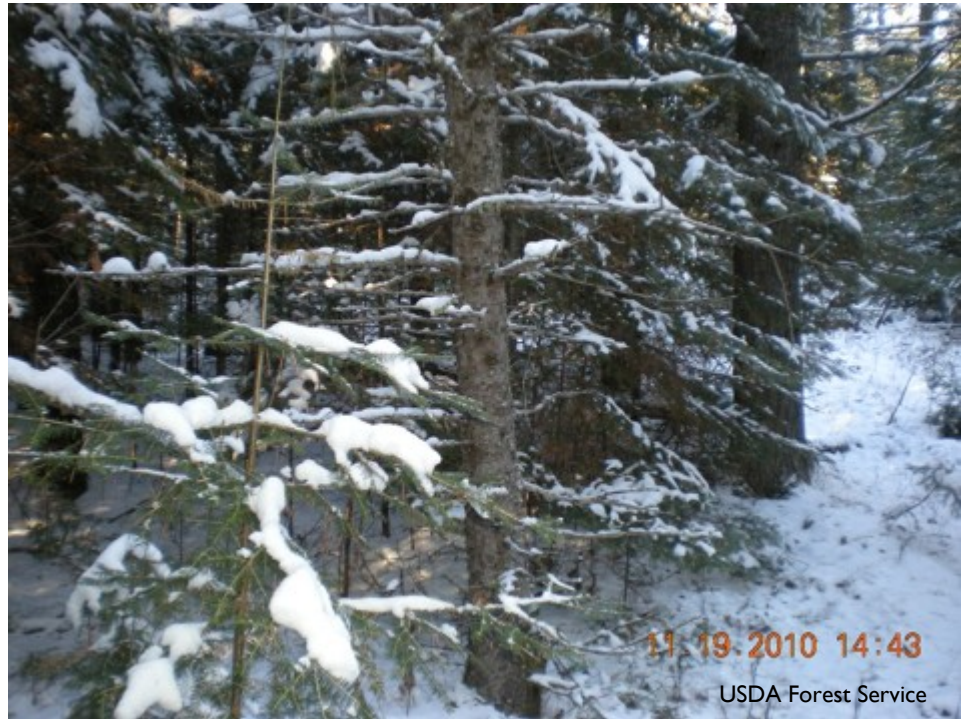


Plate 4.3. Fuels management projects reduce ladder fuels in mature multi-story forests, reduce horizontal cover, and can degrade winter lynx habitat, as shown in these comparison photographs.

and reduce fuels. In the Great Lakes Geographic Area, prescribed burning is used in lynx habitat primarily as a tool to reduce fuels (including from blow-down) and mimic a more natural fire regime in pine forest types (Plate 4.4). In these instances there is a short-term (10–30 years) impact on snowshoe hare habitat. In the western United States, prescribed fire for ecosystem restoration is most applicable to the dry ponderosa pine and Douglas-fir forests that are not lynx habitat. Because spruce-fir forests are generally composed of thinner-barked trees that are easily killed even with light fire, this technique is not used frequently in most lynx habitat.

Biomass removal for energy production targets the removal of dead trees, logging slash, and small-diameter trees and shrubs. Biomass removal is similar to fuels treatments in reducing cover and habitat for snowshoe hares.

Wildland fire management

Fire and other natural disturbance processes historically played an important role in maintaining a mosaic of forest successional stages that provides habitat for both snowshoe hare and lynx (Fox 1978, Bailey et al. 1986, Quinn and Thompson 1987, Koehler and Brittell 1990, Poole et al. 1996, Slough and Mowat 1996). The response of snowshoe hare and lynx in their use of habitat after fires follows a somewhat predictable pattern. For the first few years after a burn, there appears to be a negative correlation between lynx use and the amount of area burned (Fox 1978). This short-term effect is likely a response to a reduction of snowshoe hare populations, reduced cover, and possibly also to increased competition from coyotes in the now-open habitat (Stephenson 1984, Koehler and Brittell 1990). The mid-term (10–40 years post-fire) effect on vegetation in a burned area is development of small tree and shrub cover sufficient for hare populations to reoccupy the area. The length of time varies depending on tree species, potential vegetation, fire severity, and the presence of re-sprouting broadleaf species. Where broadleaf species are denser, hare re-occupancy occurs more quickly (within 3–12 years). Hare population density again decreases as the conifer tree canopy develops and shades out the understory. Forest gap processes, such as tree blowdown, insect infestations, and outbreaks of disease, follow a similar pattern (Agee 2000).

Across the range of lynx, vegetation dynamics differ somewhat as a result of the natural fire frequency and intensity. For example, lynx habitat in the northeastern boreal forests had very long fire-return intervals of



Plate 4.4. Prescribed fire treatments are designed to decrease fuels, but also have the effect of reducing snowshoe hare habitat in the short term (10–30 years in Minnesota), as shown in these comparison photographs.

up to 500 years (Agee 2000). The Great Lakes boreal forests tended to have shorter fire-return intervals of 50–150 years (Heinselman 1996). In much of the Rocky Mountains, the fire regime was more variable in lynx habitat, with both frequent (35–100 years) stand-replacing or mixed-severity fires, and infrequent (200+ years) stand-replacement fires (Hardy et al. 1998). The Cascade Mountains were dominated historically by infrequent (70–150 years) stand-replacing fire regimes (Agee 2000). Disturbance interval and fire severity vary by cover type, with xeric pine types such as lodgepole or jack pine typically experiencing more frequent and more severe fires than mixed-conifer types and spruce/fir.

In the Cascades Geographic Area wildfire has been a significant disturbance influence in lynx habitat. Fires burned more than 50% of suitable lynx habitat in Okanogan County since 1994 (Koehler et al. 2008). In 2006, the Tripod Fire in the Meadows burned 600 km² (20 mi²) of the most contiguous lynx habitat in Washington.

Gayton (2008) reported that recent mountain pine beetle epidemics in British Columbia were the result of a changing climate that contributed to warmer winters and longer growing seasons. Cohen and Miller (2001) and McKenzie et al. (2004) have suggested climate change could affect the extent of bark beetle outbreaks and extent and fire seasons and total area burned in the west.

Land management agencies began effective fire suppression with the advent of aircraft support approximately 70 years ago. Over time, continued fire suppression altered vegetation mosaics and species composition. In jack pine forests of the Great Lakes region, fire suppression changed stand composition and successional pathways (Agee 2000). In the western United States, a shift to uncharacteristically severe and intense wildfires has occurred recently in lower-elevation forests (Quigley et al. 1996, Morgan et al. 1998). However, fire suppression in areas with a history of infrequent fires, as is typical of cool moist forest types such as spruce-fir forests, has probably not had much impact (Habeck 1985, Agee 1993, Schoennagel et al. 2004, Whitlock 2004). This is true across much of the boreal forest in the western United States.

The current goals for vegetation management on federal lands in the United States are to restore ecosystem health, ecological processes, and forest structure, composition, and function appropriate to the site (e.g., USDA Forest Service 2010). Westerling et al. (2006) suggested fuel management and ecological restoration practices will likely not reverse current wildfire trends; large increases in wildfires in the western United States since 1970 resulted from increased temperatures and earlier spring snowmelt. Particularly in the western United States, ecosystem restoration is primarily focused in the dry and mesic forest types at lower elevations, rather than in lynx habitat, and includes reestablishing frequent, low-intensity fire in those systems. Applying ecosystem restoration across a landscape may reduce the risk of uncharacteristic large, stand-replacing fires occurring in the lower-elevation forest types, and thereby prevent their spread into adjacent lynx habitat.

After large dead trees fall to the ground, they provide cover and may enhance lynx foraging habitat in the short term and potential denning habitat in the longer term, depending on post-disturbance stand conditions. Standing snags also may provide sufficient vertical structure and cover to allow lynx to traverse long distances (>1 km [>0.6 mi]) across burned habitat (Maletzke 2004).

Similar to vegetation management, wildland fire management may either diminish, enhance, or sustain the density and distribution of snowshoe hare prey resources and lynx habitat, depending on the design and implementation of programs and actions.

Fragmentation of habitat

We use the term “fragmentation” to describe human-caused alterations of natural landscape patterns that reduce the total area of habitat, increase the isolation of habitat patches, and impair the ability of wildlife to effectively move between those patches of habitat. Fragmentation may be permanent, for example by converting forest habitat to residential or agricultural purposes, or temporary, for example by creating an opening but allowing trees and shrubs to regrow. Fragmentation of habitat accentuates the viability risk inherent in a small population and increases its vulnerability to local extirpation. The combination of human-caused and natural disturbances may exacerbate fragmentation effects.

Lynx habitat in the contiguous United States is inherently patchier than in the northern boreal forest with its

extensive forests, gentle topography, and relatively consistent winter snow conditions (Aubry et al. 2000). The pronounced topographic relief in the mountains of the western United States restricts lynx habitat to a relatively narrow elevational band.

A variety of anthropogenic activities can result in increased habitat fragmentation at the home range or broader scale. For example, permanent or temporary removal of forest cover, development of highways and associated infrastructure, and intensive minerals or energy development can fragment lynx habitat.

Within their home ranges, lynx strongly select for habitat patches that enhance their foraging opportunities (Moen et al. 2008, Vashon et al. 2008a, Fuller and Harrison 2010, Squires et al. 2010). Analysis of winter movements of lynx in Maine indicated that lynx responded to habitat heterogeneity at a coarse scale within their home ranges, by maximizing their access to snowshoe hare prey (Fuller and Harrison 2010). In Montana, lynx selected homogeneous spruce-fir patches that supported snowshoe hares and avoided recent clearcuts or other open patches (Squires et al. 2010). Similarly, in Washington, Lewis et al. (2011) reported that landscapes in which hare habitat was more contiguous, or surrounded by a mosaic of similar habitat quality, supported more hares than did more fragmented landscapes.

Both lynx and hares are influenced by the spatial arrangement of preferred habitat. In Maine and northern Washington, landscapes where habitat was more contiguous supported more snowshoe hares than landscapes that were more fragmented (Simons 2009, Lewis et al. 2011). Several studies (Koehler 1990a, Mowat et al. 2000, von Kienast 2003, Maletzke 2004, Squires and Ruggiero 2007, Squires et al. 2010) have reported that lynx avoid large openings, especially during winter. Mowat et al. (2000) suggested that relatively few snowshoe hares use large openings, and consequently lynx spend little time hunting in these areas. Koehler (1990a) speculated that vegetation management prescriptions that result in distance to cover >100 m (328 ft) may change lynx movement and use patterns until such time as sufficient reestablishment of forest vegetation occurs. Opening size can also influence seedling regeneration and stocking densities (Kreyling et al. 2008).

Fragmentation of the naturally patchy pattern of lynx habitat in the contiguous United States can affect lynx by reducing their prey base and increasing the energetic costs of using habitat within their home ranges. Buskirk et al. (2000a) identified direct effects of fragmentation on lynx to include creation of openings that potentially increase access by competing carnivores, increasing the edge between early-successional habitat and other habitats, and changes in the structural complexities and amounts of seral forests within the landscape. At some point, landscape-scale fragmentation can make patches of foraging habitat too small and too distant from each other to be effectively accessed by lynx as part of their home range. Maintaining preferred habitat patches for lynx and hares within a mosaic of young to old stands in patterns that are representative of natural ecological processes and disturbance regimes would be conducive to long-term conservation.

Highways typically follow natural features such as rivers, valleys, and mountain passes that may have high value for lynx in providing habitat or connectivity. Various studies have documented lynx crossings of highways. A male lynx in western Wyoming was documented to have successfully crossed several 2-lane highways during exploratory movements (Squires and Oakleaf 2005). In Colorado, lynx successfully and repeatedly crossed major highways, including I-70 (J.Squires, personal communication 2012; Ivan 2011b, c, 2012). However, in Alberta, Canada, high road densities, human activity, and associated developments appeared to reduce the habitat quality based on decreased occupancy by lynx (Bayne et al. 2008). Apps et al. (2007) found lynx were 13 times less likely to cross the Trans-Canada Highway relative to random expectation, but only 2.2 and 3.1 times less likely to cross Highway 93 and Highway 1A, respectively, compared to random expectation.

Highways pose a risk of direct mortality to lynx and may inhibit lynx movement between previously connected habitats. If lynx avoid crossing highways, this could lead to a loss of effective habitat within a home range and reduced interaction within a local population (Apps et al. 2007). Lynx and other carnivores may avoid using habitat adjacent to highways, or become intimidated by highway traffic when attempting to cross (Gibeau and Heuer 1996, Forman and Alexander 1998). As the standard of road increases from gravel to 2-lane or 4-lane highways, traffic volumes and the degree of impact are expected to increase. Four-lane highways, such as the interstate highway system, commonly have fences on both sides, service roads, parallel railroads or power lines, and impediments like "Jersey barriers" that make successful crossing more difficult, or impossible, for



Plate 4.5. Jersey barriers in the medians or along the shoulders of highways and fenced areas adjacent to highways may impede movement of lynx between habitat patches.

wildlife (Plate 4.5). Alexander et al. (2005) suggested traffic volumes between 3,000 and 5,000 vehicles per day may be the threshold above which successful crossings by carnivores are impeded.

Between 2000 and 2011, 27 lynx were reported to have been killed on roads (both paved and unpaved) in Maine (Vashon et al. 2012), 4 in Minnesota (U. S. Fish and Wildlife Service 2012), 1 in Idaho and 1 in Montana (K. Broderdorp, U.S. Fish and Wildlife Service, personal communication 2012). Between 1995 and 2011, 15 lynx were reported killed on British Columbia highways (British Columbia Wildlife Accident Reporting System 2012).

Translocated animals may be more vulnerable to highway mortality than resident lynx (Brocke et al. 1990), because they often move extensively after their release and are unfamiliar with their surroundings. In the Adirondack Mountains of New York, an attempt to reintroduce lynx failed and 18 of 37 mortalities of translocated animals were attributed to road kills (Brocke et al. 1990). Over a 7-year period in Colorado, 13 of 102 translocated lynx were killed on highways (Devineau et al. 2010). Traffic volumes on Colorado highways where the 13 lynx mortalities occurred were estimated to range from about 2,300 to >25,000 vehicles per day (K. Broderdorp, personal communication 2012).

Coordination of management across international, federal, state, county, and private land boundaries is essential to minimize fragmentation. Connectivity to source populations in Canada is considered critical to persistence of populations in most parts of the range in the United States (Federal Register Vol. 68 pp. 40076–40101, Squires et al. 2013).

Second tier of anthropogenic influences

The following 6 anthropogenic influences are placed in the lower tier, indicating that they are judged to have less impact on lynx and lynx habitat or are the responsibility of agencies other than the federal land management agencies. Regulations that are already in place may have reduced the impacts on lynx, or the nature of the activity confers a lesser impact.

Incidental trapping

Like most felids, lynx are very vulnerable to trapping and snaring and can be easily overexploited (Mech 1980, Carbyn and Patriquin 1983, Parker et al. 1983, Ward and Krebs 1985, Bailey et al. 1986, Quinn and Thompson 1987, Slough and Mowat 1996). In Canada during a snowshoe hare decline, rates of trapping mortality of lynx were positively related to average pelt value, and appeared to be additive to nontrapping mortality (Brand and Keith 1979).

State wildlife management agencies regulate the trapping of furbearers. Trapping and snaring of lynx is currently prohibited across the contiguous United States. Incidental trapping or snaring of lynx can occur in areas where regulated trapping for other species, such as wolverine, coyote, fox, fisher, marten, bobcat and wolf, overlaps with lynx habitats (Plate 4.6; Mech 1973, Carbyn and Patriquin 1983, Squires and Laurion 2000, U.S. Fish and Wildlife Service unpublished data 2011, U. S. Fish and Wildlife Service 2012, Vashon et al. 2012).

Lynx that were captured in the United States for research projects have subsequently been killed in traps or snares in Canada (Moen 2009, Vashon et al. 2012).

In Maine from 2000-2012, 59 lynx were reported captured in traps set for other furbearers (snares were not legal), of which at least 6 were mortalities (Vashon et al. 2012). In Minnesota during the same time period, 22 lynx were reported captured in traps and snares, of which at least 12 were killed (U.S. Fish and Wildlife Service 2012). In Montana, 10 lynx were reported trapped, of which at least 4 died. Two lynx were trapped in Idaho, 1 in 2012 (B. Waterbury, Idaho Department of Fish and Game, personal communication 2013) and 1 in 2013 (M. Lucid, Idaho Department of Fish and Game, personal communication 2013), 1 of which died. Lynx were also incidentally trapped and snared in New Brunswick and Nova Scotia where they are a protected species. These figures reflect the reported captures only.



Plate 4.6. Trapping for lynx is not legal in the contiguous United States. However, traps set in lynx habitat that target other furbearing species, such as fishers, coyotes, wolverine, and bobcats, can result in an incidental capture of lynx.

The total number of mortalities due to incidental trapping is unknown. Moen (2009) investigated the proportion of radiocollared animals that were represented in the total number reported to FWS in Minnesota. In comparison to incidental shooting and vehicle collisions, proportionately fewer mortalities of non-collared lynx were reported due to incidental trapping, suggesting that trap-related mortalities may be underreported (Moen 2009).

Although many incidentally trapped lynx were reported to have been released, the physical condition of the released animals and the effect on animal fitness are unknown. Depending on environmental conditions and the types of traps used, a substantial portion of lynx caught in foothold traps may experience injuries and foot freezing (Mowat et al. 1994, Nybakk et al. 1996, Kolbe et al. 2003). Some trap-related injuries (e.g., dislocations, fractures, mild freezing) are difficult to detect in lynx in the field (Mowat et al. 1994). Injuries and mortality rates are greatest to lynx incidentally caught in snares and Conibear traps.

Injuries and mortalities related to incidental trapping can be minimized through various techniques. Avoiding areas where lynx are present, avoiding use of suspended flags or sight-attractants near traps, avoiding drag sets and anchoring traps with short chains (Mowat et al. 1994) and multiple swivels, using padded foothold traps or traps with offset jaws (Olsen et al. 1988, Houben et al. 1993, Association of Fish and Wildlife Agencies 2011), employing boxes or other devices to exclude lynx from Conibear traps (U.S. Fish and Wildlife Service 2011), and trapping when temperatures are above -8°C (18°F ; Mowat et al. 1994) are recommended. Daily checking of traps can minimize freezing injuries and starvation. Several states including Maine, Minnesota, and Montana have implemented special regulations to reduce the likelihood of incidental capture of lynx in traps set for other furbearers.

State wildlife agencies have effectively used trapper outreach such as training, DVDs, and mailings, as a tool to avoid or minimize incidental take of lynx. Some states also have protocols to quickly respond to lynx in traps (e.g., 24-hour hotline) and have trained personnel ready to evaluate trapped lynx and assist with release or rehabilitation.

No conservation measures to address incidental trapping are included in this document because trapping is regulated by the states.

Recreation

Trends in recreation. Cordell et al. (2009) compared the results of national recreation surveys conducted during 1982–1983, 1994–1995, 1999–2001, and 2005–2009. In terms of both the number of people and percentage of population, participation in outdoor recreation has continued to grow in the United States. Over the years, walking outdoors has been the most popular activity, with 194 million participants currently. Activities gaining more than 50 million participants between 1982–83 and 2005–09 were viewing or photographing wild birds (an increase of 287%), attending outdoor sports events (an increase of 74%), and day hiking (an increase of 210%). Downhill skiing increased by 4.4% to 14.8 million participants, and snowmobiling increased by 3.5% to 8.7 million participants. Cross-country skiing declined by about 5.8% over the same period. Social trends may have cycles that are influenced by economic conditions, technology changes, population growth, cultural evolution, and other factors, making it difficult to project future trends.

Mechanisms of effects. Our understanding of the effects of outdoor recreation on lynx and their habitat is incomplete. The effects, if any, may depend on the type of activity and the context within which it occurs. Mechanisms through which recreational activities could impact lynx may include loss of habitat, reductions in habitat availability due to disturbance, or changes in competition for snowshoe hare prey.

Habitat loss. Construction or expansion of developed areas such as large ski areas and 4-season resorts, as well as smaller recreational sites like nordic ski huts or campgrounds, may directly remove forest cover. Such removal in lynx habitat could decrease prey availability, affect lynx movement within home ranges, or result in a more fragmented landscape.

Disturbance. Few studies have examined how lynx react to human presence. Some anecdotal information suggests that lynx are quite tolerant of humans, although given differences in individuals and contexts, a variety of behavioral responses to human presence may be expected (Staples 1995, Mowat et al. 2000). Preliminary information from winter recreation studies in Colorado indicates that some recreation uses are compatible, but lynx may avoid some developed ski areas (J. Squires, personal communication 2012).

Some wildlife species have been found to be more sensitive to disturbance when bearing and rearing young than in other times of the year. Olson et al. (2011) reported they approached 8 dens of females; half of the females moved their dens within 4 days, while the other half did not move dens for at least 20 days following disturbance. Olson et al. (2011) noted that lynx dens were located in more remote areas and unlikely to be disturbed by humans. Frequent movement of kittens from natal dens to 1 or more maternal dens is normal behavior exhibited by lynx even in the absence of human disturbance (J. Squires, personal communication 2012).

Changes in competition for snowshoe hare prey. Packed trails created by snowmobiles, cross-country skiers,

snowshoe hares, and other predators might serve as travel routes for potential competitors and predators of lynx, especially coyotes (Plate 4.7; Bider 1962, Ozoga and Harger 1966, Murray and Boutin 1991, Koehler and Aubry 1994, Murray et al. 1995, and Buskirk et al. 2000a). Unique morphological differences between coyotes and lynx would appear to spatially segregate these species by snow conditions (Murray and Boutin 1991, Litvaitis 1992), with coyotes at a disadvantage in deep, soft snow due to their high foot-load (the ratio of body mass to foot area; Murray et al. 1994). Buskirk et al. (2000a) hypothesized that the natural spatial segregation of lynx and coyotes in winter could break down where human modifications to the environment allow coyotes to access deep snow areas.



The strength of this hypothesis rests on 2 primary assumptions: a) that the presence of compacted snow resulting from certain recreational activities leads to increased coyote use of or access to lynx habitat; and b) that such increased use or access reduces prey availability to lynx or increases interference interactions. Some studies suggest that coyotes select for snow conditions that are shallower, more supportive, and characterized by low sinking depth (Murray and Boutin 1991, Thibault and Ouellet 2005). Coyote use of more supportive snow may reduce the relatively high energetic cost of travel in and avoidance of deep snow conditions (Crete and Lariviere 2003).

Plate 4.7. Snow may be compacted by recreational activities. Continually compacted trails as a result of grooming may provide access into areas with deep snow for other predators such as coyotes.

Studies of coyote use of compacted snowmobile trails have yielded variable results. In Montana, Kolbe et al. (2007) snow-tracked coyotes and found that although they did use snowmobile trails, they did not travel closer to these trails than randomly expected. Rather, coyotes adapted to deep snow conditions by selectively using habitats with shallower and more supportive snow (Bunnell et al. 2006, Kolbe et al. 2007), corroborating observations made by others (Murray and Boutin 1991, Crete and Lariviere 2003, Thibault and Ouellet 2005, Burghardt-Dowd 2010). Further, coyotes in the Kolbe et al. (2007) study did not use compacted roads any more than uncompacted roads, suggesting that coyotes may have used roads because they provide a “cleared travel corridor” whether they are compacted or not.

In contrast, the distribution of coyotes in Utah and Wyoming appeared to be influenced by proximity to compacted snowmobile trails in deep, powdery snow areas (Bunnell et al. 2006, Burghardt-Dowd 2010). Bunnell et al. (2006) observed more coyote activity along trails compacted by snowmobiles than those that were not. Burghardt-Dowd (2010) applied methods used by Kolbe et al. (2007) in western Wyoming and similarly found that coyotes selected shallower snow when off compacted trails than randomly expected. However, coyotes in her study area also traveled closer to compacted snowmobile trails than would be expected. The seemingly contradictory results from Kolbe et al. (2007) and Burghardt-Dowd (2010) might be attributable to differences in snow penetrability between the 2 geographic areas. Average snow penetrability measured using the same method was higher in northwestern Wyoming (Burghardt-Dowd 2010) than in Montana (Kolbe et al. 2007), making coyote movement in the absence of artificially compacted snow potentially more energetically costly in Wyoming. Based on these studies, it appears that snow column density and the number of freeze/thaw events in different regions may influence coyote movements and habitat selection (Burghardt-Dowd 2010). That is, snow penetrability in the region may determine whether or not snowmobile trails influence coyote movement patterns in lynx habitats (Bunnell et al. 2006, Kolbe et al. 2007, Burghardt-Dowd 2010).

Regarding the second assumption, if snow compaction assists coyote movement during winter, does this result in reduced prey for lynx? Coyotes are found throughout the majority of the boreal forest ecosystem (Bekoff and Gese 2003) including areas inhabited by lynx (O'Donoghue et al. 2001, Kolbe et al. 2007, Burghardt-Dowd 2010). Unlike lynx, coyotes demonstrate strong prey- and habitat-switching abilities (Buskirk 2000). In the Yukon, coyote and lynx winter diets overlapped most during a peak in hare densities and least during periods of low hare densities (O'Donoghue et al. 2001).

In Maine, hares represented 37% of the winter diet of coyotes in a study on the Maine eastern coast (Major and Sherburne 1987), outside of lynx habitat. Litvaitis and Harrison (1989) reported that snowshoe hares composed 39% of the winter diet of coyotes in a western Maine study in lynx habitat. However, there is no indication that lynx were present in this study area at the time of the study, making it difficult to infer whether or not competition between coyotes and lynx might have occurred.

In Montana, coyotes primarily scavenged ungulate carrion, and killed snowshoe hares at only 3 of 88 documented feeding sites (Kolbe et al. 2007). Dowd and Gese (2012) analyzed 470 coyote scats and 24 lynx scats (from 5 individual lynx) in northwestern Wyoming and reported that coyotes scavenged primarily on mule deer or elk (*Cervus elaphus*) carrion in winter; only 3.5% of scats contained remains of snowshoe hares during winter. As expected, lynx preyed mostly on snowshoe hares in winter, with 85% of prey items consisting of snowshoe hares. Thus in both Montana and Wyoming, there was not a significant dietary overlap during winter between these species. In Wyoming, the potential for competition between lynx and coyotes would be most likely to occur during the fall when coyotes appear to increase predation on snowshoe hares (Burghardt-Dowd 2010).

Existing information suggests that some low level of competition for prey could occur naturally between lynx and coyotes. However, this is apt to vary spatially or temporally depending on overall prey availability and composition. Research that could conclusively demonstrate and quantify the effects of competition would be challenging due to numerous confounding factors.

Likely effects of specific winter recreational activities on lynx.

Ski areas and 4-season resorts. More than 50 ski areas exist throughout the range of the lynx in the contiguous United States. Most ski areas are located on north-facing slopes, where ample snow conditions provide for extended ski/snowboard recreational seasons. In the western states, many of these landscapes feature spruce-fir forests.

While ski resorts occupy a small proportion of the landscape, spruce-fir forests provide important stable habitat for snowshoe hares and lynx at the southern extent of their range. In winter, alpine and Nordic skiing and snowboarding are the primary uses. Most of these resorts offer year-round recreation, with summer activities typically including hiking and mountain biking.

Ski resort development may fragment the forested landscape (Plate 4.8). One ski run is often separated from the next only by small inter-trail forest is-



Plate 4.8. Ski resorts and associated human developments may fragment forest landscapes by removing cover, reducing snowshoe hare abundance, and impeding lynx movement.

lands. Ski runs often are intermixed with other open areas such as open or gladed bowls, rock outcrops, or barren tundra ridges. Ski resorts that are built or expanded in lynx habitat may impact lynx by removing forest cover, reducing the snowshoe hare prey base, and creating or increasing human disturbance in or near linkage areas.

There is limited information on lynx behavior and habitat use in and around ski areas. Lynx have been known to incorporate smaller ski resorts within their home ranges, but may not utilize the large resorts. Preliminary information from an ongoing study in Colorado suggests that some recreation use may be compatible, but lynx may avoid some areas with concentrated recreation use. In some areas, lynx habitat may be limited and concentrated in the ski area development footprint (J. Squires, personal communication 2012).

Snowmobile warming huts and Nordic ski huts. Most backcountry ski hut sites are primitive in nature. Some facilities may have utilities, summer road access, and on-site storage for grooming equipment and fuel. Use by snowmobile clubs and the general public is often focused or concentrated around these sites. Many have developed trail systems that loop around the site or provide access to other remote areas.

These facilities are generally located along designated cross-country ski and snowmobile routes. Users compact the snow along the route to and from the huts and in the immediate vicinity. Off-trail travel has the potential to create larger areas of compacted snow. However, as indicated above, this local snow compaction is short term and not likely to change the competitive interactions between lynx and coyotes.

Developed campgrounds. Typically these are single-season summer facilities that might provide limited winter use, and generally supply such amenities as water and holding tanks for sewage disposal. Access could be further facilitated through the plowing of roads. When located in lynx habitat, the effects might be similar to those described for Nordic ski huts and snowmobile huts.

Minerals and energy exploration and development

Leasable minerals. Activities associated with exploration and development of leasable minerals could affect lynx habitat by changing or eliminating the native vegetation and contributing to habitat fragmentation. Development of a high density of wells, as is typical of coal-bed methane development (e.g., 1 well per 2–4 ha [5–10 ac]), could affect lynx by directly removing habitat. The development of associated roads, powerlines, and pipelines to facilitate exploration and development could also result in a loss of lynx habitat and contribute to fragmentation of habitat. In some areas, for example in the Wyoming Range, extensive oil and gas development is occurring within lynx habitat.

Locatable minerals. Only a fraction of the historical number of mines is operating today; those that continue to operate do so with more stringent environmental protection measures. However, in some parts of the United States, minerals exploration and new development appear to be on the rise. Activities associated with exploration and development of locatable minerals could affect lynx habitat by changing or eliminating the native vegetation, and by contributing to habitat fragmentation. Amount of impact can be variable depending on the size of the associated mining operation or development. Locatable minerals are extracted through both open pit and sub-surface mines with potential habitat alteration ranging from tens to thousands of hectares. In some instances, such as larger mining operations, land exchanges are conducted to consolidate private ownership of the surface above a deposit prior to mine development. Depending on lands exchanged this could retain lynx habitat in public ownership, but could still result in a net loss of habitat. Development of road and railroad access to facilitate exploration and development could also directly impact lynx habitat, contribute to fragmentation, facilitate increased competition as a result of snow-compacted routes, and result in direct mortality. Despite these potential impacts, mining exploration and development is generally anticipated to affect only a small portion of lynx habitat in the contiguous United States.

Salable minerals. In general, salable minerals are found close to the surface. During exploration activities, equipment is moved to the site and a number of test pits are dug or holes drilled to determine the quality of material. If desired minerals are found in suitable quantity, then vegetation is removed and materials are excavated.

Areas developed for salable minerals can vary in size from a single truck load to tens of acres. Impacts to lynx could include the potential alteration or removal of lynx habitat, increased fragmentation, and the potential for human-caused mortality from road development.

Wind energy. Wind energy development and associated transmission lines in lynx habitat is increasing across the nation. Facilities are located on ridge tops or other areas exposed to consistent wind. The construction of wind facilities including access roads may result in loss of lynx habitat and increased fragmentation from permanent forest clearings. Noise and human activity associated with operation of wind facilities would likely continue through the life of the project, which may exceed 20 years.

Utility corridors. Utility corridors contain developments such as overhead or buried powerlines and gas pipelines, and often are located within or adjacent to existing road rights-of-way. Utility corridors potentially could have short- or long-term impacts to lynx habitats, depending on location, type, vegetation clearing standards, and frequency of maintenance. Those that are extensively cleared of vegetation and maintained in a low structure condition, likely equate to a permanent habitat loss. When associated with highways and railroads, utility corridors may further widen the right-of-way. Utility corridors may facilitate human access into previously remote areas.

Illegal shooting

Lynx can be mistakenly shot by legal hunters or illegally killed by poachers. The actual magnitude of shooting mortality is unknown. In Canada, incidents were reported by Saunders (1963b), Parker et al. (1983), and Slough and Mowat (1996). In Maine, 5 lynx were reported shot (Vashon et al. 2012). In Minnesota, 1 of 17 radiocollared lynx that are known to have died was shot (Moen 2009); a total of 6 lynx were reported shot over about a 10-year period in that state (U.S. Fish and Wildlife Service 2012). Two lynx were reported poached by lion hunters in Montana, and 1 lynx was reported shot in Washington (U.S. Fish and Wildlife Service 2001). In the first 10 years of the reintroduction project in Colorado, Devineau et al. (2010) reported that 14 of 102 (14%) of lynx mortalities were attributable to illegal shooting, with another 5 that were probably shot.

No conservation measures were developed to address illegal shooting. Misidentification errors can be reduced by disseminating information about where lynx occur and providing education to hunters about the characteristics that can be used to distinguish lynx from bobcats. This is being done by state wildlife agencies.

Forest/backcountry roads and trails

This section addresses transportation and distribution systems on public lands. Forest and backcountry roads are typically low-speed (<56kph [<35 mph]), single- or double-lane gravel or paved roads. Extensive (>600 km) backtracking studies found that lynx did not avoid gravel forest roads (Squires et al. 2010). Trails are typically narrow routes with a native surface; there is no information to suggest that trails have negative impacts on lynx.

Construction of roads results in a small reduction of lynx habitat by removing forest cover. In some instances, vegetation along less-traveled roads provides good snowshoe hare habitat, and lynx may use the roadbed for travel and foraging (Koehler and Brittell 1990). Similar to McKelvey et al. (2000d), Squires et al. (2010) concluded that forest roads with low vehicular or snowmobile traffic had little effect on lynx seasonal resource-selection patterns in Montana. In Maine, Fuller et al. (2007) documented lynx traveling on roads (unplowed during winter), but determined that roads and their associated edges were selected against within home ranges. Lynx may have exhibited negative selection for road edges because these areas were associated with the lowest density of conifer saplings and hare abundance compared to all other stand types.

Squires et al. (2008) reported that lynx denned farther from all roads compared to random expectation. Lynx occupy dens in early May when many forest roads are still impassable by wheeled vehicles due to persistent snowdrifts and wet, muddy roads; snowmobiles no longer used the roads because of intermittent and unpredictable availability of sufficient snow (Squires et al. 2008). They concluded that lynx did not avoid the subset of roads that were open to wheeled vehicle travel. Rather, the observed avoidance of roads was more a function of the correlation of roads and landscape pattern; fewer roads were located in denning habitat and higher road density occurred along forest edges and in managed stands, which lynx avoided (Squires et al. 2010).

In Minnesota, Moen et al. (2010b) found that lynx selected for roads during long-distance movements. Roads may not have been essential to these movements, but lynx appeared to benefit energetically from the use of these linear features.

There have been no documented mortalities on low-use forest roads in Washington; however, several have occurred in Maine and Minnesota. The private forest roads in Maine have a higher traffic volume and faster speeds than many national forest road systems in lynx habitat. Twelve of 27 lynx mortalities on roads in Maine between 2000 and 2011 occurred on forest roads (Vashon et al. 2012). In Minnesota, between 2000 and 2011, 2 lynx were killed on backcountry railroads, and 2 on unpaved forest roads (U.S. Fish and Wildlife Service 2012). Backcountry roads also provide human access into lynx habitat where incidental trapping or illegal shooting can occur.

Grazing by domestic livestock

Grazing by domestic sheep, goats and cattle is common in the western United States. There is little scientific information available about dietary overlap with, or competition between, livestock and snowshoe hares, or the response of snowshoe hares to livestock grazing. If there were significant forage competition, this could have an indirect impact on lynx by reducing its prey base.

As discussed in Chapter 2, the summer diet of snowshoe hares is dominated by herbaceous food including forbs, grasses, and leaves of shrubs. The winter diet is restricted to woody browse, including smaller-diameter twigs, branches, small stems and evergreen needles of shrubs and trees (Adams 1959, Wolff 1978, Koehler 1990a, Hodges 2000a). The habitats used by snowshoe hare that are most likely to be affected by livestock grazing are riparian willow and aspen communities.

High-elevation riparian areas dominated by willows have been shown to provide important summer and fall habitat for lynx in Colorado (Shenk 2008). In Wyoming, Berg and Gese (2012) found hare use during the summer of small patches of forest surrounded by non-forest vegetation containing willow. Overbrowsing by domestic livestock or wild ungulates that altered the structure or composition of the native plant community, particularly by impacting willows, could negatively affect snowshoe hare habitat.

Overall, grazing or browsing by domestic livestock on federal lands is unlikely to reduce the snowshoe hare prey base or have a substantial effect on lynx. Grazing/browsing could have some localized effects on high-elevation willow communities or aspen stands if not managed appropriately.

Chapter 5– CONSERVATION STRATEGY

Approach to development of conservation measures

The following conservation measures are intended to apply to lynx habitat on federal lands. The assessment contained in the previous chapters addressed all aspects of lynx ecology and comprehensively considered potential lynx responses to various anthropogenic influences, in order to provide a full context for federal management actions. The conservation measures in this chapter are focused on those programs and activities under the jurisdiction of the federal agencies.

In all geographic areas, some lynx habitat falls within state and private lands. In the Northeast Geographic Area, lynx habitat in Maine occurs almost entirely on privately-owned industrial forest lands. Guidelines have been developed for use by private landowners who may wish to manage their lands in a manner that benefits lynx. Various examples are available; the Maine guidelines are available at: <http://www.fws.gov/mainefieldoffice/PDFs/Canada%20lynx%20habitat%20management%20guidelines%20for%20Maine%209.13.07.pdf>.

We used current knowledge about lynx, their primary prey (snowshoe hares) and basic principles for maintaining or restoring native ecological processes and patterns to develop the conservation measures. The information and the standards and guidelines contained in the 2000 edition of the LCAS were reviewed in light of new information on lynx and snowshoe hares, with emphasis on peer-reviewed published information. An important change from the 2000 edition of the LCAS is that separate objectives and conservation measures were developed for core areas and secondary/peripheral areas (as identified in the recovery outline, U.S. Fish and Wildlife Service 2005), rather than applying the same guidance throughout mapped lynx habitat. The intent is to assist managers in prioritizing conservation efforts.

We identified conservation measures that address those anthropogenic influences identified and described in Chapter 4 that are within the authority and jurisdiction of federal agencies. This set of conservation recommendations may not cover all possible actions, in all locations across the broad range of the lynx. The measures may not be applicable in all settings. The unique circumstances of individual projects or settings will be considered during project analysis and design. If a particular project would result in different effects on lynx than would be expected in a more typical setting, then the measures can and should be adjusted as needed to achieve the desired objectives for lynx conservation.

Lynx Analysis Units

Lynx Analysis Units (LAUs) are intended to facilitate analysis and monitoring of the effects of management actions on lynx habitat. LAU boundaries are not to be adjusted for individual projects, but must remain constant to be effective for their intended purposes of planning and monitoring.

LAUs are a tool to guide management that will support a reproductive population of lynx in core areas. It is not necessary to delineate LAUs in secondary/peripheral areas.

LAUs do not depict actual lynx home ranges, but should approximate the size of a female's home range and contain year-round habitat components. Females have smaller home ranges than males and are more restricted in

their movements during the period of kitten dependency. Maintaining good quality and distribution of denning and foraging resources within a LAU will help to assure survival and reproduction by adult females, which is critical to sustain the overall lynx population.

Certain conservation measures are applied across a LAU to encourage well-distributed lynx habitat throughout the landscape. In some cases, project impacts will need to be assessed across 2 or more LAUs to fully address direct, indirect, and cumulative impacts of particular actions. Naturally-occurring events such as lightning-ignited stand-replacing wildfires may create change across many adjoining LAUs.

Lynx habitat mapping and the delineation of LAUs should be completed using criteria specific to each geographic area. Primary vegetation will include those forest types necessary to support lynx survival and reproduction. Because lynx are highly mobile, it is recognized that other vegetation types when intermixed with the primary vegetation may also be used by lynx. However, these are only considered to contribute to lynx habitat where they are associated with the primary vegetation in that geographic area.

As stated above, the size of the LAU reflects female lynx home range size in the geographic unit. A sufficient amount of lynx habitat must be present within the LAU to support a female lynx. For example, in the western United States, it appears that at least 26 km² (10 mi²) of primary vegetation (e.g., spruce/fir) must be present.

The arrangement of habitat within the LAU should take into consideration the daily movement distances of resident females. When delineating LAUs, small patches of primary vegetation located beyond daily movement distances could be discarded or incorporated into a neighboring LAU. Since the LAU represents a hypothetical female home range, and is the basis for analysis, it can be larger and contain more lynx habitat than an actual home range.

Lynx habitat was identified using criteria described in the 2000 LCAS. In some areas, better information on identifying lynx habitat is currently available. Where new vegetation databases will improve identification of lynx habitat, we encourage updating maps. Where information in new maps suggests LAUs need adjusting, coordinate changes with FWS.

Core areas and secondary/peripheral areas

The recovery outline (U.S. Fish and Wildlife Service 2005) stratified lynx habitat into 3 categories: core, secondary, and peripheral areas (Fig. 3.1). The Southern Rockies was identified as a “provisional” core area because of the uncertain status of the reintroduced population. Here we have treated core and provisional core areas the same, and use only the term core area.

Core areas are places where long-term persistence of lynx and recent evidence of reproduction have been documented. Based on historical lynx occurrence information (McKelvey et al. 2000b), recent research (e.g., Hoving 2001, Squires et al. 2003, von Kienast 2003, Maletzke 2004, Fuller et al. 2007, Burdett 2008, Koehler et al. 2008, Vashon et al. 2008a, Devineau et al. 2010, and Squires et al. 2010), results from the National Lynx Survey (K. McKelvey, unpublished data), and snow tracking surveys (Plate 5.1), evidence of persistence and reproduction of lynx in the core areas has been confirmed. Delineation of core areas may be refined in the future if supported by new information.

The contribution of lynx occurring outside of core areas to population dynamics and persistence within core areas is unclear. It has been suggested that secondary and peripheral areas might contribute to lynx persistence by sup-



Ben Maletzke



Ben Maletzke

Plate 5.1. Lynx tracks in the snow are readily detected when lynx are present in an area. Putative bobcat and lynx tracks on the left photo show how lynx can more easily travel across soft snow. Back-tracking can be used to locate hair or scat samples for DNA analysis.

porting successful dispersal or exploratory movements. Lynx habitat in secondary/peripheral areas appears to be inherently more patchy and less productive than in core areas.

Historical information suggests that lynx were much less likely to occupy these areas over time, and many records appear to have a time lag following cyclic irruptions of lynx populations in Canada. We do not anticipate that secondary/peripheral areas will support home ranges and reproduction over time. We speculate that the amount and quality of habitat required to support an independent adult or subadult disperser is less than is necessary to support reproduction and sustain a local population. During an incursion of lynx from the north, it is possible that some individuals could survive in secondary/peripheral areas for a time and later colonize vacant habitat in a core area. In this way, these areas could be important in maintaining or enhancing genetic diversity.

Conservation measures for core areas and for secondary/peripheral areas are presented separately below.

Relationship of the LCAS to land management plans

Management direction to conserve lynx and lynx habitat has been adopted into land management plans by federal agencies across most of the range of lynx in the contiguous United States. This direction was developed in accordance with the National Forest Management Act (NFMA) of 1976 and the Federal Land Policy and Management Act (FLPMA) of 1976, which require public review and comment as part of the decision-making process.

In accordance with the NFMA, projects must be consistent with the management direction contained in the forest plan. The NFMA regulations (36 CFR 219.22) require the responsible official to consider the best available science in plans.

The conservation measures in the LCAS provide updated information that will complement and be useful in implementing land management plans, and may serve to inform future updates or refinements of existing plans.

Relationship to designated critical habitat

In the Remanded Rule, the FWS described lynx habitat as boreal forest where there are cold winters with deep snow (Federal Register Vol. 68 pp. 40076–40101). Lynx habitat has been further characterized in Chapter 2 as boreal forest with gentle rolling topography, dense horizontal cover, deep snow, and moderate to high (>0.5 hares/ha [0.2 hares/ac]) snowshoe hare densities.

In 2009, the FWS designated critical habitat for lynx (Federal Register Vol. 74 No. 36 pp. 8616–8701). In the 2009 rule, the primary constituent element of lynx habitat was defined as boreal forest landscapes supporting a mosaic of differing successional forest stages and containing:

- Presence of snowshoe hares and their preferred habitat conditions, which include dense understories of young trees, shrubs or overhanging boughs that protrude above the snow, and mature multi-story stands with conifer boughs touching the snow surface;
- Winter snow conditions that are generally deep and fluffy for extended periods of time;
- Sites for denning that have abundant coarse woody debris, such as downed trees and root wads; and
- Matrix habitat (e.g., hardwood forest, dry forest, non-forest) that occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel through such habitat while accessing patches of boreal forest within a home range.

LAUs contain a mix of lynx habitat as well as the matrix as defined in the 2009 rule designating lynx critical habitat. Since the matrix provides limited snowshoe hare resources or other life requisites for lynx, no conservation measures were developed that specifically address management of matrix, except as related to maintaining connectivity.

Core areas: conservation measures

Refer to the recovery outline (Fig. 3.1; U.S. Fish and Wildlife Service 2005) for the locations of identified core areas. We note that core areas may be refined in the future to reflect more recent information on lynx distribution and habitat use. As core area delineations and lynx habitat maps continue to be refined, we expect that the areas to which conservation measures are applied will change accordingly.

Conservation measure applicable to core areas:

- Delineate LAUs within the core areas. Using the best available mapping tools, assess the abundance and juxtaposition of lynx habitat, and ensure that adequate amounts of lynx habitat are present within each LAU. If not, redelineate the LAU in coordination with FWS to encompass additional lynx habitat, eliminate the LAU, or combine LAUs as appropriate.

Vegetation management

Winter is the most constraining season for lynx and snowshoe hares. Dense horizontal cover of conifers above the snow level is critical to support snowshoe hares in winter. Vegetation management should be designed to provide for winter snowshoe hare habitat as forest stands develop successionally over time.

Fires, insect epidemics, and some types of timber harvest cause the boreal forest to revert to early stand initiation structural stage, which is a temporary condition that does not provide dense cover and food for snowshoe hares, nor does it provide foraging habitat for lynx. Over time, (20–30 years or so depending upon the site) trees will grow tall enough and dense enough to once again provide food and cover for snowshoe hares in winter.

In some areas in the southern part of their range, lynx populations appear to be limited by the availability of snowshoe hares, as suggested by large home range sizes, high kitten mortality, and greater reliance on alternate prey, further highlighting the importance of the following conservation measures. Ruggiero et al. (2000b) recommended maintaining some minimum density of snowshoe hares across a broad landscape, e.g., >0.5 hare/ha (>0.2 hares/ac), to support a self-sustaining population of lynx.

Conservation measures for vegetation management (cont. on next page):

- Provide a mosaic that includes dense early-successional coniferous and mixed-coniferous-deciduous stands, along with a component of mature multi-story coniferous stands to produce the desired snowshoe hare density within each LAU (Plate 5.2).

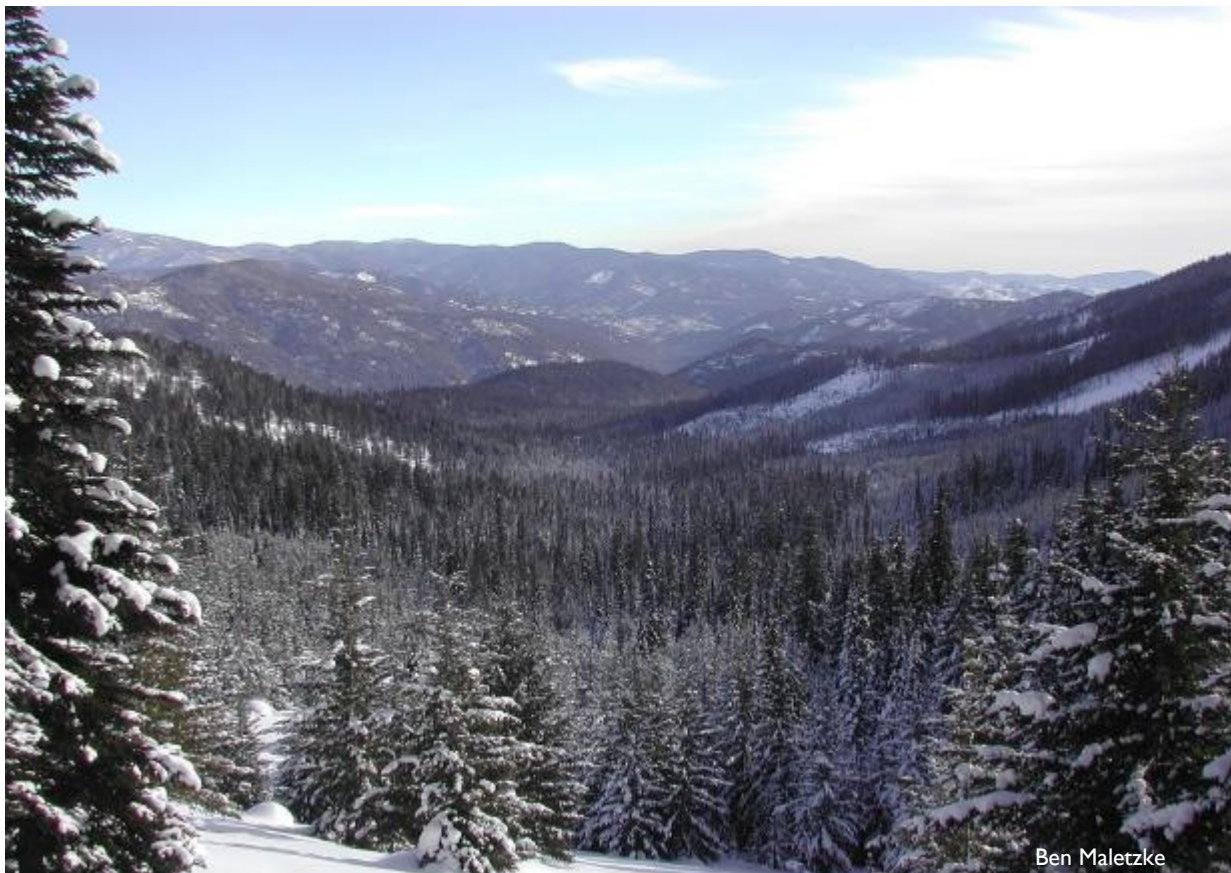


Plate 5.2. Lynx habitat in a landscape providing a variety of forest structures, including mature forests and mid- and early-successional forests, interspersed with openings.

Conservation measures for vegetation management (cont.):

- Use fire and mechanical vegetation treatments as tools to maintain a mosaic of lynx habitat, in varying successional stages, distributed across the LAU in a landscape pattern that is consistent with historical disturbance processes.
- Design vegetation management to develop and retain dense horizontal cover. Focus treatments in areas that have the potential to improve snowshoe hare habitat by developing dense horizontal cover in areas where it is presently lacking. In areas of young, dense conifers resulting from fire, timber harvest or other disturbance, do not reduce stem density through thinning until the stand no longer provides low, live limbs within the reach of hares during winter (e.g., self-pruning processes in the stem exclusion structural stage have eliminated snowshoe hare cover and forage availability during winter conditions with average snowpack). If studies are completed that demonstrate that thinning can be used to extend the duration of time that snowshoe hare habitat is available (e.g., by maintaining low limbs), then earlier thinning could be considered.
- Retain mature, multi-story conifer stands that have the capability to provide dense horizontal cover (Plate 5.3). If portions of these stands currently lack dense horizontal cover, focus vegetation management practices (such as group selection harvest) in those areas to increase understory density and improve snowshoe hare habitat.
- To maintain the amount and distribution of lynx foraging habitat over time, manage so that no more than 30% of the lynx habitat in an LAU is in an early stand initiation structural stage or has been silviculturally treated to remove horizontal cover (i.e., does not provide winter snowshoe hare habitat). Emphasize sustaining snowshoe hare habitat in an LAU. If more than 30% of the lynx habitat in an LAU is in early stand initiation structural stage or has been silviculturally treated to remove horizontal cover (e.g., clearcuts, seed tree harvest, precommercial thinning, or understory removal), no further increase as a result of vegetation management projects should occur on federal lands.
- Recognizing that natural disturbances and forest management of private lands also will occur, management-induced change of lynx habitat on federal lands that creates the early stand initiation structural stage or silviculturally treated to remove horizontal cover should not exceed 15% of lynx habitat on federal lands within a LAU over a 10-year period.
- Conduct a landscape evaluation to identify needs or opportunities for adaptation to climate change. Consider potential changes in forest vegetation that could occur as a result of climate change (e.g., Gärtner et al. 2008). Identify reference conditions relative to the landscape's ecological setting and the range of future climate scenarios. For example, the historical range of variability could be derived from landscape reconstructions (e.g., Hessburg et al. 1999, Blackwell et al. 2003, Gray and Daniels 2006).
- Design harvest units to mimic the pattern and scale of natural disturbances and retain natural connectivity across the landscape.
- In aspen stands, maintain native plant species diversity including conifers.
- Recruit a high density of stems, generally greater than 4,600/ha (1,862/ac), of conifers, hardwoods, and shrubs, including species that are preferred by hares.
- Provide for continuing availability of lynx foraging habitat in proximity to denning habitat.
- When designing fuels reduction projects, where possible retain patches of untreated areas of dense horizontal cover within treated areas.



Ben Maletzke

Plate 5.3. In the western United States, mature multi-story stands provide dense horizontal cover producing stable snowshoe hare densities, especially during winter.

Wildland fire management

Vegetation disturbances have historically and currently been important in maintaining habitat for snowshoe hares and lynx. For several years (10 to 40 depending on site productivity) following stand-replacing disturbances, snowshoe hare and lynx habitat is lost.

Historically, natural processes played a dominant role in maintaining a mosaic of forest successional stages in lynx habitat. Boreal forests historically experienced large (thousands of acres), infrequent (100 to 300 years), stand-replacing fires. Current forest conditions generally fall within the historical range of variation. In areas with a mixed-severity fire regime, moderate- to low-intensity fires also occurred in the intervals between stand-replacing events. Refer to the geographic area descriptions for more detailed information regarding historical fire regimes, the resulting landscape patterns, and the interaction of fire with other agents of natural disturbance.

In drier forests adjacent to boreal forest, fire suppression may have resulted in unnaturally dense fuels. Restoration of these communities may be desirable to reduce the risk of spreading uncharacteristically frequent or severe fires into lynx habitat.

Conservation measures for wildland fire management:

- Maintain fire as an ecological process in lynx habitat, where small populations are not at risk of extirpation due to habitat loss. Evaluate whether fire suppression, forest type conversions, and other management practices have altered fire regimes and the functioning of ecosystems.
- Consider the use of mechanical pre-treatment and management ignitions if needed to restore fire as an ecological process or to maintain specific lynx and/or prey species habitat components.
- As federal fire management plans are developed or revised, integrate lynx habitat management objectives into the plans. Prepare plans for areas that are large enough to encompass large historical fire events. Collaborate across management boundaries to develop approaches that are complementary and that simulate natural disturbance patterns where possible.
- Design burn prescriptions to promote response by shrub and tree species that are favored by snowshoe hare.

Fragmentation of habitat

Within core areas, the amount and arrangement of lynx habitat must be sufficient so that lynx can easily access all parts of their home range and travel between home ranges to find mates. Human-caused alterations of natural landscape patterns that would result in an uncharacteristic reduction of lynx habitat and impaired ability of lynx to effectively utilize those patches of habitat is what is meant by habitat fragmentation. Habitat fragmentation increases the resistance to movement between habitat patches, either within home ranges or during dispersal (Squires et al. 2013).

A mosaic of forest vegetation is desirable. Human developments in lynx habitat, such as highways, utility corridors, residences, and recreation developments, may impede lynx movements but are not likely to be barriers to movement.

It is critical to maintain connectivity of habitat with Canada for those core areas that are adjacent to the international border.

Conservation measures to minimize habitat fragmentation:

- Emphasize land uses that promote or retain conservation of contiguous blocks of lynx habitat.
- Maintain a mosaic of vegetation and features such as riparian areas, forest stringers, unburned inclusions or forested ridges to provide habitat connectivity within and between LAUs.
- Identify linkage areas where needed to maintain connectivity of lynx populations and habitat. Factors such as topographic and vegetation features and local knowledge of lynx movement patterns should be considered. Retain lynx habitat and linkage areas in public ownership and acquire land to secure linkage areas where needed and possible. On private lands in proximity to federal lands, agencies should strive to work with landowners to develop conservation easements, explore potential for land exchanges or acquisitions, or identify other opportunities to maintain or facilitate lynx movement.
- Minimize large-scale developments that would substantially increase habitat fragmentation, reduce snowshoe hare populations, or introduce new sources of mortality.
- Give special attention to the design of highway improvements such as new road alignments, adding traffic lanes, installing Jersey or Texas barriers, or other modifications that increase highway capacity or speed. Upgrading unpaved roads should be avoided in lynx habitat, if the result would be increased traffic speeds and volumes or a substantial increase in associated human activity or development. Crossing structures or other techniques could be used to minimize or offset impacts (Plate 5.4).

First tier of anthropogenic influences in core areas



Plate 5.4. Highway development and upgrades to increase vehicle speeds can be planned to allow for movement of wildlife, including lynx.

Second tier of anthropogenic influences in core areas

Recreation management

There is little empirical information regarding the responses by lynx to recreational activities. Ongoing studies in Colorado are investigating the effects of snowmobiling, backcountry skiing, downhill skiing, and other winter recreation on lynx. Preliminary information suggests that some recreation use may be compatible, but lynx may avoid some areas that have concentrated recreation use (J. Squires personal communication 2012).

Three studies investigated whether compacted snow trails may increase competition for food resources (Bunnell et al. 2006, Kolbe et al. 2007, Burghardt-Dowd 2010). Studies of coyote use of roads having a compacted vs. uncompacted snow surface showed no difference in Montana; however, in Wyoming, coyotes used roads with compacted snow more than random expectation. Whether roads that have a compacted snow surface might facilitate use by coyotes appears to vary depending on snow conditions. The degree of dietary overlap between these 2 species also varies across geographic areas, but appears to be limited within lynx habitat.

Conservation measures for recreation management:

- Manage winter recreation activities within LAUs such that lynx habitat connectivity is maintained or improved where needed.
- To minimize habitat loss, concentrate recreational activities within existing developed and high winter-use areas, rather than developing new sites and facilities in lynx habitat. On federal lands in areas with low levels of recreation currently, consider limiting the future development or expansion of developed winter recreation sites or concentrated winter use areas.
- Direct recreational activities and facilities away from identified linkage areas.
- Consider not expanding designated over-the-snow routes or designated play areas in lynx habitat, unless the designation serves to consolidate use.

Minerals and energy exploration and development

Manage human activities related to mineral and energy exploration and development, including transmission corridors, to minimize the loss and fragmentation of lynx habitat.

Conservation measures for minerals and energy development:

- To minimize loss of lynx habitat resulting from minerals and energy development, locate facilities and roads outside of lynx habitat and linkage areas where possible. Minimize the footprint of developments within lynx habitat.
- Use existing roads and utility corridors to the fullest extent possible for all activities involving exploration and development.
- If upgrading existing access roads, design the roads to the minimum standard needed.
- To the extent possible, restrict public access on roads that were built or used for mineral and energy exploration and development in lynx habitat.
- Encourage remote monitoring to reduce need for and frequency of site visits in lynx habitat.
- Develop reclamation plans for abandoned mine lands to fully rehabilitate and restore as nearly as possible to original contours and native vegetation as habitat for lynx.

Forest/backcountry roads and trails

Forest and backcountry roads and trails are typically low-speed (<72 kph [<45 mph]) single or 2-lane gravel or paved roads that occur on public lands. As described in Chapter 4, lynx in Maine selected against roads and their associated edges within lynx home ranges. In Minnesota, lynx selected for roads during long-distance movements. In Montana, forest roads with low vehicular or snowmobile traffic had little effect on lynx resource selection patterns. McKelvey et al. (2000d) reanalyzed information from the lynx studies in Okanogan County (Koehler and Brittell 1990, Koehler 1990a) and concluded that road density within lynx home ranges did not affect habitat selection.

There have been no documented mortalities of lynx due to vehicular collisions on forest roads in Washington or Montana, but several have been reported in Maine and Minnesota. Forest roads in Maine and Minnesota often have higher traffic volume and speed limits than are typical in the western United States. Site-specific conditions will need to be assessed to determine the potential for impacts.

Conservation measure for forest/backcountry roads and trails:

- Avoid forest/backcountry road reconstruction or upgrades that substantially increase traffic volume and speed. If traffic volume and speed are of concern, incorporate appropriate mitigation such as traffic calming measures in the project design.

Livestock grazing

High-elevation riparian areas dominated by willows provide important summer and fall habitat for lynx (Shenk 2006, 2008). There is potential for overlap with areas that are also utilized by domestic livestock. Manage livestock grazing in a manner that makes competitive interactions unlikely.

Conservation measure for livestock grazing:

- Manage livestock grazing within riparian areas and willow carrs in lynx habitat to maintain conditions that support snowshoe hares by maintaining a preponderance of mid or late-seral stages.

Secondary/peripheral areas: conservation measures

It is not necessary to delineate LAUs in secondary/peripheral areas. The conservation measures are intended to provide a greater degree of flexibility for management activities in secondary/peripheral areas as compared with the core areas. The focus of management is on providing a mosaic of forest structure to support snowshoe hare prey resources for individual lynx that infrequently may move through or reside temporarily in the area. Landscape connectivity should be maintained to allow for lynx movement and dispersal.

Vegetation management

Conservation measures for vegetation management:

- Provide a mosaic of forest structure that includes dense early-successional coniferous and mixed-coniferous-deciduous stands, along with a component of mature multi-story conifer stands. Flexibility in the amounts and arrangement of various successional stages is acceptable, provided that a mosaic can be sustained. Vegetation treatments should be designed with consideration of historical landscape patterns and disturbance processes.
- Design timber harvest, planting, and thinning to include some representation of young densely-stocked regenerating stands in the mosaic for snowshoe hare production areas.

Chapter 6—INVENTORY, MONITORING, AND RESEARCH

Ruggiero et al. (2000a) identified many areas of uncertainty and information gaps relevant to the conservation of lynx. Since 2000, a substantial number of studies on lynx and snowshoe hares and their habitats have been conducted in Maine, Minnesota, Montana, Washington, Wyoming, and Colorado. There are numerous peer-reviewed published papers reporting results from those studies. Nevertheless there are still gaps in our information on lynx, snowshoe hares, and their habitats. The following section identifies the topics to be of the most importance for future inventory, monitoring, and research efforts.

Inventory

The National Lynx Survey was conducted in 1999–2003. The survey protocol sampled lynx habitat using lynx rub pads to collect hair for DNA to be analyzed to confirm species identification (McKelvey et al. 1999, Kendall and McKelvey 2008). Squires et al. (2004) developed a snow tracking protocol for follow-up or additional surveying of areas of potential lynx occupancy. McKelvey et al. (2006) described methods to backtrack putative tracks to collect samples (hair, feces) for DNA analysis and positive species identification. Squires et al. (2012) further refined snow tracking survey methods to determine the presence or absence of lynx in an area of interest. Long et al. (2007) used scat detection dogs to search for rare or low density forest carnivore species and found dogs can be an effective method to locate scats of target species, while ignoring non-target species.

Through the National Lynx Survey, positive identification of lynx occurrence was made in Idaho, Maine, Minnesota, Colorado, Wyoming, Montana, and Washington. Some follow-up snow tracking surveys were also completed to better understand lynx distribution. Following completion of the National Lynx Survey, many additional surveys have been conducted in identified lynx habitat in various locations across the contiguous United States.

Beginning in 2000, lynx habitat was identified using criteria identified in the LCAS. Some of these early efforts misclassified areas, either mapping areas that do not provide habitat for lynx as lynx habitat, or failing to identify areas that actually provide habitat for lynx. Significant efforts have been made throughout the range of lynx in the contiguous United States to field verify and update lynx habitat maps. Validation of lynx habitat within core areas will continue to be a priority to assure that conservation measures are applied effectively.

Surveys for detection of lynx in secondary/peripheral areas are a low priority. Compared to core areas, secondary/peripheral areas are defined as having fewer and more sporadic records of lynx occurrence and the quality and quantity of habitat to support populations of snowshoe hare and lynx is questionable (U.S. Fish and Wildlife Service 2005), making surveys a low priority. The exception would be in secondary/peripheral areas where lynx are reported to be present, such in New Hampshire and Vermont; verifying occurrence and determining the status of lynx in such locations would be a high priority.

Monitoring

The objectives of a long-term monitoring program ideally would include:

1. Detecting changes in lynx population distribution, adult female survival, mortality factors, and population productivity;
2. Snowshoe hare abundance and population trend, including changes in hare abundance in response to different types of vegetation management and landscape patterns in boreal forests; and

3. The effects of climate change on lynx and their habitat, addressing important aspects of lynx habitat such as the depth, density, and duration (annual) of snow cover, and changes in snowshoe hare population density and distribution.

National monitoring design and sampling protocols that are adaptable to regional differences should be established that will enable a cost-effective program to be implemented and coordinated with multiple agencies and partners.

Research needs

Considerable knowledge about lynx has been gained since the original LCAS was completed in 2000. Nevertheless, many unanswered questions remain regarding conservation of lynx and the effects of management actions, thresholds of human activity (including recreation and access) on lynx use of habitat, and effects of climate change on lynx and lynx habitat in the contiguous United States. We have listed what are considered the highest priority topics for research. These are not listed in priority order.

1. The effects of climate change on lynx, lynx habitat, snowshoe hares, and boreal forests in the contiguous United States are unclear. How will the depth, density, and duration (annual) of snow cover vary? Will changes in snow depth and density change influence predator, prey, and competitor relationships for lynx? If climate change results in changes in snow duration, how will pelage changes for snowshoe hare affect their survival? How will climate change affect forest composition, especially the expected decline of spruce and fir in the Northeast? Will fires become more frequent, larger? How will insect outbreaks be altered by climate change and how will this affect fire size and frequency?
2. Current techniques to document presence and distribution of lynx (snow tracking, hair snaring, scat detection dogs) have been developed and tested, but are not proven to estimate population size or trend, or may not work consistently throughout the lynx range.
3. What are the effects of vegetation management activities on lynx population distribution and density? What are the desired amounts and arrangement of habitat within an adult female home range to support reproductive success and recruitment of kittens into the population? How does fragmentation of habitat affect female lynx productivity and home range size? Were key assumptions in the original LCAS (e.g., no more than 30% of a female home range can be in an unsuitable condition) reasonable?
4. What if anything limits the dispersal of lynx? To what extent are lynx moving between Canada and the United States on a yearly basis? What management actions are needed to maintain connectivity across the international border?
5. Expand research to investigate the effects of silvicultural practices on snowshoe hare. Can current partial harvesting practices (such as in Maine) be modified to promote the high stem densities of sapling conifers required to support high snowshoe hare densities?
6. Evaluate the extent to which winter recreational activities and developments, such as skiing and snowmobiling, influence lynx behavior and habitat use. Are there thresholds of human activity in lynx habitat that result in displacement of lynx, loss of prey resources, or increased competition from other carnivores?
7. What role, if any, do secondary and peripheral areas as identified in the recovery outline play in the long-term persistence of lynx and in maintaining occupancy of core areas?

Literature cited

- Abele, S. L. 2004. Premature thinning, where do the hares go? Responses of snowshoe hares to pre-commercial forest thinning. Thesis, University of Idaho, Moscow, USA.
- Adams, A. W. 1963. The lynx explosion. *North Dakota Outdoors* 26:20–24.
- Adams, L. 1959. An analysis of a population of snowshoe hares in northwestern Montana. *Ecological Monographs* 29:141–170.
- Agee, J. K. 1993. Fire ecology of Pacific Northwest forests. Island Press, Washington, D.C.
- Agee, J. K. 2000. Disturbance ecology of North American boreal forests and associated northern mixed/subalpine forests. Pages 39–82 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado. Boulder, Colorado, USA.
- Akcakaya, H. R. 1992. Population cycles of mammals: evidence for a ratio-dependent predation hypothesis. *Ecological Monographs* 62:119–142.
- Alexander, S. M., N. M. Waters, and P. C. Paquet. 2005. Traffic volume and highway permeability for a mammalian community in the Canadian Rocky Mountains. *Canadian Geographer/ Le Géographe Canadien* 49:321–331.
- Alvo, R. 1998. National status evaluation of 20 selected animal species inhabiting Canada's forests. Final Report to the Canadian Pulp and Paper Association, the Biodiversity Convention Office and the Canadian Forest Service. 330 pp.
- Anderson, D. R. and S. Erlinge. 1977. Influence of predation on rodent populations. *Oikos* 29:591–597.
- Apps, C. D. 2000. Space-use, diet, demographics, and topographic associations of lynx in the southern Canadian Rocky Mountains: a study. Pages 351–371 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado. Boulder, Colorado, USA.
- Apps, C. D. 2007. Ecology and conservation of Canada lynx in the southern Canadian Rocky Mountains. Dissertation, University of Calgary, Alberta, Canada.
- Apps, C. D., J. L. Weaver, P. C. Paquet, B. Bateman, and B. N. McLellan. 2007. Carnivores in the southern Canadian Rockies: core areas and connectivity across the Crowsnest Highway. Wildlife Conservation Society Canada Conservation Report No 3. Toronto, Ontario, Canada. <http://www.wcscanada.org/LinkClick.aspx?fileticket=bLGCycLWSCY%3d&tabid=2561> Accessed August 2013.
- Armstrong, D. M. 1972. Distribution of mammals in Colorado. Monograph, University of Kansas Museum of Natural History 3:1–415.
- Armstrong, D. M. 1975. Rocky Mountain mammals. Rocky Mountain Nature Association, Inc. 174 pp.
- Assells, A., H. Boulanger, B. Martin and M. C. Pelletier-Leclerc. 2007. Suivi de l'abondance du lièvre d'Amérique (*Lepus americanus*), de 2000 à 2006 dans sept régions du Québec. Page 38 Ministère des Ressources naturelles et de la Faune. Direction de l'aménagement de la faune, Gaspésie-îles-del-la-Madeleine.
- Association of Fish and Wildlife Agencies. 2011. Best management practices for trapping Canada lynx in the United States. Unpublished Report, Association of Fish and Wildlife Agencies. http://www.fishwildlife.org/files/Lynx_BMP_F.pdf Accessed August 2013.
- Aubry, K. A., G. M. Koehler, and R. H. Naney. 2002. Occurrence of lynx in the North Cascades Highway corridor; final report. Washington Department of Transportation, Olympia, USA.
- Aubry, K. B., G. M. Koehler, and J. R. Squires. 2000. Ecology of Canada lynx in southern boreal forests. Pages 373–396 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado. Boulder, Colorado, USA.
- Ausband, D. E. and G. R. Baty. 2005. Effects of precommercial thinning on snowshoe hare habitat use during winter in low-elevation montane forests. *Canadian Journal of Forest Research* 35:206–210.

- Bailey, R. G. 1995. Descriptions of the ecoregions of the United States. 2nd ed. U.S. Forest Service, Miscellaneous Publication 1391, Washington, D.C., USA.
- Bailey, R. G. 1998. Ecoregion maps of North America: Explanatory note. Miscellaneous Publication 1548. U.S. Forest Service, Washington, D.C., USA.
- Bailey, R. G., P. E. Avers, T. King, and W. H. McNab, editors. 1994. Ecoregions and subregions of the United States. U.S. Forest Service, Washington, D.C., USA.
- Bailey, T. N., E. E. Bangs, M. F. Portner, J. C. Malloy, and R. J. McAvinchey. 1986. An apparent overexploited lynx population on the Kenai Peninsula, Alaska. *Journal of Wildlife Management* 50:279–290.
- Banfield, A. W. F. 1974. The mammals of Canada. University of Toronto Press, Ontario, Canada.
- Barrett, S. W., S. F. Arno, and J. P. Menakis. 1997. Fire episodes in the inland Northwest (1540-1940) based on fire history data. USDA Forest Service, Intermountain Forest and Range Experiment Station, General Technical Report INT-GTR-370. Ogden, Utah. USA.
- Baumgartner, D. M., R. G. Krebill, J. T. Arnott, and G. F. Weetman. 1984. Lodgepole pine: the species and its management. Washington State University, Pullman, WA.
- Bayne, E. M., S. Boutin, and R. A. Moses. 2008. Ecological factors influencing the spatial pattern of Canada lynx relative to its southern range edge in Alberta, Canada. *Canadian Journal of Zoology* 86: 1189–1197.
- Beauvais, G. P. 1997. Mammals in fragmented forests in the Rocky Mountains: community structure, habitat selection, and individual fitness. Dissertation, University of Wyoming, Laramie, USA.
- Bekoff, M. and E. M. Gese. 2003. Coyote. Pages 467–481 in G. A. Feldhamer, B. C. Thompson, and J. A. Chapman, editors. *Wild Mammals of North America: biology, management and conservation*. Johns Hopkins University Press, Baltimore, Maryland, USA.
- Belovsky, G. E. 1984. Snowshoe hare optimal foraging and its implications for population dynamics. *Theoretical Population Biology* 25:235–264.
- Berg, N. D. 2010. Snowshoe hare and forest structure relationships in Western Wyoming. Thesis, Utah State University, Ogden, USA.
- Berg, N. D. and E. M. Gese. 2012. Relationship between fecal pellet counts and snowshoe hare density in western Wyoming. *Journal of Wildlife Management* 74:1745–1751.
- Berg, N. D., E. M. Gese, J. R. Squires, and L. M. Aubry. 2012. Influence of forest structure on abundance of lynx prey species in western Wyoming. *Journal of Wildlife Management* 76(6):1480-1488.
- Bergeron, J. M. and J. Tardif. 1988. Winter browsing preferences of snowshoe hares for coniferous seedlings and its implication in large-scale reforestation programs. *Canadian Journal of Forest Research* 8:280–282
- Berrie, P. M. 1974. Ecology and status of the lynx in interior Alaska. Pages 4-41 in R. L. Eaton, editor. *The world's cats*. Volume I. World Wildlife Safari, Winston, Oregon, USA.
- Beyer, Jr., D. E., B. J. Roell, J. H. Hammill, and R. D. Earle. 2001. Records of Canada Lynx, *Lynx canadensis*, in the upper peninsula of Michigan, 1940-1997. *Canadian Field-Naturalist* 115:234–240.
- Bider, J. R. 1961. An ecological study of the hare *Lepus americanus*. *Canadian Journal of Zoology* 39: 81–103.
- Bider, J. R. 1962. Dynamics and the tempero-spatial relations of a vertebrate community. *Ecology* 43:634–646.
- Bittner, S. L. and O. J. Rongstad. 1982. Snowshoe hare and allies. Pages 146-163 in J.A. Chapman and G. A. Feldhamer, editors. *Wild mammals of North America*. Johns Hopkins University Press, Baltimore, Maryland, USA.
- Björnhag, G. 1994. Adaptations in the large intestine allowing small animals to eat fibrous foods. Pages 287–309 in: D.J. Chivers & P. Langer, editors. *The Digestive System in Mammals*, Cambridge University Press, United Kingdom.
- Black, H. C. 1965. An analysis of a population of snowshoe hares, *Lepus americanus washingtonii* Baird, in western Oregon. Ph.D. Dissertation, Oregon State University, Corvallis, USA.
- Blackwell, B. A., R. W. Gray, R. N. Green, F. Feigl, T. Berry, D. Ohlson and B. Hawkes. 2003. Developing a coarse scale approach to the assessment of forest fuel conditions in southern British Columbia. Forest Innovation Investment. Victoria, British Columbia, Canada.
- Blais, J. R. 1983. Trends in the frequency, extent, and severity of spruce budworm outbreaks in eastern Canada. Cana-

- dian Journal of Forest Research 13(4):539-547.
- Bookhout, T. A. 1965. The snowshoe hare in upper Michigan: its biology and feeding coactions with white-tailed deer. Michigan Department of Conservation, Research and Development Report 38.
- Boonstra, R., S. Boutin, A. Byrom, T. Karels, A. Hubbs, K. Stuart-Smith, M. Blower, and S. Antpoehler. 2001. The role of red squirrels and arctic ground squirrels. Pages 179–214 in C.J. Krebs, S. Boutin, and R. Boonstra, editors. *Ecosystem Dynamics of the Boreal Forest: The Kluane Project*, Oxford University Press, New York, New York, USA.
- Boonstra, R., D. Hik, G. R. Singleton, and A. Tinnikov. 1998. The impact of predator-induced stress on the snowshoe hare cycle. *Ecological Monographs* 79:371–394.
- Boonstra, R. and G. Singleton. 1993. Population declines in the snowshoe hare and the role of stress. *General and Comparative Endocrinology* 91:126–143.
- Borrecco, J. E. 1976. Controlling damage by forest rodents and lagomorphs through habitat manipulation. In *Proceedings: Seventh Vertebrate Pest Conference*, C. S. Siebe, editor. March 9–11, 1976, Monterey, California, USA.
- Boutin, S., C. J. Krebs, R. Boonstra, A. R. E. Sinclair, and J. N. M. Smith. 1986. Proximate causes of losses in a snowshoe hare population. *Canadian Journal of Zoology* 64:606–610.
- Boutros, D., C. Breitenmoser-Würsten, F. Zimmermann, A. Ryser, A. Molinari-Jobin, S. Capt, M. Güntert, and U. Breitenmoser. 2007. Characterization of Eurasian lynx *Lynx lynx* den sites and kitten survival. *Wildlife Biology* 13:417–429.
- Brainerd, S. M. 1985. Reproductive ecology of bobcats and lynx in western Montana. Thesis, University of Montana, Missoula, USA.
- Brand, C. J. and L. B. Keith. 1979. Lynx demography during a snowshoe hare decline in Alberta. *Journal of Wildlife Management* 43:827–849.
- Brand, C. J., L. B. Keith, and C. A. Fischer. 1976. Lynx responses to changing snowshoe hare densities in Alberta. *Journal of Wildlife Management* 40:416–428.
- Brand, C. J., R. H. Vowles, and L.B. Keith. 1975. Snowshoe hare mortality monitored by telemetry. *Journal of Wildlife Management* 39:741–747.
- British Columbia Wildlife Accident Reporting System. 2012. B.C. Ministry of Transportation and Infrastructure, Victoria, B.C. Accessed Jan 3, 2012.
- Brittell, J. D., Poelker, R. J., S. J. Sweeney, and G. M. Koehler. 1989. Native cats of Washington. Washington Department of Wildlife, Olympia, USA.
- Brocke, R, K. A. Gustafson, and A. R. Major. 1990. Restoration of the lynx in New York: biopolitical lessons. *Transactions North American Wildlife and Natural Resources Conference* 55:590-598.
- Brooks, M. 1955. An isolated population of the Virginia varying hare. *Journal of Wildlife Management* 19:54–61.
- Brown, D. F. 1984. Snowshoe hare populations, habitat, and management in northern hardwood forest regeneration areas. Thesis, Pennsylvania State University, Collegeville, USA.
- Brown, M. D. and G. Will. 1979. Food habits of the fisher in northern N. Y. *New York Fish and Game Journal* 26:87–92.
- Bryant, J. P. 1981. The regulation of snowshoe hare feeding behaviour during winter by plant antiherbivore chemistry. Pages 720–731 in *Proceedings of the World Lagomorph Conference*. K. Myers and C. D. MacInnes, editors. University of Guelph, Ontario, Canada.
- Buehler, D. A. and L. B. Keith. 1982. Snowshoe hare distribution and habitat use in Wisconsin. *Canadian Field-Naturalist* 96:19–29.
- Bull, E. L., T. W. Heater, A. A. Clark, J. F. Shepherd, and A. K. Blumton. 2005. Influence of precommercial thinning on snowshoe hares. USDA Forest Service, Pacific Northwest Research Station, PNW-RP-562, Portland, Oregon, USA.
- Bunnell, K. D., J. T. Flinders, and M. L. Wolfe. 2006. Potential impacts of coyotes and snowmobiles on lynx conservation in the Intermountain West. *Wildlife Society Bulletin* 34:828–838.

- Burdett, C. L. 2008. Hierarchical structure of Canada lynx space use and habitat selection in northeastern Minnesota. Dissertation, University of Minnesota. Duluth, USA.
- Burdett, C. L., R. A. Moen, G. J. Niemi, and L. D. Mech. 2007. Defining space use and movements of Canada lynx with Global Positioning System telemetry. *Journal of Mammalogy* 88: 457–467.
- Burghardt-Dowd, J. L. 2010. Coyote diet and movements in relation to winter recreation in northwestern Wyoming: Implications for lynx conservation. Thesis, Utah State University, Logan, UT, USA.
- Buskirk, S. W., L. F. Ruggiero, and C. J. Krebs. 2000a. Habitat fragmentation and interspecific competition: implications for lynx conservation. Pages 83–100 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado. Boulder, Colorado, USA.
- Buskirk, S. W., L. F. Ruggiero, K. B. Aubry, D. E. Pearson, J. R. Squires, and K. S. McKelvey. 2000b. Comparative ecology of lynx in North America. Pages 397–417 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado. Boulder, Colorado, USA.
- Campbell, V. and C. Strobeck. 2006. Fine-scale genetic structure and dispersal in Canada lynx (*Lynx canadensis*) with Alberta, Canada. *Canadian Journal of Zoology* 84:1112–1119.
- Carbyn, L. N. and D. Patriquin. 1983. Observations on home range sizes, movement, and social organization of lynx, *Lynx canadensis* in Riding Mountain National Park, Manitoba. *Canadian Field-Naturalist* 97:262–267.
- Carroll, A. L., S. W. Taylor, J. Régnière, and L. Safranyik. 2003. Effects of climate change on range expansion by the mountain pine beetle in British Columbia. Pages 223–232 in T. L. Shore, J. E. Brooks, and J. E. Stone, editors. *Mountain pine beetle symposium: challenges and solutions*. Natural Resources Canada, Canadian Forest Service, Pacific Forestry Centre Information Report BC-X-399, Victoria, British Columbia, Canada.
- Carroll, C. 2007. Interacting effects of climate change, landscape conversion, and harvest on carnivore populations at the range margin: marten and lynx in the northern Appalachians. *Conservation Biology* 21(4):1092–1104.
- Cary, J. R. and L. B. Keith. 1979. Reproductive change in the 10-year cycle of snowshoe hares. *Canadian Journal of Zoology* 57:375–390.
- Catton, T. J. and S. Loch. 2010. Summary of the Superior National Forest's 2010 Canada lynx (*Lynx canadensis*) DNA database. USDA Forest Service, unpublished report, Nov. 5, 2010. Duluth, Minnesota. 2 pp.
- Clarke, C. H. D. 1939. Some notes on hoarding and territorial behavior of the red squirrel *Sciurus hudsonicus* (Erxleben). *Canadian Field-Naturalist* 53:42–43.
- Cohen, S. and K. Miller (editors). 2001. North America. in *Climate change 2001: Impacts, adaptation, and vulnerability*. J. McCarthy, O. Canziani, N. Leary, D. Dokken, and K. White editors. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, United Kingdom. http://www.grida.no/climate/ipcc_tar/wg2/pdf/wg2TARchap15.pdf Accessed August 2013.
- Conroy, M. J., L. W. Gysel, and G. R. Dudderar. 1979. Habitat components of clear-cut areas for snowshoe hares in Michigan. *Journal of Wildlife Management* 43:680–690.
- Cook, D. B. and S. B. Robeson. 1945. Varying hare and forest succession. *Ecology* 26:406–410.
- Cordell, H. K., G. T. Green, and C. J. Betz. 2009. Long-term national trends in outdoor recreation activity participation ---1980 to now. A recreation research report in the Internet Research Information Series. <http://warnell.forestry.uga.edu/nrrt/nsre/IRISRec/IRISRec12rpt.pdf> Accessed August 2013.
- Cox, E. W., R. A. Garrott, and J. R. Cary. 1997. Effect of supplemental cover on survival of snowshoe hares and cottontail rabbits in patchy habitat. *Canadian Journal of Zoology* 75:1357–1363.
- Crete, M. and S. Larivière. 2003. Estimating the costs of locomotion in snow for coyotes. *Canadian Journal of Zoology* 81:1808–1814.
- Daniel, T. W., J. A. Helms, and F. S. Baker. 1979. *Principles of silviculture*. 2nd edition. McGraw-Hill Book Company, New York City, New York, USA.
- Daubenmire, R. and J. B. Daubenmire. 1968. *Forest vegetation of eastern Washington and northern Idaho*. Washington

- Agricultural Experiment Station, Technical Bulletin 60, Pullman, Washington, USA.
- de Bellefeuille, S., L. Belanger, J. Huot, and A. Cimon. 2001. Clear-cutting and regeneration practices in Quebec boreal balsam fir forest: effects on snowshoe hare. *Canadian Journal of Forest Research* 31:41–51.
- Demarchi, D. A. 1994. Ecoprovinces of the central North American Cordillera and adjacent plains. Pages 153–168 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, and W. J. Zielinski, editors. *The scientific basis for conserving forest carnivores: American marten, fisher, lynx and wolverine in the western United States*. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station. General Technical Report RM-254. Fort Collins, Colorado, USA.
- Devineau, O., T. M. Shenk, G. C. White, P. F. Doherty, Jr., P. M. Lukacs, and R. H. Kahn. 2010. Evaluating the Canada Lynx reintroduction programme in Colorado: patterns in mortality. *Journal of Applied Ecology* 47:524–531.
- de Vos, A. 1964. Food utilization of snowshoe hares on Manitoulin Island, Ontario. *Journal of Forestry* 62:238–244.
- Diaz, H. F. and C. I. Millar. 2004. Discussing the future of U.S. western mountains, climate change, and ecosystems, *EOS Transactions of American Geophysical Union* 85(35):329.
- Dodds, D. G. 1960. Food competition and range relationships of moose and snowshoe hare in Newfoundland. *Journal of Wildlife Management* 24(1):52–60.
- Dolbeer, R. A. and W. C. Clark. 1975. Population ecology of snowshoe hares in the central Colorado Rocky Mountains. *Journal of Wildlife Management* 39:535–549.
- Dowd, J. L. B. and E. M. Gese. 2012. Seasonal variation of coyote diet in northwestern Wyoming: implications for dietary overlap with Canada lynx? *Northwest Science* 86:289–299.
- Dufty, A. M., Jr., and J. R. Belthoff. 2001. Proximate mechanisms of natal dispersal: the role of body condition and hormones. Pages 217–229 in J. Clobert, E. Danchin, A.A. Dhondt, and J.D. Nichols, editors. *Dispersal*. Oxford University Press, Oxford, United Kingdom.
- Earhart, C. M. and N. K. Johnson. 1970. Size dimorphism and food habits of North American owls. *Condor* 72:251–264.
- Ehle, D. S. and D. A. Keinath. 2002. Habitat mapping of lynx analysis units on Bureau of Land Management lands and surrounding areas in Wyoming. Wyoming Natural Diversity Database, University of Wyoming. Laramie, USA.
- Eisenberg, J. F. 1986. Life history strategy of the Felidae: variations on a common theme. Pages 293–303 In S. D. Miller and D. D. Everett. *Cats of the world: biology, conservation, and management*. National Wildlife Federation, Washington, D.C., USA.
- Ellsworth, E. 2004. Are conifers poor winter foods for snowshoe hares in the Rocky Mountains? Digestibility trials and a food supplementation experiment. Pages 42–46 in C.L.K. Baer, editor. *Proceedings of the Comparative Nutrition Society*, Number 5, Silver Spring, Maryland, USA.
- Ellsworth, E. 2009. Surviving the winter: the importance of snowshoe hare foraging behavior. BEHAVE (Behavioral Education for Human, Animal, Vegetation and Ecosystem Management) Publication. University of Idaho, Moscow, and Washington State University, Pullman, USA.
- Ellsworth, E., and T. D. Reynolds. 2006. Snowshoe hare (*Lepus americanus*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region, Species Conservation Project. <http://www.fs.fed.us/r2/projects/scp/assessments/snowshoehare.pdf> Accessed August 2013.
- Elton, C. and M. Nicholson. 1942. The ten-year cycle in numbers of the lynx in Canada. *Journal of Animal Ecology* 11:215–244.
- Erb, J. 2012. Registered furbearer harvest statistics, 2011-12 Report. Minnesota Dept. of Natural Resources, Grand Rapids, Minnesota. 30 pp. http://files.dnr.state.mn.us/recreation/hunting/trapping/harvest_11-12.pdf Accessed August 2013.
- Fancy, S. G. 1980. Nest-tree selection by red squirrels in a boreal forest. *Canadian Field-Naturalist* 94:198.
- Ferron, J., F. Potvin, and C. Dussault. 1998. Short-term effects of logging on snowshoe hares in the boreal forest. *Canadian Journal of Forest Research* 28(9):1335–1343.
- Fischer, W. C. and A. F. Bradley. 1987. Fire ecology of western Montana forest habitat types. USDA Forest Service,

- Intermountain Forest and Range Experiment Station, General Technical Report INT-223. Ogden, Utah, USA.
- Fitzgerald, J. P., C. A. Meany, and D. M. Armstrong. 1994. Mammals of Colorado. Denver Museum of Natural History, Colorado. USA.
- Foresman, K. R. and D. E. Pearson. 1999. Activity patterns of American martens, *Martes americana*, snowshoe hares, *Lepus americanus*, and red squirrels, *Tamiasciurus hudsonicus*, in westcentral Montana. *Canadian Field-Naturalist* 113:386–389.
- Forman, R. T. T. and L. E. Alexander. 1998. Roads and their major ecological effects. *Annual Review of Ecology and Systematics* 29:207–231.
- Fox, J. F. 1978. Forest fires and the snowshoe hare-Canada lynx cycle. *Oecologia* 31:349–374.
- Fox, J. F. and J. P. Bryant. 1984. Instability of the snowshoe hare and woody plant interaction. *Oecologia* 63:128–135.
- Franklin, J. F. and C. T. Dyrness. 1973. Natural vegetation of Oregon and Washington. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, GTR-PNW-8, Portland, Oregon, USA.
- Frey, J. F. 2004. Taxonomy and distribution of the mammals of New Mexico: an annotated checklist. Museum of Texas Tech University, Occasional Papers 240:1–32.
- Frey, J. F. 2006. Inferring species distributions in the absence of occurrence records: An example considering wolverine (*Gulo gulo*) and Canada lynx (*Lynx canadensis*) in New Mexico. *Biological Conservation* 130:16–24.
- Fuller, A. K. 1999. Influence of partial timber harvesting on American marten and their primary prey in northcentral Maine. Thesis, University of Maine, Orono, Maine, USA.
- Fuller, A. K. 2004. Canada lynx predation on white-tailed deer. *Northeastern Naturalist* 11(4):395–398.
- Fuller, A. K. 2006. Multi-scalar responses of forest carnivores to habitat and spatial pattern: case study with Canada lynx and American marten. Doctoral dissertation, University of Maine, Orono, Maine, USA.
- Fuller, A. K. and D. J. Harrison. 2005. Influence of partial timber harvesting on American martens in North-central Maine. *Journal of Wildlife Management* 69:710–722.
- Fuller, A. K. and D. J. Harrison. 2010. Movement paths reveal scale-dependent habitat decisions by Canada lynx. *Journal of Mammalogy* 91:1269–1279.
- Fuller, A. K., D. J. Harrison, and J. H. Vashon. 2007. Winter habitat selection by Canada lynx in Maine: Prey abundance or accessibility? *Journal of Wildlife Management* 71:1980–1986.
- Fuller, T. K. and D. M. Heisey. 1986. Density-related changes in winter distribution of snowshoe hares in north central Minnesota. *Journal of Wildlife Management* 50:261–264.
- Galatowitsch, S. L. Frelich and L. Phillips-Mao. 2009. Regional climate change adaptation strategies for biodiversity conservation in a midcontinental region of North America. *Biological Conservation* 142 (2009) 2012–2022.
- Gärtner, S., K. M. Reynolds, P. F. Hessburg, S. Hummel, M. Twery. 2008. Decision support for evaluating landscape departure and prioritizing forest management activities in a changing environment. *Forest Ecology and Management* 256: 1666–1676.
- Gayton, D. 2008. Impacts of climate change on British Columbia's biodiversity: A literature review. Forrex Series 23. Forrex Forest Research Extension Partnership, Kamloops, British Columbia, Canada.
- Gibeau, M. and K. Heuer. 1996. Effects of transportation corridors on large carnivores in the Bow River Valley, Alberta. Pages 67-79 in Proceedings Florida Department of Transportation/Federal Highway Administration Transportation-Related Wildlife Mortality Seminar, April 30–May 2, 1996, Orlando, Florida, USA.
- Gilbert, B. A. and W. Pierce. 2005. Predicting the availability of understory structural features important for Canadian lynx denning habitat on managed lands in northeastern Washington lynx ranges. *Western Journal of Applied Forestry* 20(4):224–227.
- Gilbert, B. S. and S. Boutin. 1991. Effect of moonlight on winter activity of snowshoe hares. *Arctic and Alpine Research* 23:61–65.
- Gillis, E. A. 1998. Survival of juvenile snowshoe hares during a cyclic population increase. *Canadian Journal of Zoology* 76:1949–1956.
- Gillis, E. A. and C. J. Krebs. 1999. Natal dispersal of snowshoe hares during a cyclic population increase. *Journal of*

Mammalogy 80:933–939.

- Gitay, H., A. Suárez, R. T. Watson, and D. J. Dokken, editors. 2002. Climate change and biodiversity. Intergovernmental Panel on Climate Change, Technical Paper V. Geneva, Switzerland. 85 pp.
- Godbout, G. 1999. Determination de la presence d'un cycle de population du lièvre d'Amérique (*Lepus americanus*) au Québec et des méthodes de suivi applicables à cette espèce. Faune et Parc Québec, Québec, Canada.
- Godin, A. J. 1977. Wild mammals of New England. Johns Hopkins Univ. Press Baltimore, MD. 304 pp.
- Gonzalez, P., R. P. Neilson, K. S. McKelvey, J. M. Lenihan, and R. J. Drapek. 2007. Potential impacts of climate change on habitat and conservation priority areas for *Lynx canadensis* (Canada Lynx). The Nature Conservancy, Arlington, Virginia, USA.
- Gordon, K. 1936. Territorial behavior and social dominance among Sciuridae. Journal of Mammalogy 17:171–172.
- Grange, W. B. 1932. Observations on the snowshoe hare, *Lepus americanus phaeonotus* Allen. Journal of Mammalogy 13:1–19.
- Gray, R. W. and L. D. Daniels. 2006. Range of natural variation of old growth forests in the sea-to-sky land and resource management area: status of knowledge and understanding. Final Report to British Columbia Ministry of Forests, Victoria, Canada.
- Green, R. G. and C. A. Evans. 1940. Studies on a population cycle of snowshoe hares on the Lake Alexander Area: I. Gross Annual Censuses, 1932–1939. Journal of Wildlife Management 4:220–238.
- Griffin, P. C. 2004. Landscape ecology of snowshoe hares in Montana. Dissertation, University of Montana, Missoula, Montana, USA.
- Griffin, P. C., S. C. Griffin, C. Waroquiers, and L. S. Mills. 2005. Mortality by moonlight: predation risk and the snowshoe hare. Behavioral Ecology 16:938–944.
- Griffin, P. C. and L. S. Mills. 2004. Snowshoe hares (*Lepus americanus*) in the western United States: movement in a dynamic landscape. Pages 438–449 in H.R. Akcakaya, M.A. Burgman, O. Kindvall, C.C. Wood, P. Sjogren-Gulve, J.S. Hatfield, and M.A. McCarthy, editors. Species conservation and management: Case studies. Oxford University Press, New York, New York, USA.
- Griffin, P. C., and L. S. Mills. 2007. Precommercial thinning reduces snowshoe hare abundance in the short term. Journal of Wildlife Management 71:559–564.
- Grigal, D. F. and N. R. Moody. 1980. Estimation of browse by size classes for snowshoe hares. Journal of Wildlife Management 4:267–278.
- Gruell, G. 1983. Fire and vegetation trends in the Northern Rockies: interpretations from 1871–1982 photographs. USDA Forest Service, Intermountain Forest and Range Experiment Station INT-158, Ogden, Utah, USA.
- Gunderson, H. L. 1978. A midcontinent irruption of Canada lynx, 1962–63. Prairie Naturalist, Brookings, South Dakota, USA 10:71–80.
- Gurnell, J. 1984. Home range, territoriality, caching behaviour and food supply of the red squirrel (*Tamiasciurus hudsonicus fremonti*) in a subalpine lodgepole pine forest. Animal Behavior 32:1119–1131.
- Habeck, J. R. 1985. Impact of fire suppression on forest succession and fuel accumulations in long-fire-interval wilderness habitat types. Pages 110–118 in J. E. Lotan, B. M. Kilgore, W. C. Fischer, and R. M. Mutch, editors. Proceedings Symposium and Workshop on Wilderness Fire, November 15–18, 1983, Missoula, Montana. USDA Forest Service, Intermountain Forest and Range Experiment Station, General Technical Report INT-GTR-182. Ogden, Utah, USA.
- Halfpenny, J. C., S. J. Bissell, and D. Nead. 1979. Status of the lynx (*Felis lynx*, Felidae) in Colorado with comments on its distribution in western United States. <http://www.halfpenny.me/PDFby/Lynx%20CO%20Halfpenny.pdf> Accessed August 2013.
- Hall, E. Raymond. 1981. The mammals of North America. 2 volumes. Ronald Press, New York, New York, USA.
- Hall, E. R. and K. R. Kelson. 1959. The mammals of North America, 2 vols. Ronald Press, New York, New York, USA.
- Halpin, M. A. and J. A. Bissonette. 1988. Influence of snow depth on prey availability and habitat use by red fox. Canadian Journal of Zoology 66:587–592.

- Hamilton, W. J., Jr. 1939. Observations on the life history of the red squirrel in New York. *American Midland Naturalist* 22:732–745.
- Hamilton, W. J., Jr. and A. H. Cook. 1955. The biology and management of the fisher in New York. *New York Fish and Game Journal* 2:13–35.
- Hann, W. J., J. L. Jones, M. G. Karl, P. F. Hessburg, R. E. Keane, D. G. Long, J. P. Menakis, C. H. McNicoll, J. P. Menakis, and C. H. McNicoll. 1997. Landscape dynamics of the basin in T. M. Quigley and S. J. Arbelvide, editors. An assessment of the ecosystem components in the Interior Columbia Basin and portions of the Klamath and Great Basins, Volume II. USDA Forest Service, Pacific Northwest Research Station. General Technical Report PNW-GTR-405. Portland, Oregon, USA.
- Hannah, L., and T. E. Lovejoy. 2003. Climate change and biodiversity: synergistic impacts. *Advances in Applied Biodiversity Science* 4:1-123.
- Hanski, I., H. Henttonen, E. Korpimäki, L. Oksanen, and P. Turchin. 2001. Small-rodent dynamics and predation. *Ecology* 82:1505–1510.
- Hanson, K. and R. Moen. 2008. Diet of Canada lynx in Minnesota estimated from scat analysis. Natural Resource Research Institute, NRR I TR-2008/13. University of Minnesota, Duluth, Minnesota, USA.
- Hardy, C. C., J. P. Menakis, J. K. Brown, and D. L. Bunnell. 1998. Mapping historic fire regimes for the Western United States: Integrating remote sensing and biophysical data. Pages 288–300 in J. D. Greer, editor. *Natural resource management using remote sensing and GIS, Proceedings of the Seventh Forest Service Remote Sensing Applications Conference; 1998 April 6-10; Nassau Bay, Texas.* American Society for Photogrammetry and Remote Sensing, Bethesda, Maryland, USA.
- Harger, E. M. 1965. The status of the Canada lynx in Michigan. *The Jack-Pine Warbler* 43:150–153.
- Harper, S. C., L. L. Falk, and E. W. Rankin. 1990. *The northern forest lands study of New England and New York.* USDA Forest Service. Rutland, Vermont, USA.
- Harris, J. A., R. J. Hobbs, E. Higgs, and J. Aronson. 2006. Ecological restoration and global climate change. *Restoration Ecology* 14:170–176.
- Hatt, R. T. 1929. The red squirrel: its life history and habits, with special reference to the Adirondacks of New York and the Harvard Forest. *Roosevelt Wild Life Annal* 2:3–146.
- Hatt, R. T. 1945. The pine squirrel in Colorado. *Journal of Mammalogy* 24:311–345.
- Hayhoe, K., C. P. Wake, T. G. Huntington, L. Luo, M. Schwartz, J. Sheffield, E. Wood, B. Anderson, J. Bradbury, A. DeGaetano, T. Troy, and D. Wolfe. 2007. Past and future changes in climate and hydrological indicators in the U. S. Northeast. *Climate Dynamics* 28:381-407.
- Heinselman, M. L. 1996. *The boundary waters wilderness ecosystem.* University of Minnesota Press. Minneapolis, Minnesota, USA.
- Henderson, C. 1978. Minnesota Canada Lynx report, 1977. *Minnesota Wildlife Research Quarterly* 38:221-242.
- Hessburg, P. F., J. K. Agee, and J. F. Franklin. 2005. Dry forests and wildland fires of the inland Northwest USA: Contrasting the landscape ecology of the pre-settlement and modern eras. *Forest Ecology and Management*. 211:117–139.
- Hessburg, P. F., B. G. Smith, S. D. Kreiter, C. A. Miller, B. R. Salter, C. H. McNicoll, and W. J. Hann. 1999. Historical and current forest and range landscapes in the interior Columbia River basin and portions of the Klamath and Great Basins. Part I: Linking vegetation patterns and landscape vulnerability to potential insect and pathogen disturbances. USDA Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-458. Portland, Oregon, USA.
- Hik, D. S. 1994. Predation risk and the snowshoe hare cycle. Dissertation, University of British Columbia, Vancouver. British Columbia, Canada.
- Hik, D. S. 1995. Does risk of predation influence population dynamics? Evidence from cyclic decline of snowshoe hares. *Wildlife Research* 22:115–129.
- Hodges, K. E. 1998. Snowshoe hare demography and behavior during a cyclic population low phase. Dissertation, Uni-

- versity of British Columbia, Vancouver, British Columbia, Canada.
- Hodges, K. E. 2000a. The ecology of snowshoe hares in northern boreal forests. Pages 117–161 In L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, editors. Ecology and conservation of lynx in the United States. University Press of Colorado. Boulder, Colorado, USA.
- Hodges, K. E. 2000b. Ecology of snowshoe hares in southern boreal and montane forests. Pages 163–206 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, editors. Ecology and conservation of lynx in the United States. University Press of Colorado. Boulder, Colorado, USA.
- Hodges, K. E., C. J. Krebs, D. S. Hik, C. I. Stefan, E. A. Gillis, and C. E. Doyle. 2001. Snowshoe hare demography. Pages 141–178 in Krebs C. J., S. Boutin, and R. Boonstra (editors). Ecosystem Dynamics of the Boreal Forest: the Kluane Project. Oxford University Press, New York, USA.
- Hodges, K. E. and L. S. Mills. 2008. Designing fecal pellet surveys for snowshoe hares. *Forest Ecology and Management* 256:1918–1926.
- Hodges, K. E., L. S. Mills, and K. M. Murphy. 2009. Distribution and abundance of snowshoe hares in Yellowstone National Park. *Journal of Mammalogy* 90:870–878.
- Hodges, K. E. and A.R.E. Sinclair. 2003. Does predation risk cause snowshoe hares to modify their diets? *Canadian Journal of Zoology* 81:1973–1985.
- Hodges, K. E. and A. R. E. Sinclair. 2005. Browse site selection by snowshoe hares: effects of food supply and predation risk. *Canadian Journal of Zoology*. 83:280–292.
- Hoffman, J. D. and H. H. Genoways. 2005. Recent records of formerly extirpated carnivores in Nebraska. *Prairie Naturalist*, Brookings, South Dakota, USA, 37:225–244.
- Hoffman, R. S. and A. T. Smith. 2005. Order Lagomorpha. Pages 185–211 in D. E. Wilson and D. M. Reeder, editors. *Mammal Species of the World a Taxonomic and Geographic Reference*. Johns Hopkins University Press, Baltimore, Maryland, USA.
- Holter, J. B., G. Tyler, and T. Walski. 1974. Nutrition of the snowshoe hare (*Lepus americanus*). *Canadian Journal of Zoology* 52:1553–1558.
- Homyack, J. A. 2003. Effects of precommercial thinning on snowshoe hares, small mammals, and forest structure in northern Maine. Thesis, University of Maine, Orono, Maine, USA.
- Homyack, J. A., D. J. Harrison, and W. B. Krohn. 2004. Structural differences between precommercially thinned and unthinned conifer stands. *Forest Ecology and Management*. 194:131–143.
- Homyack, J. A., D. J. Harrison, and W. B. Krohn. 2005. Long-term effects of precommercial thinning on small mammals in northern Maine. *Forest Ecology and Management* 205:43–57
- Homyack, J. A., D. J. Harrison, and W. B. Krohn. 2007. Effects of precommercial thinning on snowshoe hares in Maine. *Journal of Wildlife Management* 71:4–13.
- Homyack, J. A., D. J. Harrison, J. A. Litvaitis, and W. B. Krohn. 2006. Quantifying densities of snowshoe hares in Maine using pellet plots. *Wildlife Society Bulletin* 34:74–80.
- Homyack, J. A., J. H. Vashon, C. Libby, E. L. Lindquist, S. Loch, D. F. McAlpine, K. L. Pilgrim, and M. K. Schwartz. 2008. Canada lynx-bobcat (*Lynx canadensis* × *L. rufus*) hybrids at the southern periphery of lynx range in Maine, Minnesota and New Brunswick. *The American Midland Naturalist* 159:504–508.
- Honacki, J. H., K. E. Kinman, and J. W. Koeppi, editors. 1982. *Mammal species of the world: a taxonomic and geographic reference*. Allen Press, Incorporated and Association of Systematics Collections, Lawrence, Kansas, USA.
- Houben, J. M., M. Holland, S. W. Jack, and C. R. Boyle. 1993. An evaluation of laminated offset jawed traps for reducing injuries to coyotes. *Proceedings of Great Plains Wildlife Damage Control Workshop*, University of Nebraska, Lincoln, Nebraska.
- Houston, A. I., J. M. McNamara, J. M. C. Hutchinson 1993. General results concerning the trade-off between gaining energy and avoiding predation. *Philosophical Transactions of Royal Society Biological Sciences*, London, United Kingdom 341:375–397.
- Hoving, C. L. 2001. Historical occurrence and habitat ecology of Canada lynx (*Lynx canadensis*) in eastern North Ameri-

- ca. Thesis, University of Maine. Orono, USA.
- Hoving, C. L., R. A. Joseph, and W. B. Krohn. 2003. Recent and historical distributions of Canada lynx in Maine and the Northeast. *Northeastern Naturalist* 10(4):363-382.
- Hoving, C. L., D. J. Harrison, W. B. Krohn, W. J. Jakubas, and M. A. McCollough. 2004. Canada lynx (*Lynx canadensis*) habitat and forest succession in northern Maine, USA. *Wildlife Biology* 10: 285–294.
- Hoving, C. L., D. J. Harrison, W. B. Krohn, R. A. Joseph, and M. O'Brien. 2005. Broad-scale predictors of Canada lynx occurrence in eastern North America. *Journal of Wildlife Management* 69:739–751.
- Ims, R. A., J. Henden, and S. T. Killengree. 2008. Collapsing population cycles. *Trends in Ecology and Evolution* 23:79-86.
- Inkley, D. B., M. G. Anderson, A. R. Blaustein, V. R. Burkett, B. Felzer, B. Griffith, J. Price, and T. L. Root. 2004. Global climate change and wildlife in North America. *Wildlife Society Technical Review* 04-2. The Wildlife Society, Bethesda, Maryland, USA.
- Ivan, J. S. 2011a. Density, demography, and seasonal movements of snowshoe hares in central Colorado. Dissertation, Colorado State University, Fort Collins, Colorado, USA.
- Ivan, J. S. 2011b. Putative Canada lynx (*Lynx canadensis*) movements across Hwy 50 near Monarch Ski Area, Colorado. Unpublished report, Colorado Parks and Wildlife. <http://wildlife.state.co.us/SiteCollectionDocuments/DOW/Research/Mammals/Publications/LynxMovementsNearMonarchSkiArea.pdf> Accessed August 2013.
- Ivan, J. S. 2011c. Putative Canada lynx (*Lynx canadensis*) movements across Hwy 114 near North Pass, Colorado. Unpublished report, Colorado Parks and Wildlife. <http://wildlife.state.co.us/SiteCollectionDocuments/DOW/Research/Mammals/Publications/LynxMovementsNearNorthPassColorado.pdf> Accessed August 2013.
- Ivan, J. S. 2012. Putative Canada lynx (*Lynx canadensis*) movements across Hwy 40 near Berthoud Pass, Colorado. Unpublished report, Colorado Parks and Wildlife. <http://wildlife.state.co.us/SiteCollectionDocuments/DOW/Research/Mammals/Publications/LynxMovementsnearBerthoudPassColorado.pdf> Accessed August 2013.
- Ivan, J., M. Rice, T. Shenk, D. Theobald and E. Odell. 2012. Predictive map of Canada lynx habitat use in Colorado. Unpublished Report. Colorado Parks and Wildlife. <http://wildlife.state.co.us/SiteCollectionDocuments/DOW/Research/Mammals/Publications/CPWPredictiveLynxMapReport.pdf> Accessed August 2013.
- Iverson, L., A. Prasad, and S. Matthews. 2008. Modeling potential climate change impacts on the trees of the northeastern United States. *Mitigation and Adaptations Strategies for Global Change* 13:487-516.
- Ives, W. G. H. and C. L. Rentz. 1993. Factors affecting the survival of immature lodgepole pine in the foothills of west-central Alberta. Forestry Canada, Northwest Region, Northern Forestry Centre, Information Report NOR-X330, Edmonton, Alberta, Canada.
- Jacobson, G. L., I. J. Fernandez, P. A. Mayewski, and C. V. Schmitt, editors. 2009. Maine's climate future: an initial assessment. University of Maine, Orono, Maine, USA.
- Johnson, C. G. and S. A. Simon. 1987. Plant associations of the Wallowa-Snake Province, Wallowa-Whitman National Forest. USDA Forest Service, R6-ECOL-TP-255B-86, Portland, Oregon, USA.
- Johnson, W. J. 1969. Food habits of the Isle Royale red fox and populations aspects of three of its principal prey species. Dissertation, Purdue, West Lafayette, Indiana, USA.
- Johnstone, W. D. 1981. Effects of spacing 7-year-old lodgepole pine in west-central Alberta. Forestry Canada, Northwest Region, Northern Forestry Centre, Nor-X-236, Edmonton, Alberta, Canada.
- Kays, R.W. and D.E. Wilson. 2002. *Mammals of North America*. Princeton University Press, New Jersey, USA.
- Keith, L. B. 1963. *Wildlife's ten-year cycle*. University of Wisconsin Press, Madison, USA.
- Keith, L. B. 1981. Population dynamics of hares. *Proceedings of World Lagomorph Conference*, University of Guelph, Ontario, Canada 395–440.
- Keith, L. B. 1990. Dynamics of snowshoe hare populations. Pages 119–195 In H. H. Genoways, editor. *Current mammalogy*. Plenum Press, New York, New York, USA.
- Keith, L. B., S. E. M. Bloomer, and T. Willebrand. 1993. Dynamics of a snowshoe hare population in a fragmented habitat. *Canadian Journal of Zoology* 71:1385–1392.

- Keith, L. B., J. R. Cary, O. J. Rongstad, and M. C. Brittingham. 1984. Demography and ecology of a declining snowshoe hare population. *Wildlife Monographs* 90:3–43.
- Keith, L. B. and D. C. Surrindi. 1971. Effects of fire on a snowshoe hare population. *Journal of Wildlife Management* 35:16–26.
- Keith, L. B., A. W. Todd, C. J. Brand, R. S. Adamcik, and D. H. Rusch. 1977. An analysis of predation during cyclic fluctuation of snowshoe hares. *Proceedings XIII International Congress of Game Biologists*. Athens, Georgia, USA.
- Keith, L. B. and L. A. Windberg. 1978. A demographic analysis of the snowshoe hare cycle. *Wildlife Monographs* 58:1–70.
- Kelsall, J. P., E. S. Telfer, and T. D. Wright. 1977. The effects of fire on the ecology of the boreal forest, with particular reference to the Canadian north: a review and selected bibliography. *Canadian Wildlife Service, Occasional Paper No. 32*. Ottawa, Canada.
- Kemp, G. A. and L. B. Keith. 1970. Dynamics and regulation of red squirrel (*Tamiasciurus hudsonicus*) populations. *Ecology* 51:763–779.
- Kendall, K. C. and K. S. McKelvey. 2008. Hair Collection. Pages 141–182. in Long, R. A., P. MacKay, J. C. Ray, and W. J. Zielinski (eds.). *Noninvasive Survey Methods for North American Carnivores*. Island Press, Washington D.C., USA.
- Kerr, J. T. and L. Packer. 1998. Effects of climate change on Canadian mammal species richness. *Environmental Monitoring and Assessment* 49:263–270.
- Kesterson, M. B. 1988. Lynx home range and spatial organization in relation to population density and prey abundance. Thesis, University of Alaska, Fairbanks, Alaska, USA.
- Kilgore, B. M. and M. L. Heinselman. 1990. Fire in wilderness ecosystems. Pages 297–335 in Hendee, J. C., G. H. Stankey, and R. C. Lucas editors. *Wilderness management*. 2nd Edition. North American Press, Golden, Colorado, USA.
- Kilham, L. 1954. Territorial behaviour of red squirrel. *Journal of Mammalogy* 35:252–253.
- Kleiman, D. G. and J. F. Eisenberg. 1973. Comparisons of canid and felid social systems from an evolutionary perspective. *Animal Behaviour* 21:637–659.
- Klenner, W. and C. J. Krebs. 1991. Red squirrel population dynamics. I. The effect of supplemental food on demography. *Journal of Animal Ecology* 60:961–978.
- Klugh, A. B. 1927. Ecology of the red squirrel. *Journal of Mammalogy* 8:1–32.
- Koch, P. 1996. Lodgepole pine in North America. Volume I. Forest Products Society, Madison, Wisconsin.
- Koehler, G. M. 1990a. Population and habitat characteristics of lynx and snowshoe hares in north central Washington. *Canadian Journal of Zoology* 68:845–851.
- Koehler, G. M. 1990b. Snowshoe hare, *Lepus americanus*, use of forest successional stage and population changes during 1985–1989 in north-central Washington. *Canadian Field-Naturalist* 105:291–293.
- Koehler, G. M. and K. B. Aubry. 1994. Lynx. Pages 74–98 In L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, and W. J. Zielinski, editors. *The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine*. USDA Forest Service, Rocky Mountain Forest and Range Experimental Station, Fort Collins, Colorado, USA.
- Koehler, G. M. and J. D. Brittell. 1990. Managing spruce-fir habitat for lynx and snowshoe hares. *Journal of Forestry* 88:10–14.
- Koehler, G. M., M. G. Hornocker, and H. S. Hash. 1979. Lynx movements and habitat use in Montana. *Canadian Field-Naturalist* 93:441–442.
- Koehler, G. M., B. T. Maletzke, J. A. von Kienast, K. B. Aubry, R. B. Wielgus, and R. H. Naney. 2008. Habitat fragmentation and the persistence of lynx populations in Washington State. *Journal of Wildlife Management* 72:1518–1524.
- Kolbe, J. A. and J. R. Squires. 2006. A longevity record for Canada lynx, *Lynx canadensis*, in western Montana. *Western North American Naturalist* 66:535–536.
- Kolbe, J. A. and J. R. Squires. 2007. Circadian activity patterns of Canada lynx in western Montana. *Journal of Wildlife Management* 71:1607–1611.

- Kolbe, J. A., J. R. Squires, and T. W. Parker. 2003. An effective box trap for capturing lynx. *Wildlife Society Bulletin* 31:980-985.
- Kolbe, J. A., J. R. Squires, D. H. Pletscher, and L. F. Ruggiero. 2007. The effect of snowmobile trails on coyote movements within lynx home ranges. *Journal of Wildlife Management* 71:1409-1418.
- Korpimäki, E., K. Norrdahl, and T. Rinta-Jaskari. 1991. Responses of stoats and least weasels to fluctuating food abundances: is the low phase of the vole cycle due to mustelid predation? *Oecologia* 88:552-561.
- Krebs, C. J. 2011. Of lemmings and snowshoe hares: the ecology of northern Canada. *Philosophical Transactions of Royal Society Biological Sciences*, London, United Kingdom 278:481-489.
- Krebs, C. J., R. Boonstra, S. Boutin, and A. R. E. Sinclair. 2001a. What drives the 10-year cycle of snowshoe hares? *BioScience* pp. 25-35.
- Krebs, C. J., R. Boonstra, S. Boutin, and A. R. E. Sinclair. 2001b. Conclusions and future directions. Pages 491-501 in Krebs, C. J., S. Boutin, and R. Boonstra, *Ecosystem Dynamics of the Boreal Forest: The Kluane Project*, Oxford University Press, New York, NY. 511 pp.
- Krebs, C. J., S. Boutin, R. Boonstra, A. R. E. Sinclair, J. N. M. Smith, M. R. T. Dale, K. Martin, and R. Turkington. 1995. Impact of food and predation on the snowshoe hare cycle. *Science* 269:1112-1115.
- Krebs, C. J., S. Boutin, and B. S. Gilbert. 1986. A natural feeding experiment on a declining snowshoe hare population. *Oecologia* 70:194-197.
- Krefting, L.W. 1975. The effect of white-tailed deer and snowshoe hare browsing on trees and shrubs in northern Minnesota. Technical Bulletin 302, Forestry Series 18, Agricultural Experiment Station, University of Minnesota, St. Paul, USA.
- Kreyling, J., A. Schmiedinger, E. MacDonald, and C. Beiekuhnlein. 2008. Potential of natural tree regeneration after clearcutting in subalpine forests. *Western Journal of Applied Forestry* 23:46-52.
- Krohn, W. B. and C. L. Hoving. 2010. Early Maine wildlife. Historical accounts of Canada lynx, moose, mountain lion, white-tailed deer, wolverine, wolves, and woodland caribou, 1603 - 1930. University of Maine Press, Orono, Maine, USA.
- Kuchler, A. W. 1964. Potential natural vegetation of the conterminous United States (map and manual). American Geographical Society Special Publication 36. Brooklyn, New York, USA.
- Kuehn, D. W. 1989. Winter foods of fishers during a snowshoe hare decline. *Journal of Wildlife Management* 53:688-692.
- Lachowski H. J. 1997. Relationships among prey abundance, habitat, and American marten in northern Maine. M. S. Thesis, University of Maine, Orono, Maine, USA.
- Lair, H. 1985. Mating seasons and fertility of red squirrels in southern Quebec *Canadian Journal of Zoology* 63:2323-2327.
- Lariviere, S. and L. R. Walton. 1997. *Lynx rufus*. *Mammalian Species* 563:1-8.
- Larsen, J. A. 1980. The boreal ecosystem. Academic Press, Inc. New York. 500 pp.
- Larsen, K. W. and S. Boutin. 1995. Exploring territory quality in the North American red squirrel through removal experiments. *Canadian Journal of Zoology* 73:1115-1122.
- Layne, J. N. 1954. The biology of the red squirrel, *Tamiasciurus hudsonicus loquax* (Bangs), in central New York. *Ecological Monographs* 24:227-267.
- Lewis, C. W., K. E. Hodges, G. M. Koehler, and L. S. Mills. 2011. Influence of stand and landscape features on snowshoe hare abundance in fragmented forests. *Journal of Mammalogy* 92:561-567.
- Lillybridge, T. R., B. L. Kovalchik, C. K. Williams, and B. G. Smith. 1995. Field guide for forested plant associations of the Wenatchee National Forest. USDA Forest Service, Pacific Northwest Research Station. General Technical Report PNW-GTR-359, Portland, Oregon, USA.
- Linden, D. W. 2006. Modeling current and historic habitat for Canada lynx (*Lynx canadensis*) in the upper peninsula of Michigan. Thesis, Michigan State University Lansing, Michigan, USA.
- Linden, D. W., H. Campa, G. J. Roloff, D. E. Beyer, and K. F. Millenbah. 2011. Modeling habitat potential for Canada

- lynx in Michigan. *Wildlife Society Bulletin* 35:20–26.
- Litvaitis, J. A. 1984. Bobcat movements in relation to prey density. Dissertation, University of Maine, Orono, Maine, USA.
- Litvaitis, J. A. 1992. Niche relations between coyotes and sympatric Carnivora. Pages 73–85 in A. H. Boer, editor. *Ecology and management of the eastern coyote*. University of New Brunswick Wildlife Research Unit, Fredericton, New Brunswick, Canada.
- Litvaitis, J. A. and D. J. Harrison. 1989. Bobcat-coyote niche relationships during a period of coyote population increase. *Canadian Journal of Zoology* 67:1180–1188.
- Litvaitis, J. A., D. Kingman, Jr., J. Lanier, and E. Orff. 1991. Status of lynx in New Hampshire. *Transactions of the Northeast Section of The Wildlife Society* 48:70–75.
- Litvaitis, J. A., J. A. Sherbourne, and J. A. Bissonette. 1985. Influence of understory characteristics on snowshoe hare habitat use and density. *Journal of Wildlife Management* 49:866–873.
- Litvaitis, J. A., J. A. Sherbourne, and J. A. Bissonette. 1986. Bobcat habitat use and home range size in relation to prey density. *Journal of Wildlife Management* 50:110–117.
- Long, R. A., T. M. Donovan, P. MacKay, W. J. Zielinski, and J. S. Buzas. 2007. Effectiveness of scat detection dogs for detecting forest carnivores. *Journal of Wildlife Management* 71:2007–2017.
- Lorimer, C. G. and A. S. White. 2003. Scale and frequency of natural disturbances in the northeastern U.S.: implications for early successional forest habitats and regional age distributions. *Forest Ecology and Management* 185:41–64.
- Losensky, J. B. 1993. Historical vegetation in Region One by climatic section, draft revision 2. Unpublished report, USDA Forest Service, Northern Region. Missoula, Montana, USA.
- Luttich, S., D. H. Rusch, E. C. Meslow, and L. B. Keith. 1970. Ecology of red-tailed hawk predation in Alberta. *Ecology* 51:190–203.
- Major, A. R. 1989. Lynx, *Lynx canadensis canadensis* (Kerr) predation patterns and habitat use in the Yukon Territory, Canada. Thesis, State University of New York, Syracuse, New York, USA.
- Major, J. T. and J. A. Sherburne. 1987. Interspecific relationships of coyotes, bobcats and foxes in western Maine. *Journal of Wildlife Management* 51:606–616.
- Malaney, J. L. and J. K. Frey. 2006. Summer habitat use by snowshoe hare and mountain cottontail at their southern zone of sympatry. *Journal of Wildlife Management* 70:877–883.
- Maletzke, B. T. 2004. Winter habitat selection of lynx (*Lynx canadensis*) in northern Washington. Thesis, Washington State University, Pullman, Washington, USA.
- Maletzke, B. T., G. M. Koehler, R. B. Wielgus, and K. B. Aubry. 2008. Habitat conditions associated with lynx hunting behavior during winter in Northern Washington. *Journal of Wildlife Management* 72:1473–1478.
- Malloy, J. C. 2000. Snowshoe hare, *Lepus americanus*, fecal pellet fluctuations in western Montana. *Canadian Field-Naturalist* 114:409–412.
- Marshall, W. H. 1946. Winter food habits of the pine marten in Montana. *Journal of Mammalogy* 27:83–84.
- McCann, N. P. 2006. Using pellet counts to predict snowshoe hare density, snowshoe hare habitat-use, and Canada lynx habitat-use in Minnesota. Thesis, University of Minnesota, Duluth, Minnesota, USA.
- McCann, N. P. and R. A. Moen. 2011. Mapping potential core areas for lynx (*Lynx canadensis*) using pellet counts from snowshoe hares (*Lepus americanus*) and satellite imagery. *Canadian Journal of Zoology* 89:509–516.
- McCann, N. P., R. A. Moen, and G. J. Niemi. 2008. Using pellet counts to estimate snowshoe hare numbers in Minnesota. *Journal of Wildlife Management* 72: 955–958.
- McCord, C. M. and J. E. Cardoza. 1982. Bobcat and lynx. Pages 728–766 in Chapman, J. A. and G. A. Feldhamer, editors. *Wild Mammals of North America*. Johns Hopkins University Press, Baltimore, Maryland, USA.
- McIntyre, C. L. and L. G. Adams. 1999. Reproductive characteristics of migratory golden eagles in Denali National Park, Alaska. *Condor* 101:115–123.
- McKelvey, K. S., K. B. Aubry, J. K. Agee, S. W. Buskirk, L. F. Ruggiero, and G. M. Koehler. 2000a. Lynx conservation in an ecosystem management context. Pages 419–441 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler,

- C. J. Krebs, K. S. McKelvey, and J. R. Squires, editors. Ecology and conservation of lynx in the United States. University Press of Colorado. Boulder, Colorado, USA.
- McKelvey, K. S., K. B. Aubry, and Y. K. Ortega. 2000b. History and distribution of lynx in the contiguous United States. Pages 207–264 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, editors. Ecology and conservation of lynx in the United States. University Press of Colorado. Boulder, Colorado, USA.
- McKelvey, K. S., S. W. Buskirk, and C. J. Krebs. 2000c. Theoretical insights into the population viability of lynx. Pages 21–37 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, editors. Ecology and conservation of lynx in the United States. University Press of Colorado. Boulder, Colorado, USA.
- McKelvey, K. S., J. J. Claar, G. W. McDaniel, and G. Hanvey. 1999. National lynx detection protocol. USDA Forest Service, Rocky Mountain Research Station, Missoula, Montana, USA.
- McKelvey, K. S., J. P. Copeland, M. K. Schwartz, J. S. Littell, K. B. Aubry, J. R. Squires, S. A. Parks, M. M. Elsner, and G. S. Mauger. 2011. Climate change predicted to shift wolverine distributions, connectivity, and dispersal corridors. *Ecological Applications* 21(8):2882-2897.
- McKelvey, K.S., J. Kienast, K. B. Aubry, G. M. Koehler, B. T. Maletzke, J. R. Squires, E. L. Lindquist, S. Loch, and M. K. Schwartz. 2006. DNA analysis of hair and scat collected along snow tracks to document the presence of Canada lynx. *Wildlife Society Bulletin* 34: 451-455.
- McKelvey, K. S., G. W. McDaniel, L. S. Mills, and P. C. Griffin. 2002. Effects of plot size and shape on pellet density estimates for snowshoe hares. *Wildlife Society Bulletin* 30(3):751–755.
- McKelvey, K. S., Y. K. Ortega, G. M. Koehler, K. B. Aubry, and J. D. Brittell. 2000d. Canada lynx habitat and topographic use patterns in north central Washington: a reanalysis. Pages 307–336 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, editors. Ecology and conservation of lynx in the United States. University Press of Colorado. Boulder, Colorado, USA.
- McKenzie, D., Z. Gedalof, D. L. Peterson, and P. Mote. 2004. Climatic change, wildfire, and conservation. *Conservation Biology* 18:890–902.
- McNab, W. H. and P. E. Avers (comps.). 1994. Ecological subregions of the United States: Section descriptions. Admin. Publication WO-WSA-5. USDA Forest Service, Washington, D.C. 267 pp.
- McNab, W. H., D. T. Cleland, J.A. Freeouf, J. E. Keys, Jr., G. J. Nowacki, and C. A. Carpenter, compilers. 2005. Description of ecological subregions: sections of the conterminous United States [CD-ROM]. Washington, DC: U.S. Department of Agriculture, Forest Service. 80 p.
- Meaney, C. and G. P. Beauvais. 2004. Species Assessment for Canada Lynx (*Lynx canadensis*) in Wyoming. USDI Bureau of Land Management, Cheyenne, Wyoming, USA.
- Mech, L. D. 1973. Canadian lynx invasion of Minnesota. *Biological Conservation* 5:151–152.
- Mech, L. D. 1980. Age, sex, reproduction, and spatial organization of lynxes colonizing northeastern Minnesota. *Journal of Mammalogy* 61:261–267.
- Meng, H. 1959. Food habits of nesting Cooper's hawks and goshawks in New York and Pennsylvania. *Wilson Bulletin* 71:169–174.
- Meslow, E. C. and L. B. Keith. 1968. Demographic parameters of a snowshoe hare population. *Journal of Wildlife Management* 32:812–834.
- Miller, M.A. 2005. Snowshoe hare habitat relationships in successional stages of spruce-fir, lodgepole pine, and aspen cover types in northwest Colorado. Thesis, Colorado State University, Fort Collins, Colorado, USA.
- Miller, G. S. and J. R. Kellogg. 1955. List of North American recent mammals. U. S. National Museum Bulletin. 205. 954 pp.
- Mills, L. S, P. G. Griffin, K. E. Hodges, K. S. McKelvey, L. F. Ruggiero, C. Henderson, and T. Ulizio. 2005. Pellet count indices compared to mark-recapture estimates for evaluating snowshoe hare density. *Journal of Wildlife Management* 69:1053–1062.

- Ministère de l'Environnement et de la Faune. 1995. Plan de gestion du lynx du Canada au Québec 1995 : Objectifs de gestion et stratégie d'exploitation. Ministère de l'Environnement et de la Faune du Québec.
- Ministry of Forests, Lands, and Natural Resource Operations. 2012. 2012–2014 hunting and trapping regulation synopsis-complete. Ministry of Forests, Lands, and Natural Resource Operations, Victoria, British Columbia, Canada.
- Minnesota Department of Natural Resources. 2006. Canada lynx sightings in Minnesota (March 2000 – November 14, 2006). Unpublished report. http://www.dnr.state.mn.us/eco/nhnrp/research/lynx_sightings.html Accessed August 2013.
- Moen, R. 2009. Canada Lynx in the Great Lakes Region 2008 Annual Report. NRRI Technical Report No. NRRI/TR-2009-06, Release 1.0, 1-34.
- Moen, R. and C. L. Burdett. 2009. Den sites of radiocollared Canada lynx in Minnesota 2004-2007. NRRI Technical Report No. NRRI/TR-2009/07.
- Moen, R., C. L. Burdett, and G. J. Niemi. 2008. Movement and habitat use of Canada lynx during denning in Minnesota. *Journal of Wildlife Management* 72:1507–1513.
- Moen, R., G. Niemi, J. Palakovich and C. L. Burdett. 2006. Snowtrack surveys for Canada lynx presence in Minnesota west of Highway 53. 2005 Annual Report to Minnesota Department of Natural Resources. NRRI Technical Report No. NRRI/TR-2006-17. 29 pp.
- Moen, R., J. M. Rasmussen, C. L. Burdett, and K. M. Pelican. 2010a. Hematology, serum chemistry, and body mass of free-ranging and captive Canada lynx in Minnesota. *Journal of Wildlife Diseases* 46:13-22.
- Moen, R., L. Terwilliger, A. R. Dohmen, and S. C. Catton. 2010b. Habitat and road use by Canada lynx making long-distance movements. Natural Resource Research Institute, NRRI TR-2010/02 University of Minnesota, Duluth, USA. http://www.nrri.umn.edu/lynx/publications/Moen_et_al_NRRI_TR_2010_02.pdf Accessed August 2013.
- Moen, R. A., S.K. Windels, B. Hansen. 2012. Suitability of Voyageurs National Park as Canada lynx habitat. *Natural Areas Journal* 32(4):348-355.
- Monthey, R. W. 1986. Responses of snowshoe hares, *Lepus americanus*, to timber harvesting in northern Maine. *Canadian Field-Naturalist* 100:568–570.
- More, G. 1976. Some winter food habits of lynx (*Felis lynx*) in the southern Mackenzie District, Northwest Territories. *Canadian Field-Naturalist* 90:499–500.
- Morgan, P., S. C. Bunting, A. E. Black, T. Merrill, and S. Barrett. 1998. Past and present fire regimes in the Interior Columbia River Basin. In K. Close and R. A. Bartlette, editors. *Fire management under fire (adapting to change)*, Proceedings for the 1994 Interior West Fire Council meeting and program; 1994 November 1–4; Coeur d'Alene, ID. International Association of Wildland Fire, Fairfield, Washington, USA.
- Mowat, G., K. G. Poole, and M. O'Donoghue. 2000. Ecology of lynx in northern Canada and Alaska. Pages 265–306 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado. Boulder, Colorado, USA.
- Mowat, G. and B. G. Slough. 1998. Some observations on the natural history and behaviour of the Canada lynx, *Lynx canadensis*. *Canadian Field Naturalist* 112:32–36.
- Mowat, G. and B. G. Slough. 2003. Habitat preference of Canada lynx through a cycle in snowshoe hare abundance. *Journal of Zoology* 81:1736–1745.
- Mowat, G., B. G. Slough, and S. Boutin. 1996. Lynx recruitment during a snowshoe hare population peak and decline in southwest Yukon. *Journal of Wildlife Management* 60:441–452.
- Mowat, G. G. B. Slough, and R. Rivard. 1994. A comparison of three live capturing devices for lynx: capture efficiency and injuries. *Wildlife Society Bulletin* 22:644-650.
- Murray, D. L. 2000. A geographic analysis of snowshoe hare population demography. *Canadian Journal of Zoology* 78:1207–1217.
- Murray, D.L. 2003. Snowshoe hare and other hares. Pages 147–175 in Feldhamer, G.A. and B. Thompson, editors. *Wild mammals of North America*. Vol. II. Johns Hopkins University Press, Baltimore, Maryland, USA.
- Murray, D. L. and S. Boutin. 1991. The influence of snow on lynx and coyote movements: does morphology affect be-

- havior? *Oecologia*. 88:463–469.
- Murray, D. L., S. Boutin, and M. O'Donoghue. 1994. Winter habitat selection by lynx and coyotes in relation to snowshoe hare abundance. *Canadian Journal of Zoology* 72:1444–1451.
- Murray, D. L., S. Boutin, M. O'Donoghue, and V. O. Nams. 1995. Hunting behavior of sympatric felid and canid in relation to vegetative cover. *Animal Behavior* 50:1203–1210.
- Murray, D. L., J. R. Cary and L. B. Keith. 1997. Interactive effects of sublethal nematodes and nutritional status on snowshoe hare vulnerability to predation. *Journal of Animal Ecology* 66:250–264.
- Murray, D. L., Roth, J. D., Ellsworth E., Wirsing, A. J., and Steury, T. D. 2002. Estimating low-density snowshoe hare populations using fecal pellet counts. *Canadian Journal of Zoology* 80:771–781.
- Murray, D. L., T. D. Steury, and J. D. Roth. 2008. Assessment of Canada Lynx research and conservation needs in the southern range: another kick at the cat. *Journal of Wildlife Management* 72:1463–1472.
- Nagorsen, D. W. 1985. A morphometric study of geographic variation in the snowshoe hare (*Lepus americanus*). *Canadian Journal of Zoology* 63:567–579.
- Nellis, C. H., S. P. Wetmore, and L. B. Keith. 1972. Lynx-prey interactions in central Alberta. *Journal of Wildlife Management* 36:320–329.
- Newbury, T. L. and N. P. P. Simon. 2005. The effects of clearcutting on snowshoe hare (*Lepus americanus*) relative abundance in central Labrador. *Forest Ecology and Management* 210:131–142.
- Nybakk, K., M. Kjørstad, K. Overskaug, T. Kvam, J. D. C. Linnell, R. Andersen, and F. Bernsten. 1996. Experiences with live-capture and radio collaring of lynx *Lynx lynx* in Norway. *Fauna Norv. Ser. A*. 17:17–26.
- Obbard, M.E. 1987. Red squirrel. Pages 264–281 in M. Novak, J.A. Baker, M.E. Obbard, and B. Malloch, eds. *Wild fur-bearer management and conservation in North America*. Ontario Trappers Association, North Bay.
- O'Donoghue, M. 1994. Early survival of juvenile snowshoe hares. *Ecology* 75:1582–1592.
- O'Donoghue, M. 1997. Responses of coyotes and lynx to the snowshoe hare cycle. Dissertation, University of British Columbia. Vancouver, British Columbia, Canada.
- O'Donoghue, M., S. Boutin, C. J. Krebs, and E. J. Hofer. 1997. Numerical responses of coyotes and lynx to the snowshoe hare cycle. *Oikos* 74:115–121.
- O'Donoghue, M., S. Boutin, C. J. Krebs, G. Zuleta, D. L. Murray, and E. J. Hofer. 1998. Functional responses of coyotes and lynx to the snowshoe hare cycle. *Ecology* 79:1193–1208.
- O'Donoghue, M., S. Boutin, D. L. Murray, C. J. Krebs, E. J. Hofer, U. R. S. Breitenmoser, C. Breitenmoser-Wuersten, G. Zuleta, C. Doyle, and V. O. Nams. 2001. Coyotes and Lynx. Pages 275–316 in Krebs, C. J., S. Boutin, and R. Boonstra, *Ecosystem Dynamics of the Boreal Forest: The Kluane Project*, Oxford University Press, New York, New York, USA.
- O'Donoghue, M. and C. J. Krebs. 1992. Effects of supplemental food on snowshoe hare reproduction and juvenile growth at a cyclic population peak. *Journal of Animal Ecology* 61:631–641.
- Obbard, M. E. 1987. Red squirrel. Pages 264–281 in M. Novak, J. A. Baker, M. E. Obbard and B. Malloch, editors. *Wild fur-bearer management and conservation in North America*. Ontario Trappers Association, North Bay, Canada.
- Oldemeyer, J. L. 1983. Browse production and its use by moose and snowshoe hares at the Kenai Moose Research Center, Alaska. *Journal of Wildlife Management* 47:486–496.
- Ollinger, S. V., C. L. Goodale, K. Hayhoe, and J. P. Henkins. 2008. Potential effects of climate change and rising CO₂ on ecosystem processes in northeastern US forests. *Mitigation and Adaptations Strategies for Global Change* 13:467–485.
- Oliver, C. D. 1980. Forest development in North America following major disturbances. *Forest Ecology and Management* 3:153–168.
- Oliver, C.D. and B.C. Larson. 1996. *Forest Stand Dynamics*. John Wiley and Sons, Inc. 520 pp.
- Olsen, G. H., R. G. Linscombe, V. L. Wright, and R. A. Holmes. 1988. Reducing injuries to terrestrial furbearers using padded foothold traps. *Wildlife Society Bulletin* 16:303–307.
- Olson, L. E., J. R. Squires, N. J. DeCesare and J. A. Kolbe. 2011. Den use and activity patterns in female Canada lynx

- (*Lynx canadensis*) in the Northern Rocky Mountains. Northwest Science 85:455–462.
- Oosting, H. J. 1956. The study of plant communities. W. H. Freeman and Co., San Francisco, California, USA.
- Organ, J. F., J. H. Vashon, J. E. McDonald, Jr., A. D. Vashon, S. M. Crowley, W. J. Jakubas, G. J. Matula, Jr., and A. L. Meehan. 2008. Within-stand selection of Canada lynx natal dens in Northwest Maine, USA. Journal of Wildlife Management 72:1514–1517.
- Ozoga, J. J. and E. M. Harger. 1966. Winter activities and feeding habits of northern Michigan coyotes. Journal of Wildlife Management 30:809–818.
- Parker, G. R. 1981. Winter habitat use and hunting activities of lynx (*Lynx canadensis*) on Cape Breton Island, Nova Scotia. Pages 221-248 in J. A. Chapman and D. Pursley, editors. Proceedings Worldwide Furbearer Conference, August 3–11, 1980. Frostburg, Maryland, USA.
- Parker, G. R. 1984. Use of spruce plantations by snowshoe hare in New Brunswick. Forestry Chronicle 60:162–166.
- Parker, G. R. 1986. The importance of cover on use of conifer plantations by snowshoe hares in northern New Brunswick. Forestry Chronicle 62:159–163.
- Parker, G. R., J. W. Maxwell, L. D. Morton, and G. E. J. Smith. 1983. The ecology of the lynx (*Lynx canadensis*) on Cape Breton Island. Canadian Journal of Zoology 61:770–786.
- Parnesan, C. 2006. Ecological and evolutionary responses to recent climate change. Annual Review of Ecology, Evolution, and Systematics 37:637–669.
- Pastor, J. and D. J. Mladenoff. 1992. The southern boreal-northern hardwood forest border. Pages 216-240 in H. H. Shugart, R. Leemans, and G.B. Bonan, editors. A systems analysis of the global boreal forest. Cambridge Univ. Press, Cambridge, England.
- Patton, G. 2006. Idaho Snow track survey, winter 2006. Unpublished report. Idaho Dept. of Fish and Game. 31 pp.
- Pauls, R. W. 1978. Behavioural strategies relevant to the energy economy of the red squirrel (*Tamiasciurus hudsonicus*). Canadian Journal of Zoology 56:1519–1525.
- Pease, J. L., R. H. Vowles, and L. B. Keith. 1979. Interaction of snowshoe hares and woody vegetation. Journal of Wildlife Management 43:43–60.
- Pehrson, A. 1983. Digestibility and retention of food components in caged mountain hares *Lepus timidus* during the winter. Ecography 6:395–403.
- Pennak, R. 1963. Ecological and radiocarbon correlations in some Colorado mountain lake and bog deposits. Ecology 44:1–15.
- Peterson, R. L. 1966. The mammals of eastern Canada. Oxford University Press, Toronto, Ontario, Canada.
- Pfister, R. D., B. L. Kovalchik, S. F. Arno, and R. C. Presby. 1977. Forest habitat types of Montana. USDA Forest Service, Intermountain Forest and Range Experiment Station, General Technical Report INT-34. Ogden, Utah, USA.
- Pietz, P. J. and J. R. Tester. 1983. Habitat selection by snowshoe hares in north central Minnesota. Journal of Wildlife Management 47(3):686-696.
- Poole, K. G. 1994. Characteristics of an unharvested lynx population during a snowshoe hare decline. Journal of Wildlife Management 58:608–618.
- Poole, K. G. 1997. Dispersal patterns of lynx in the Northwest Territories. Journal of Wildlife Management 61:497–505.
- Poole, K.G. and R. P. Graf. 1996. Winter diet of marten during a snowshoe hare decline. Canadian Journal of Zoology 74:456–466.
- Poole, K. G., L. A. Wakelyn, and P. N. Nicklen. 1996. Habitat selection by lynx in the Northwest Territories. Canadian Journal of Zoology 74:845–850.
- Poszig, D., C.D. Apps, A. Dibb. 2004. Predation on two mule deer, *Odocoileus hemionus*, by a Canada lynx, *Lynx canadensis* in the southern Canadian Rocky Mountains. Canadian Field-Naturalist 118:191–194.
- Potvin, F., L. Breton, and R. Courtois. 2005. Response of beaver, moose, and snowshoe hare to clear-cutting in a Quebec boreal forest: a reassessment 10 years after cut. Canadian Journal of Forestry Resources 35:151–160.

- Powell, D. C., C. G. Johnson, Jr., E. A. Crowe, A. Wells, and D. K. Swanson. 2007. Potential vegetation hierarchy for the Blue Mountains Section of northeastern Oregon, southeastern Washington, and west-central Idaho. Pacific Northwest Research Station, General Technical Report PNW-GTR-709, Portland, Oregon, USA.
- Prasad, A. M., L. R. Iverson, S. Matthews, and M. Peters. 2007. A climate change atlas for 134 forest tree species of the eastern U.S., Delaware, OH. USDA Forest Service, Northern Research Station.
- Pruitt, Q. O., Jr., and C. V. Lucier. 1958. Winter activity of red squirrels in interior Alaska. *Journal of Mammalogy* 39:443–444.
- Quick, H. F. 1955. Food habits of marten (*Martes americana*) in northern British Columbia, *Canadian Field-Naturalist* 69:144–147.
- Quigley, T. M., R. Haynes, R. W. Graham, and T. Russell, technical editors. 1996. Integrated scientific assessment for ecosystem management in the interior Columbia basin and portions of the Klamath and Great Basins. USDA Forest Service, Pacific Northwest Research Station. General Technical Report PNW-GTR-382. Portland, Oregon, USA.
- Quinn, N. W. S. and G. Parker. 1987. Lynx. Pages 683–694 in Novak, N. and M. Obbard editors. *Wild furbearer management and conservation in North America*. Ministry of Natural Resources, Toronto, Ontario, Canada.
- Quinn, N. W. S. and J. E. Thompson. 1987. Dynamics of an exploited Canada lynx population in Ontario. *Journal of Wildlife Management* 51:297–305.
- Radwan, M. A. and D. L. Campbell. 1968. Snowshoe hare preference of spotted catsear flowers in western Washington. *Journal of Wildlife Management* 32:104–108.
- Raffa, K. F., B. K. Aukema, B. J. Bentz, A. L. Carroll, J. A. Hicke, M. G. Turner, and W. H. Romme. 2008. Cross-scale drivers of natural disturbances prone to anthropogenic amplification: the dynamics of bark beetle eruptions. *BioScience* 58:501–517.
- Raine, R. M. 1987. Winter food habits and foraging behaviour of fishers (*Martes pennanti*) and martens (*Martes americana*) in southeastern Manitoba. *Canadian Journal of Zoology* 65:745–747.
- Ranta, E., V. Kaitala, and P. Lundberg. 1997. The spatial dimension in population fluctuations. *Science* 278:1621–1623.
- Rausch, R. A. and A. M. Pearson. 1972. Notes on the wolverine in Alaska and the Yukon Territory. *Journal of Wildlife Management* 36:249–268.
- Ray, J. C., J. E. Organ, and M. S. O'Brien. 2002. Canada lynx (*Lynx canadensis*) in the northern Appalachians: current knowledge, research priorities, and a call for regional cooperation and action. Report of a meeting held in Portland, Maine April, 2002. Wildlife Conservation Society, Toronto, Ontario, Canada. <http://carnivorecology.free.fr/pdf/WCSlynx.pdf> Accessed August 2013.
- Reichard, T. A. 1976. Spring food habits and feeding behavior of fox squirrels and red squirrels. *American Midland Naturalist* 96:443–450.
- Robinson, L. 2006. Ecological relationships among partial harvesting, vegetation, snowshoe hares, and Canada lynx in Maine. M. S. Thesis, University of Maine, Orono, Maine, USA.
- Rodgers, A. R. and A. R. E. Sinclair. 1997. Diet choice and nutrition of captive snowshoe hares (*Lepus americanus*): Interactions of energy, protein, and plant secondary compounds. *Ecoscience* 4:163–169.
- Rogowitz, G. L. 1988. Forage quality and use of reforested habitats by snowshoe hares. *Canadian Journal of Zoology* 66:2080–2083.
- Rohner, C. and C. J. Krebs. 1996. Owl predation on snowshoe hares: consequences of antipredator behavior. *Oecologia* 108(2):303–310.
- Root, T. L., J. T. Price, K. R. Hall, S. H. Schneider, C. Rosenzweig, and J. A. Pounds. 2003. Fingerprints of global warming on wild animals and plants. *Nature* 421:57–60.
- Rosenzweig, C., G. Casassa, D.J. Karoly, A. Imeson, C. Liu, A. Menzel, S. Rawlins, T.L. Root, B. Seguin, and P. Tryjanowski. 2007. Assessment of observed changes and responses in natural and managed systems. *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J.

- van der Linden and C.E. Hanson, editors. Cambridge University Press, Cambridge, UK, 79-131. <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter1.pdf> Accessed August 2013.
- Roth, J. D., J. D. Marshall, D. L. Murray, D. M. Nickerson, and T. D. Steury. 2007. Geographical gradients in diet affect population dynamics of Canada lynx. *Ecology* 88:2736–2743.
- Rothwell, R. 1979. Nest sites of red squirrels (*Tamiasciurus hudsonicus*) in the Laramie Range of southeastern Wyoming. *Journal of Mammalogy* 60:404–405.
- Route, B., S.K. Windels, and J. Schaberl. 2009. Status of Canada lynx in Voyageurs National Park, Minnesota, 2000-2004. NPS/GLKN/NRTR 172, 1-27. National Park Service, Natural Resources, Fort Collins, CO.
- Row, J. R., C. Gomez, E. L. Koen, J. Bowman, D. L. Murray, and P. J. Wilson. 2012. Dispersal promotes high gene flow among Canada lynx populations across mainland North America. *Conservation Genetics* 13:1259-1268.
- Rowe, J. S. 1972. Forest regions of Canada. Canadian Forestry Service, Publication 1300, Ottawa, Canada.
- Royama. T. 1992. Analytical population dynamics. Chapman and Hall Publishing Company, London, United Kingdom.
- Ruediger, B., J. Claar, S. Gniadek, B. Holt, L. Lewis, S. Mighton, B. Naney, G. Patton, T. Rinaldi, J. Trick, A. Vandehey, F. Wahl, N. Warren, D. Wenger, and A. Williamson. 2000. Canada lynx conservation assessment and strategy. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Forest Service Publication Number R1-00-53, Missoula, Montana, USA.
- Rueness, E. K., N. C. Stenseth, M. O'Donoghue, S. Boutin, H. Ellegren, and K. S. Jakobsen. 2003. Ecological and genetic spatial structuring in the Canadian lynx. *Nature* 425:69-72.
- Ruggiero, L. F., K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, technical editors. 2000a. Ecology and conservation of lynx in the United States. University Press of Colorado. Boulder, USA.
- Ruggiero, L. F., K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires. 2000b. The scientific basis for lynx conservation: qualified insights. Pages 443–454 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, editors. Ecology and conservation of lynx in the United States. University Press of Colorado. Boulder, Colorado, USA.
- Rusch, D. A. and W. G. Reeder. 1978. Population ecology of Alberta red squirrels. *Ecology* 59:400–420.
- Rusch, D. H., E. C. Meslow, P. D. Doerr, and L. B. Keith. 1972. Response of great horned owl populations to changing prey densities. *Journal of Wildlife Management* 36:282–296.
- Saunders, J. K., Jr. 1963a. Food habits of the lynx in Newfoundland. *Journal of Wildlife Management* 27:384–390.
- Saunders, J. K., Jr. 1963b. Movements and activities of the lynx in Newfoundland. *Journal of Wildlife Management* 2:390–400.
- Schauffler, M. and G. L. Jacobson. 2002. Persistence of coastal spruce refugia during the Holocene in northern New England, USA, detected by stand-scale pollen stratigraphies. *Journal of Ecology* 90:235–250.
- Schmitz, O. J., E. Post, C. E. Burns, and K. M. Johnston. 2003. Ecosystem responses to global climate change: moving beyond color mapping. *BioScience* 53:1199–1205.
- Schoennaegel, T., T. T. Veblen, and W. H. Romme. 2004. The interaction of fires, fuels, and climate across Rocky Mountain forests. *BioScience* 54:661–676.
- Schwartz, M. K., L. S. Mills, K. S. McKelvey, L. F. Ruggiero, and F. W. Allendorf. 2002. DNA reveals high dispersal synchronizing the population dynamics of Canada lynx. *Nature* 415:520–522.
- Schwartz, M. K., L. S. Mills, Y. Ortega, L. F. Ruggiero, and F. W. Allendorf. 2003. Landscape location affects genetic variation of Canada lynx (*Lynx canadensis*). *Molecular Ecology* 12:1807-1816.
- Schwartz, M. K., K. L. Pilgrim, K. S. McKelvey, E. L. Linnquist, J. J. Claar, S. Loch, L. F. Ruggiero. 2004. Hybridization between Canada lynx and bobcats: genetic results and management implications. *Conservation Genetics* 5:349–355.
- Scott, D. P. and R., H. Yahner. 1989. Winter habitat and browse use by snowshoe hares, *Lepus americanus*, in a marginal habitat in Pennsylvania. *Canadian Field-Naturalist* 103:560–563.
- Scott, S. A. 2009. Spatio-temporal dynamics of snowshoe hare density and relationships to Canada lynx occurrence in northern Maine. M. S. Thesis, University of Maine, Orono, Maine, USA.

- Secombe-Hett, P. and R. Turkington. 2008. Summer diet selection of snowshoe hares: a test of nutritional hypotheses. *Oikos* 117:1874–1884.
- Seton, E. T. 1910. Life-histories of northern animals. Vol. I. Grass-eaters. Constable and Company, London, United Kingdom.
- Severaid, J. H. 1945. Pelage changes in the snowshoe hare (*Lepus americanus struotopus* Bangs). *Journal of Mammalogy* 26 (1):41-63.
- Seymour, R. S. 1992. The red spruce-balsam fir forest of Maine: evolution of silvicultural practice in response to stand development, patterns and disturbances. Pages 217-244 in the *Ecology and Silviculture of Mixed-Species Forests: A Festschrift for David M. Smith*. Kelly, M. J., B. C. Larson, and C. D. Oliver, editors. Kluwer Academic Publishers, Netherlands.
- Seymour, R. S. and M. L. Hunter Jr. 1992. New forestry in eastern spruce-fir forests: principles and applications in Maine. Maine Agricultural and Forest Experiment Station. University of Maine. Miscellaneous Publication 716. Orono, Maine, USA.
- Seymour, R. S., A. S. White and P. G. DeMaynadier. 2002. Natural disturbance regimes in northeastern North America – evaluating silvicultural systems using natural scales and frequencies. *Forest Ecology and Management* 155:357-367.
- Shenk, T. M. 2006. Wildlife research report: post release monitoring of lynx (*Lynx canadensis*) reintroduced to Colorado. July 1, 2005–June 30, 2006. Colorado Division of Wildlife. <http://wildlife.state.co.us/SiteCollectionDocuments/DOW/WildlifeSpecies/SpeciesOfConcern/Lynx/Reports/0506LynxResearchReport.pdf> Accessed August 2013.
- Shenk, T. M. 2007. Wildlife research report: post release monitoring of lynx (*Lynx canadensis*) reintroduced to Colorado. July 1, 2006–June 30, 2007. Colorado Division of Wildlife. <http://wildlife.state.co.us/SiteCollectionDocuments/DOW/WildlifeSpecies/SpeciesOfConcern/Lynx/Reports/ShenkFinal2006-07AnnualReportsecure.pdf> Accessed August 2013.
- Shenk, T. M. 2008. Wildlife research report: post release monitoring of lynx (*Lynx canadensis*) reintroduced to Colorado. July 1, 2007–June 30, 2008. Colorado Division of Wildlife. <http://wildlife.state.co.us/SiteCollectionDocuments/DOW/WildlifeSpecies/SpeciesOfConcern/Lynx/Reports/LynxAnnualReport2007-08.pdf> Accessed August 2013.
- Shenk, T. M. 2009. Wildlife research report: post release monitoring of lynx (*Lynx canadensis*) reintroduced to Colorado. July 1 2008–August 31, 2009. Colorado Division of Wildlife. <http://wildlife.state.co.us/SiteCollectionDocuments/DOW/WildlifeSpecies/SpeciesOfConcern/Lynx/Reports/LynxAnnualReport2008-2009.pdf> Accessed August 2013.
- Sherriff, M.J., C.J. Krebs, R. Boonstra. 2009. The sensitive hare: sublethal effects of predator stress on reproduction in snowshoe hares. *Journal of Animal Ecology* 78:1249–1258.
- Sievert, P. R. and L. B. Keith. 1985. Survival of snowshoe hares at a geographic range boundary. *Journal of Wildlife Management* 49:854–866.
- Simons, E. M. 2009. Influences of past and future forest management on the spatiotemporal dynamics of habitat supply for Canada lynx and American martens in northern Maine. Ph.D. dissertation, University of Maine, Orono, Maine USA.
- Simons-Legaard, E. M., D. J. Harrison, W. B. Krohn, and J. H. Vashon. 2013. Canada lynx occurrence and forest management in the Acadian forest. *Journal of Wildlife Management* 77:567–578.
- Sinclair, A. R. E., J. M. Gosline, G. Holdsworth, C. J. Krebs, S. Boutin, J. N. M. Smith, R. Boonstra, and M. Dale. 1993. Can the solar cycle and climate synchronize the snowshoe hare cycle in Canada? Evidence from tree rings and ice cores. *The American Naturalist* 141:173–198.
- Sinclair, A. R. E., C. J. Krebs, J. N. M. Smith, and S. Boutin. 1988. Population biology of snowshoe hares. III. Nutrition, plant secondary compounds and food limitation. *Journal of Animal Ecology* 57:787–806.
- Singleton, P. H., W. L. Gaines, and J. F. Lehmkuhl. 2002. Landscape permeability for large carnivores in Washington: a

- geographic information system weighted-distance and least-cost corridor assessment. USDA Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-549. Portland, Oregon, USA.
- Slough, B. G. 1999. Characteristics of Canada lynx, *Lynx canadensis*, maternal dens and denning habitat. *Canadian Field-Naturalist* 113:605–608.
- Slough, B. G. and G. Mowat. 1996. Lynx population dynamics in an untrapped refugium. *Journal of Wildlife Management* 60:946–961.
- Smith, C. C. 1968a. The adaptive nature of social organization in the genus of three squirrels *Tamiasciurus*. *Ecological Monographs* 38:31–63.
- Smith, C.H. 1983. Spatial trends in Canadian snowshoe hare, *Lepus americanus*, population cycles. *Canadian Field-Naturalist* 97:151–160.
- Smith, D. S. 1984. Habitat use, home range, and movements of bobcats in western Montana. Thesis, University of Montana, Missoula, Montana, USA.
- Smith, J. K. and W. C. Fischer. 1997. Fire ecology of the forest habitat types of northern Idaho. USDA Forest Service, Intermountain Research Station, General Technical Report INT-GTR-363. Ogden, Utah, USA.
- Smith, J. N. M., C. J. Krebs, A. R. E. Sinclair, and R. Boonstra. 1988. Population biology of snowshoe hares. II. Interactions with winter food plants. *Journal of Animal Ecology* 57:269–286.
- Smith, M. C. 1968b. Red squirrel responses to spruce cone failure in interior Alaska. *Journal of Wildlife Management* 32:305–317.
- Soutiere, E. C. 1979. Effects of timber harvesting on marten in Maine. *Journal of Wildlife Management* 43:850–860.
- Sprugel, D. G. 1976. Dynamic structure of wave-regenerated *Abies balsamea* forests in the North-eastern United States. *Journal of Ecology* 64:889–911.
- Squires, J. R., N. J. Decesare, J. A. Kolbe, and L. F. Ruggiero. 2008. Hierarchical den selection of Canada lynx in western Montana. *Journal of Wildlife Management* 72:1497–1506.
- Squires, J. R., N. J. DeCesare, J. A. Kolbe, and L. F. Ruggiero. 2010. Seasonal resource selection of Canada lynx in managed forests of the Northern Rocky Mountains. *Journal of Wildlife Management* 74:1648–1660.
- Squires, J. R., N. J. DeCesare, L. E. Olson, J. A. Kolbe, M. Hebblewhite, and S. A. Parks. 2013. Combining resource selection and movement behavior to predict corridors for Canada lynx at their southern range periphery. *Biological Conservation* 157:187–195.
- Squires, J. R., DeCesare, N. J., Tomson, S., Oakleaf, B., and L. F. Ruggiero. 2003. Distribution of lynx and other forest carnivores in the Wyoming Range, southcentral Wyoming: Final Report. USDA Forest Service, Rocky Mountain Research Station, Missoula, Montana, USA.
- Squires, J. R. and T. Laurion. 2000. Lynx home range and movements in Montana and Wyoming: preliminary results. Pages 337–349 in L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires, editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado. Boulder, Colorado, USA.
- Squires, J. R., K. S. McKelvey, and L. F. Ruggiero. 2004. A snow-tracking protocol used to delineate local lynx, *Lynx canadensis*, distributions. *Canadian Field-Naturalist* 118:583–589.
- Squires, J. R. and R. Oakleaf. 2005. Movements of a male Canada lynx crossing the Greater Yellowstone Area, including highways. *Northwest Science*. 79:196–201.
- Squires, J. R., L. E. Olson, D. L. Turner, N. J. DeCesare, and J. A. Kolbe. 2012. Estimating detection probability for Canada lynx *Lynx canadensis* using snow-track surveys in the northern Rocky Mountains, Montana, USA. *Wildlife Biology* 18:215–224.
- Squires, J. R. and L. F. Ruggiero. 2007. Winter prey selection of Canada lynx in northwestern Montana. *Journal of Wildlife Management* 71:310–315.
- Staples, W. R. 1995. Lynx and coyote diet and habitat relationships during a low hare population on the Kenai Peninsula, Alaska. Thesis, University of Alaska, Fairbanks, Alaska, USA.
- Steele, R., R. D. Pfister, R. A. Ryker, and J. A. Kittams. 1981. Forest habitat types of central Idaho. USDA Forest Ser-

- vice, Intermountain Forest and Ranger Experiment Station, General Technical Report INT-114. Ogden, Utah, USA.
- Stefan, C. I. 1998. Reproduction and pre-weaning survival in a cyclic population of snowshoe hares. Thesis, University of British Columbia, Vancouver, Canada.
- Stefan, C. I. and C. J. Krebs. 2001. Reproductive changes in a cyclic population of snowshoe hares. *Canadian Journal of Zoology* 79:2101–2108.
- Stenseth, N. C. 1995. Snowshoe hare populations: squeezed from below and above. *Science* 269:1061–1062.
- Stenseth, N. C., K. Chan, H. Tong, R. Boonstra, S. Boutin, C. J. Krebs, E. Post, M. O'Donoghue, N. G. Yoccoz, M. C. Forchhammer, and J. W. Hurrell. 1999. Common dynamic structure of Canada lynx populations within three climatic regions. *Science* 285:1071–1073.
- Stenseth, N. C., D. Ehrlich, E. K. Rueness, O. C. Lingjaerde, K. Chan, S. Boutin, M. O'Donoghue, D. A. Robinson, H. Viljugrein, and K. S. Jakobsen. 2004. The effect of climatic forcing on population synchrony and genetic structuring of the Canadian lynx. *Proceedings National Academy of Sciences* 101:6056–6061.
- Stenseth, N. C., W. Falck, O. N. Bjørnstad, and C. J. Krebs. 1997. Population regulation in snowshoe hare and Canadian lynx: Asymmetric food web configurations between hare and lynx. *Proceedings National Academy of Sciences* 94:5147–5152.
- Stephenson, R. O. 1984. The relationship of fire history to furbearer populations and harvest. Final Report, Federal Aid in Wildlife Restoration, Project W-22-2, Job 7.13R Alaska Dept. of Fish and Game, Juneau, Alaska, USA.
- Steury, T. D. and D. L. Murray. 2004. Modeling the reintroduction of lynx to the southern portion of its range. *Biological Conservation* 117:127–141.
- Stinson, D. W. 2001. Washington state recovery plan for the lynx. Washington Department of Fish and Wildlife, Olympia, Washington. 78 pp. + 5 maps. <http://wdfw.wa.gov/publications/00394/> Accessed August 2013.
- Strohm, S. and R. Tyson. 2009. The effects of habitat fragmentation on cyclic population dynamics: a numerical study. *Bulletin of Mathematical Biology* 71:1323–1348.
- Sullivan, T. P. and R. A. Moses. 1986. Red squirrel populations in natural and managed stands of lodgepole pine. *Journal of Wildlife Management* 50:595–601.
- Sullivan, T. P. and D. S. Sullivan. 1982. Barking damage by snowshoe hares and red squirrels in lodgepole pine stands in central British Columbia. *Canadian Journal of Forest Research* 12:443–448.
- Sullivan, T. P. and D. S. Sullivan. 1983. Use of index lines and damage assessments to estimate population densities of snowshoe hares. *Canadian Journal of Zoology* 61:163–167.
- Sullivan, T. P. and D. S. Sullivan. 1988. Influence of stand thinning on snowshoe hare population dynamics and feeding damage in lodgepole pine forest. *Journal of Applied Ecology* 25:791–805.
- Sullivan, T. P., D. S. Sullivan, P. MF Lindgren, and D. B. Ransome. 2006. Influence of repeated fertilization on forest ecosystems: relative habitat use by snowshoe hares (*Lepus americanus*). *Canadian Journal of Forest Resources* 36:2080–2089.
- Tang, G. and B. Beckage. 2010. Protecting the distribution of forests in New England in response to climate change. *Diversity and Distributions* 16:144–158.
- Taylor, S. W. and A. L. Carroll. 2004. Disturbance, forest age, and mountain pine beetle outbreak dynamics in BC: A historical perspective. Pages 41–56 in T. L. Shore, J. E. Brooks, and J. E. Stone, editors. Mountain pine beetle symposium: challenges and solutions. Natural Resources Canada, Canadian Forest Service, Pacific Forestry Centre, Information Report BC-X-399, Victoria, British Columbia, Canada.
- Telfer, E. S. 1972. Browse selection by deer and hares. *Journal of Wildlife Management* 36:1344–1349.
- Telfer, E. S. 1974. Vertical distribution of cervid and snowshoe hare browsing. *Journal of Wildlife Management* 38:944–946.
- Terwilliger, L. A. and R. Moen. 2012. Canada lynx (*Lynx canadensis*) in Minnesota: road use and movements within home range. NRR Technical Report No. NRR/TR-2012/31 Release 1.0.
- Theobald, D. M. and T. M. Shenk. 2011. Areas of high habitat use from 1999–2010 for radio-collared Canada lynx rein-

- roduced to Colorado. Unpublished report. Colorado Parks and Wildlife. 19 pp. <http://wildlife.state.co.us/SiteCollectionDocuments/DOW/Research/Mammals/Publications/LynxHabitatUseMapReport.pdf> Accessed August 2013.
- Thibault, I. and J. P. Ouellet. 2005. Hunting behaviour of eastern coyotes in relation to vegetation cover, snow conditions, and hare distribution. *Ecoscience* 12:466–475.
- Thomas, J. A., J. G. Hallett, and M. A. O'Connell. 1997. Habitat use by snowshoe hares in managed landscapes of north-eastern Washington. Unpublished report. Washington Department of Fish and Wildlife, Olympia, Washington and USDA Forest Service, Colville, Washington, USA.
- Tumlison, R. 1987. *Felis lynx*. *Mammalian Species* 269:1–8.
- Ulizio, T. J. Squires and J. Claar. 2007. Nez Perce National Forest 2007 Lynx Surveys Final Report. Unpublished report. 5 pp.
- USDA Forest Service. 2008. Southern Rockies Lynx Amendment Final Environmental Impact Statement and Record of Decision. <http://www.fs.fed.us/r2/projects/lynx/documents/index.shtml> Accessed August 2013.
- USDA Forest Service. 2009. Preliminary assessment of environmental attributes necessary to support a viable lynx population on National Forest System Lands in Northern New Mexico for LCAS revision. Unpublished internal report, March 10, 2009. Southwestern Region, Albuquerque, NM.
- USDA Forest Service. 2010. The Okanogan-Wenatchee National Forest restoration strategy: adaptive ecosystem management to restore landscape resiliency, 2010 Final Version. Okanogan-Wenatchee National Forest, Wenatchee, Washington, USA.
- USDA Forest Service. 2011. Western bark beetle strategy: human safety, recovery and resiliency. Unpublished report. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5337222.pdf Accessed August 2013.
- U.S. Fish and Wildlife Service. 2001. Formal ten-year Biological Opinion on the effects of the CITES export program for Appendix-II Furbearer Species on the contiguous United States Distinct Population Segment of the Canada Lynx. Washington, D.C. 19 pp.
- U.S. Fish and Wildlife Service. 2005. Recovery outline: contiguous United States Distinct Population Segment of Canada lynx. U.S. Fish and Wildlife Service Region 6, Montana Field Office, Helena, Montana, USA. <http://www.fws.gov/mountain-prairie/species/mammals/lynx/final%20lynx%20RecoveryOutline9-05.pdf> Accessed August 2013.
- U.S. Fish and Wildlife Service. 2011. Environmental assessment for issuance of a 10(a)(1)(B) permit for the incidental take of the Canada lynx (*Lynx canadensis*). Maine Field Office, Orono, Maine, USA.
- U.S. Fish and Wildlife Service. 2012. Canada lynx (*Lynx canadensis*) incidental take in Minnesota. Unpublished database, Bloomington, Minnesota. Accessed September 5, 2012.
- Vahle, J. R. and D. R. Patton. 1983. Red squirrel cover requirements in Arizona mixed conifer forests. *Journal of Forestry* 81:14–15, 22.
- van Zyll de Jong, C. G. 1966. Food habits of the lynx in Alberta and the Mackenzie District, Northwest Territories. *Canadian Field-Naturalist* 80:18–23.
- Vashon, J., S. McLellan, S. Crowley, A. Meehan, and K. Laustsen. 2012. Canada lynx assessment. Maine Department of Inland Fish and Wildlife, Research and Assessment Section, Bangor, ME.
- Vashon, J. H., A. L. Meehan, W. J. Jakubas, J. F. Organ, A. D. Vashon, C. R. McLaughlin, G. J. Matula, Jr., and S. M. Crowley. 2008a. Spatial ecology of a Canada lynx population in northern Maine. *Journal of Wildlife Management* 72:1479–1487.
- Vashon, J. H., A. L. Meehan, J. F. Organ, W. J. Jakubas, C. R. McLaughlin, A. D. Vashon, and S. M. Crowley. 2008b. Diurnal habitat relationships of Canada lynx in an intensively managed private forest landscape in northern Maine. *Journal of Wildlife Management* 72:1488–1496.
- Veblen, T. T., K. S. Hadley, E. M. Nel, T. Kitzberger, M. Reed, and R. Villalba. 1998. Disturbance regimes and disturbance interactions in a Rocky Mountain subalpine forest. *Journal of Ecology* 82:125–135.
- von Kienast, J.A. 2003. Winter habitat selection and food habits of lynx on the Okanogan Plateau, Washington. Thesis, University of Washington, Seattle, Washington, USA.

- Walker, C. J. 2005. Influences of landscape structure on snowshoe hare populations in fragmented forests. Thesis, University of Montana, Missoula, Montana, USA.
- Walker, E. P. 1968. Mammals of the world. 2 vols. Johns Hopkins University Press, 2nd edition. Baltimore, Maryland, USA.
- Walski, T. W. and W. W. Mautz. 1977. Nutritional evaluation of three winter browse species of snowshoe hares. *Journal of Wildlife Management* 41:144–147.
- Ward, R. P. M. and C. J. Krebs. 1985. Behavioural responses of lynx to declining snowshoe hare abundance. *Canadian Journal of Zoology* 63:2817–2824.
- Westerling A. L., H. G. Hidalgo, D. R. Cayan, T.W. Swetnam. 2006. Warming and earlier spring increase western U.S. wildfire activity. *Science* 313: 940–943.
- Whitlock, C. 2004. Land management: forests, fires, and climate. *Nature*. 432:28–29.
- Wild, M.A., T.M. Shenk, and T.R. Spraker. 2006. Plague as a mortality factor in Canada lynx (*Lynx canadensis*) reintroduced to Colorado. *Journal of Wildlife Diseases*. 42:646–650.
- Williams, A. B. 1936. The composition and dynamics of a beech-maple climax community. *Ecological Monographs* 6:317–408.
- Williams, C. K. and T. R. Lillybridge. 1983. Forested plant associations of the Okanogan National Forest. USDA, Forest Service, Pacific Northwest Region. R6-Ecol-132b-1983, Portland, Oregon, USA.
- Williams, C. K., Kelley, B. F., Smith, B. G., and T. R. Lillybridge. 1995. Forested plant associations of the Colville National Forest. USDA Forest Service, Pacific Northwest Research Station, General Technical Report, PNW-GTR-360, Portland, Oregon, USA.
- Windberg, L. A. and L. B. Keith. 1976. Experimental analyses of dispersal in snowshoe hare populations. *Canadian Journal of Zoology* 54:2061–2081.
- Wirsing, A.J. and D.L. Murray. 2002. Patterns in consumption of woody plants by snowshoe hares in the northwestern United States. *Ecoscience* 9:440–449.
- Wirsing, A. J., T. D. Steury, and D. L. Murray. 2002. A demographic analysis of a southern snowshoe hare population in a fragmented habitat: evaluating the refugium model. *Canadian Journal of Zoology* 80:169–177.
- Wolff, J. O. 1978. Food habits of snowshoe hares in interior Alaska. *Journal of Wildlife Management* 42:148–153.
- Wolff, J. O. 1980. The role of habitat patchiness in the population dynamics of snowshoe hares. *Ecological Monographs* 50:111–130.
- Wolff, J.O. 1981. Refugia, dispersal, predation and geographic variation in snowshoe hare cycles. in K. Meyers and C.D. MacInnes, editors. *Proceedings of the International Lagomorph Conference*, Guelph, Ontario, Canada.
- Wolfe, M. L., N. V. Debyle, C. S. Winchell, and T. R. McCabe. 1982. Snowshoe hare cover relationships in northern Utah. *Journal of Wildlife Management* 46:662–670.
- Wrigley, R. E. 1969. Ecological notes on the mammals of southern Quebec. *Canadian Field-Naturalist* 83:201–211.
- Yahner, R. H. 1980. Burrow system use by red squirrels. *American Midland Naturalist* 103:409–411.
- Zahratka, J. L. 2004. The population and habitat ecology of snowshoe hares (*Lepus americanus*) in the southern Rocky Mountains. Thesis, University of Wyoming, Laramie, Wyoming, USA.
- Zahratka, J. L. and T. M. Shenk. 2008. Population estimates of snowshoe hares in the Southern Rocky Mountains. *Journal of Wildlife Management* 72:906–912.
- Zimmer, J. P. 2004. Winter habitat use and diet of snowshoe hares in the Gardiner, Montana area. Thesis, Montana State University. Bozeman, Montana, USA.
- Zimmer, J. P., D. B. Tyers, and L. R. Irby. 2008. Winter snowshoe hare habitat use within a silviculturally impacted area. *Intermountain Journal of Sciences* 14:40–50.
- Zirul, D. L. 1970. Ecology of a northern population of the red squirrel *Tamiasciurus hudsonicus preblei* (Howell). Thesis, University of Alberta, Edmonton, Canada.

Glossary

- Boreal forest** – Homogeneous arboreal stands, dominated by conifers during later stages of succession, and by arboreal members of the birch and willow families in early succession (Agee 2000). The arctic tundra defines the northern border of boreal forest, but the southern border is less clear. Here we use the term boreal forest to include the transition into subalpine forests in the western part of the continent, mixed-coniferous-deciduous forests in the mid-continent, and mixed-coniferous and deciduous temperate forests of the Acadian forest region in the northeastern part of the continent.
- Canopy cover** (canopy closure) – The percentage of ground surface that is shaded by the live foliage of plants as seen from above. This measurement or estimate is used to describe how open or dense a stand of trees is.
- Carr** – Deciduous woodland or shrubland occurring on permanently wet, organic soil.
- Clearcut** – A regeneration tree harvest method that cuts and removes all merchantable trees in a single step, except for certain trees or snags retained for wildlife use.
- Coarse woody debris** – Any piece(s) of dead woody material, e.g., dead boles, limbs, and large root masses on the ground or in streams.
- Competition** – An interaction that occurs when 2 or more individuals make demands of the same resources that are in short supply. Exploitation competition occurs when 1 species uses common resources in a manner that reduces the fitness of the other species, for example by causing starvation or reduced reproductive success. Interference competition occurs when 1 species, almost invariably the species with larger body size, acts aggressively toward another, denying it access to a resource.
- Composition (of forest vegetation)** – The proportion of each tree species in a stand, expressed as a percentage of the total number, basal area, or volume of all tree species in the stand.
- Conservation measures** – Recommendations to alleviate or reduce the adverse effects of anthropogenic influences on lynx or lynx habitat.
- Core area** – Areas with the strongest long-term evidence of the persistence of lynx populations over time within the contiguous United States, as identified in the Canada Lynx Recovery Outline.
- Cover type** – The present vegetation composition of an area, described by the dominant plant species.
- Crepuscular** – Active during the twilight hours of early morning or early evening.
- Critical habitat** – Specific areas legally designated by the Secretary of the Interior within the area occupied by Canada lynx at the time they were listed under the Endangered Species Act that contain the physical or biological features that are essential to the conservation of the species and may require special management considerations or protection.
- Cumulative effects** – Effects on lynx or lynx habitat that result from the incremental impact of the proposed action when added to other past, present, and/or reasonably foreseeable future actions. Cumulative effects can be significant even when direct and indirect effects are minor.
- Denning habitat** – The environment lynx use when giving birth and rearing kittens until they are mobile. The most common component is large amounts of coarse woody debris to provide escape and thermal cover for kittens. Denning habitat may occur within mature and old growth forests, young regenerating forests, or areas where down trees are jack-strawed. Denning habitat must be located within daily travel distance of an adult female lynx (typical distance is 5-10 km [3-6 mi]) to snowshoe hare habitat.
- Depauperate** – Lacking in numbers, biomass or diversity of species.

- Designated over-the-snow routes and designated snowmobile play areas** – Areas managed under permit or agreement or by the agency, where use is encouraged, either by on-the-ground marking or by publication in brochures, recreation opportunity guides or maps (other than travel maps), or in electronic media produced or approved by the agency. The routes identified in outfitter and guide permits are designated by definition; groomed routes also are designated by definition. This definition does not apply to permitted ski areas.
- Developed recreation** – Recreational activities requiring facilities that result in concentrated use. For example, skiing requires lifts, parking lots, buildings, and roads; campgrounds require roads, picnic tables, and toilet facilities.
- Dispersal** – Movement of an individual away from its parent or an existing population to establish a home range.
- Disturbance** – Events that alter the structure, composition, or function of terrestrial or aquatic habitats. Natural disturbances include drought, floods, wind, fires, wildlife grazing, and insects and pathogens. Human-caused disturbances include actions such as timber harvest, livestock grazing, road construction, and the introduction of exotic species.
- Ecological processes** – The flow and cycling of energy, materials, and organisms through an ecosystem.
- Ecological restoration** – Management practices to reestablish sustainable and resilient vegetation communities.
- Endangered Species Act** – A law passed in 1973, and subsequently amended, for the purposes of conserving the ecosystems upon which endangered species and threatened species depend, and providing a program for the conservation of such species.
- Facultative predator** – Capable of exploiting more than one type of prey by changing its behavior.
- Fire suppression** – Any act taken to slow, stop, or extinguish a fire.
- Fire regime** – A characterization of the combination of fire frequency and fire severity under which plant communities evolved and were maintained.
- Foraging habitat (for lynx)** – Habitat that supports the primary prey (snowshoe hare) of lynx and has the vegetation structure suitable for lynx to capture prey. These conditions may occur in early successional stands following some type of disturbance, or in older forests with a substantial understory of shrubs and young conifer trees. Coarse woody debris, especially in early successional stages (created by harvest regeneration units and large fires), provides important cover for snowshoe hares and other prey.
- Forb** – A broad-leaved, herbaceous plant other than grasses, sedges, and rushes.
- Forest and backcountry roads** – Roads that are generally not paved with vehicle speeds typically less than 35 miles per hour. The surface can be gravel or natural materials.
- Forest cover type** – A description of the composition and structure of an area, focusing primarily on the dominant overstory tree species.
- Four-season resort** – Recreational facility on national forest land, permitted to operate during more than one season of the year. Resorts with either a winter or summer emphasis may be authorized to allow facilities to remain open to allow additional recreation use during other seasons.
- Fragmentation (of habitat)** – Human-caused alterations of natural landscape patterns that result in a reduction of the total area of habitat, increased isolation of habitat patches, and impaired ability of wildlife to effectively move between those patches of habitat. Depending on the cause, fragmentation of habitat may be temporary or permanent.
- Fuels treatment** – A type of vegetation management that reduces the threat of ignition, fire intensity, or rate of

spread, and is used to restore fire-adapted ecosystems.

Geographic Area (for lynx) – A broad area that contains ecological conditions that may support lynx and snowshoe hares. The geographic areas identified for lynx are the Northeast, Great Lakes, Northern Rocky Mountains, Southern Rocky Mountains, and Cascade Mountains, which have uniquely different forest ecosystems, management histories, and current lynx population status.

Habitat – The complete suite of biotic and abiotic components of the environment where an animal lives.

Habitat connectivity (for lynx) – Vegetation cover in sufficient quantity and arrangement to facilitate lynx movements. Connectivity may be affected by human developments.

Highway – All roads that are part of the National Highway System (23 CFR 470.107(b)).

Historical range of variability – The condition of vegetation at some reference point in the past.

Home range – The area used by an individual, either during the entire calendar year or seasonally, in its normal activities of foraging, mating, and rearing of young. Female home ranges typically do not overlap, but female offspring may establish a home range in part of her mother's.

Horizontal cover – The visual obscurity provided by vegetation that extends to the ground or snow surface, primarily provided by tree stems and tree boughs, but may also be provided by shrubs, herbaceous vegetation, and landscape topography.

Incidental trapping or snaring – Capture of non-target species. Lynx are susceptible to being captured in traps or snares intended for other species such as wolverine, coyote, fox, fisher, American marten, bobcat, and wolf.

Infrastructure – Facilities, utilities, and transportation systems required to meet public and administrative needs.

Irruption – A drastic and rapid increase in the density of a population.

Landscape – A specific geographic area with characteristic traits, patterns, and structure, including its biological composition, its physical environment, and its anthropogenic or social patterns.

Linkage areas – Areas that facilitate movements of lynx beyond their home range, such as dispersal, breeding season movements or exploratory movements. Linkage areas may incorporate topographic features that tend to funnel animal movements and may encompass areas of non-lynx habitat.

Long bed – A site where a lynx lays in the snow for an extended period, characterized by having an iced surface. May also be referred to as a long-duration bed.

Lynx Analysis Unit (LAU) – Landscape units that approximate the size of a female lynx annual home range (appropriate to the Geographic Area) and encompass all seasonal habitats. These may also contain areas of non-lynx habitat, such as open meadows, especially in mountainous regions. An LAU is a unit for which the effects of a project would be analyzed; its boundaries should remain constant.

Lynx habitat – Boreal forest with gentle rolling topography, dense horizontal cover, deep snow, and moderate to high (>0.5 hares/ha [0.2 hares/ac]) snowshoe hare densities. In the northeastern United States, lynx habitat includes coniferous and mixed-coniferous/deciduous forests dominated by white, black, and red spruce, balsam fir, pine, northern white cedar, hemlock, sugar maple, aspen, and paper birch. In Minnesota, lynx habitat includes coniferous and mixed-coniferous/deciduous vegetation types dominated by pine, balsam fir, black and white spruce, northern white cedar, tamarack, aspen, and paper birch. In the western United States, forest cover types dominated by Engelmann spruce, subalpine fir and lodgepole pine provide habitat for lynx.

Lynx habitat in suitable condition – Areas within the boreal forest providing lynx habitat in all seasons. Forest

stands may be in various ages or structural stages (i.e., young saplings in stand initiation structural stage, pole-size stands in stem exclusion structural stage, mature multi-story forest) provided that, following a stand-replacing disturbance or treatment that reduced the dense horizontal cover required by snowshoe hares, trees have grown tall enough and dense enough to protrude above the snow and provide food and cover for snowshoe hares and lynx in winter.

Lynx habitat currently in unsuitable condition – Areas within the boreal forest that are in the early stand initiation stage (typically less 30 years old) or have been silviculturally treated to remove cover, in which the vegetation has not developed sufficiently to support snowshoe hare populations during all seasons. Stand-replacing fire, insect epidemics or wind events can create stand initiation structural stage. Vegetation management projects that may create unsuitable conditions for a period of time include clearcuts, seed tree harvest, precommercial thinning, or understory removal.

Matrix – Matrix (e.g., hardwood forest, dry forest, non-forest) occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel through matrix while accessing patches of boreal forest within a home range.

Mature multi-story forest – A structural stage characterized by understory reinitiation, resulting in several age classes and vegetation layers. Fallen trees may be present, creating gaps in the overstory canopy. In lynx habitat, these stands typically have high horizontal cover from young understory trees and lower limbs of mature trees that reach the ground or snow level.

Mid-seral stage – A successional stage in a plant community that is the midpoint in the progression from bare ground to climax. In riparian areas, willows or other shrubs have become established and have grown to protrude above the snow.

Monitoring – Systematic sampling, testing or collection of information on a regular or ongoing basis.

Mosaic – A dynamic, heterogeneous pattern of vegetation and other habitat elements within a given area, such as a LAU.

Patch – An area of uniform vegetation that differs from what surrounds it in structure and composition.

Peripheral areas – Areas where the majority of historical lynx records are sporadic and generally correspond to periods following cyclic lynx population highs in Canada. There is no evidence of long-term presence or reproduction that might indicate colonization or sustained use of these areas by lynx.

Plant succession – A relatively predictable process by which a series of different plant communities, and their associated animals and microbes, successively occupy and replace each other over time in a particular ecosystem or landscape location following a disturbance event.

Potential vegetation type – The community of plants that would become established if all successional sequences were completed, without interference by humans, under existing environmental conditions at the site including soils, topography, and climate. Potential vegetation types are typically named by using one or more species from the dominant (overstory) vegetation layer and one or more indicator plants from the subordinate (undergrowth) layer (e.g., subalpine fir/grouse huckleberry or ABLA/VASC).

Precommercial thinning – A management technique that does not yield trees of commercial value, usually designed to reduce stem density to promote the growth of the more desirable trees.

Recovery outline – An interim strategy to guide recovery efforts and inform the critical habitat designation process until a draft recovery plan has been completed. Recovery outlines are intended primarily for internal FWS use.

Red squirrel habitat – Coniferous forests of seed and cone-producing age that usually contain snags and downed woody debris, generally mature or older forests.

- Regeneration harvest** – The cutting of trees and creating an entire new age class; an even-age harvest. The major methods are clearcutting, seed tree, shelterwood, and group selection cuts.
- Riparian area** – Area with distinctive soil and vegetation between a stream or other body of water and the adjacent upland; includes wetlands and those portions of floodplains and valley bottoms that support riparian vegetation.
- Salvage harvest** – Removal of dead trees or trees being damaged or dying due to injurious agents other than competition, in order to recover value that would otherwise be lost. Collecting firewood for personal use is not considered salvage harvest.
- Secondary areas** – Areas with historical records of lynx presence but with no record of reproduction; or areas with historical records and no recent surveys to document the presence of lynx or reproduction.
- Self-sustaining population** – A population that remains viable without human intervention.
- Sinuosity** – A statistical measurement of movement paths that are curved or crooked.
- Ski area** – A site and attendant facilities expressly developed to accommodate alpine or Nordic skiing. Operation of Nordic and alpine ski areas for up to 40 years and encompassing such acreage as the Forest Officer determines sufficient and appropriate is authorized by the National Ski Area Permit Act of 1986.
- Skid trail** – A linear feature in a forest environment resulting from removing cut trees/logs from the site of cutting to a gathering site.
- Snow compaction** – Human activities, such as travel on designated snowmobile routes, that compress the snow and reduce its penetrability.
- Snow cover** – The area of land that is covered by snow at any given time.
- Snow pack** – The thickness of snow that accumulates on the ground.
- Snow penetrability** – A measure of the resistance of the snow column to compression.
- Snowshoe hare habitat** – Boreal and upper montane forests in North America with cold, moderately deep winter snowpack and dense horizontal cover in the understory. During the winter, hares are restricted to areas where young trees or shrubs grow densely (thousands of woody stems per ha) and are tall enough to protrude above the snow during winter, or where numerous overhanging boughs of mature conifer trees touch the snow surface provide cover and browse. Winter snowshoe hare habitat develops primarily in the later phase (15 to 40 years post-disturbance) of stand initiation structural stage and in multi-story mature and old stands.
- Specialist** – A species that can only thrive in a narrow range of environmental conditions or has a limited diet. The lynx is a specialist predator of snowshoe hare.
- Stand** – A group of trees or other vegetation occupying a specific area and sufficiently uniform in composition, age, spatial arrangement, and conditions as to be distinguishable from the vegetation on adjoining lands.
- Stand initiation structural stage** – Following a stand-replacing disturbance or regeneration timber harvest, a new single-story layer of shrubs, tree seedlings, and saplings establish and develop, reoccupying the site. Trees that need full sun are likely to dominate these even-aged stands. [In the years immediately following the disturbance, tree seedlings are too small to provide food and cover for snowshoe hares and lynx, particularly during the winter (see also the definition for *lynx habitat currently in unsuitable condition*). As time progresses, the trees grow tall and dense enough to provide food and cover for snowshoe hares and lynx during all seasons (see also the definition for *lynx habitat in suitable condition*).]
- Stand-replacing fire** – A fire that kills aboveground parts of the dominant vegetation. Approximately 80 percent or

more of the aboveground dominant vegetation is either consumed or dies as a result of fire.

Stem exclusion structural stage – A phase of forest development following the typically rapid establishment of an initial cohort of trees, during which new establishment is precluded and competition occurs within the existing cohort for light, nutrients and space.

Structure (of forest vegetation) – The horizontal and vertical distribution of plants in a stand, including height, diameter, crown layers, and stems of trees, shrubs, herbaceous understory, snags, and coarse woody debris.

Structural stage – A recognizable condition in forest stand development describing the physical size and arrangement (both vertical and horizontal) of trees occupying the site.

Subnivean habitat – Habitat that is under the snow surface.

Topographic relief – The difference in elevation in a landscape from the lowest point to the highest point. Lynx habitat typically has low topographic relief, described by Squires et al. (2013) as low surface roughness and by Maletzke et al. (2008) as $<30^\circ$ slopes.

Understory re-initiation structural stage – Establishment of a new age class of trees after overstory trees begin to die, are removed, or no longer fully occupy their growing space. The stand of trees begins to stratify into vertical layers, with some small shade-tolerant trees in the understory.

Wildland urban interface (WUI) – Defined in the Healthy Forests Restoration Act. Basically, the wildland urban interface is the area adjacent to an at-risk community that is identified in the community wildfire protection plan. If there is no community wildfire protection plan in place, the WUI is the area 0.5 mile from the boundary of an at-risk community; or within 1.5 miles of the boundary of an at-risk community if the terrain is steep, or there is a nearby road or ridgetop that could be incorporated into a fuel break, or the land is in condition class 3, or the area contains an emergency exit route needed for safe evacuations. (Condensed from HFRA. For full text see HFRA § 101.)

APPENDIX A

List of National Forests

Table 1. National Forests included in the NRLA area with Land and Resource Management Plans being amended and considered in this consultation, identified as being core, secondary or peripheral areas and whether occupied by lynx or not (U.S. Forest Service in litt. 2007)

| National Forest | Core (C), Secondary (S), Peripheral (P) | Acres | Acres of Lynx Habitat | % of National Forest that is Lynx Habitat |
|---------------------------------|---|-------------------|--------------------------|---|
| Occupied Lynx Habitat | | | | |
| Bridger-Teton NF | C | 3,437,527 | 2,000,000 | 58.2% |
| Clearwater NF | S | 1,825,397 | 930,000 | 50.9% |
| Custer NF | C & S | 1,187,621 | 230,000 | 19.4% |
| Flathead NF | C | 2,355,592 | 1,730,000 | 73.4% |
| Gallatin NF | C & S | 1,806,565 | 870,000 | 48.2% |
| Helena NF ¹ | C, S & P | 975,387 | 440,000 | 45.1% |
| Idaho Panhandle NF ² | C & S | 2,498,234 | 1,170,000 | 46.8% |
| Kootenai NF | C | 2,242,468 | 1,010,000 | 45.0% |
| Lewis & Clark NF ¹ | C, S & P | 1,862,289 | 970,000 | 52.1% |
| Lolo NF | C | 2,082,784 | 1,110,000 | 53.3% |
| Shoshone NF | C | 2,436,850 | 640,000 | 26.3% |
| Targhee NF | C & S | 1,810,854 | 1,050,000 | 58.0% |
| Total | | 24,521,568 | 12,150,000 | 48.06% |
| Unoccupied Lynx Habitat | | | | |
| Ashley NF | P | 1,384,136 | 700,000 | 50.6% |
| Beaverhead-Deerlodge NF | S | 3,360,825 | 2,060,000 | 61.3% |
| Bighorn NF | P | 1,107,671 | 310,000 | 28.0% |
| Bitterroot NF | S | 1,580,948 | 640,000 | 40.5% |
| Salmon-Challis NF | S | 4,350,827 | 1,800,000 | 41.4% |
| Nez Perce NF | S | 2,224,230 | 810,000 | 36.4% |
| Total | | 14,008,637 | 6,320,000 | 43.03% |

¹ Isolated mountain ranges are designated as peripheral habitat and are not subject to management direction outlined in the Northern Rockies Lynx Amendment (NRLA).

² Only the NE corner of the Idaho Panhandle NF is identified as core habitat.

APPENDIX B

APPENDIX C

Alternative F – proposed action in occupied lynx habitat (excerpted from U.S. Forest Service 2007)

Notes: (1) Both *beneficial* and *detrimental* effects to all species except lynx are believed to be minimal due to the potentially small amount of acreage affected in relation to the entire NRLA area.

(2) For those areas identified as **occupied** lynx habitat in the *Occupied Mapped Lynx Habitat Amendment to the Canada Lynx Conservation Agreement* (USDA Forest Service et al. 2006), management direction would be the objectives, standards, guidelines and monitoring identified under Alternative F in Appendix E. Areas identified as **unoccupied** lynx habitat would not have any specific management direction for lynx until such time as those areas are occupied. See section II.F. for more details.

| NRLA Baseline - Alternative B | NRLA Alternative F | Rationale for Change |
|---|--|--|
| <p><u>Goal</u>¹⁴ Conserve Canada lynx.</p> | Same as Alt B | No change. |
| <p>ALL MANAGEMENT PRACTICES AND ACTIVITIES (ALL). <i>The following objectives, standards and guidelines apply to management projects in lynx habitat in lynx analysis units (LAU) and in linkage areas, subject to valid existing rights. They do not apply to wildfire suppression, or to wildland fire use</i></p> | | |
| <p><u>Objective</u>³⁰ ALL O1 Maintain²⁶ or restore³⁹ lynx habitat²³ connectivity¹⁶ in and between LAUs²¹, and in linkage areas²².</p> | Same as Alt B | No change. |
| <p><u>Standard</u>⁴³ ALL S1 New or expanded permanent developments³³ and vegetation management projects⁴⁸ must maintain²⁶ habitat connectivity¹⁶.</p> | <p><u>Standard</u>⁴³ ALL S1 New or expanded permanent developments³³ and vegetation management projects⁴⁸ must maintain²⁶ habitat connectivity¹⁶ in an LAU²¹ and/or linkage area²².</p> | |
| <p><u>Guideline</u>¹⁵ ALL G1 Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways¹⁸ or forest highways¹² across federal land. Methods could include fencing, underpasses or overpasses.</p> | Same as Alt B | No change. |
| <p><u>Standard</u>⁴³ LAU S1 LAU²¹ boundaries will not be adjusted except through agreement with the FWS, based on new information about lynx habitat²³.</p> | <p><u>Standard</u>⁴³ LAU S1 <i>Changes in LAU²¹ boundaries shall be based on site-specific habitat information and after review by the Forest Service Regional Office.</i></p> | Clarified standard and added a higher level review to provide for consistency. |
| <p>VEGETATION MANAGEMENT PROJETS (VEG): <i>The following objectives, standards and guidelines apply to vegetation management projects in lynx habitat in lynx analysis units (LAU). With the exception of Objective VEG O3 that specifically concerns wildland fire use, the objectives, standards and guidelines do not apply to wildfire suppression, wildland fire use, or removal of vegetation for permanent developments like mineral operations, ski runs, roads and the like. None of the objectives, standards, or guidelines apply to linkage areas.</i></p> | | |
| <p><u>Objective</u>³⁰ VEG O1 Manage vegetation to be more similar to historic succession and disturbance processes while maintaining habitat components necessary for the</p> | <p><u>Objective</u>³⁰ VEG O1 Manage vegetation⁴⁸ to <i>mimic or approximate natural</i> succession and disturbance processes while maintaining habitat components necessary for the</p> | Clarified language. |

| NRLA Baseline - Alternative B | NRLA Alternative F | Rationale for Change |
|---|--|---|
| conservation of lynx. | conservation of lynx. | |
| <u>Objective VEG O2</u> Maintain or improve lynx habitat ²³ , emphasizing high-quality winter snowshoe hare habitat ⁵⁰ near denning habitat ⁶ . | <u>Objective VEG O2</u> Provide a mosaic of habitat conditions through time that support dense horizontal cover ¹⁹ , and high densities of snowshoe hare. Provide winter snowshoe hare habitat ⁵⁰ in both the stand initiation structural stage and in mature, multi-story conifer vegetation. | Changed to more specific language which provides needed detail to aid project planning. |
| <u>Objective VEG O3</u> Conduct fire use ¹¹ activities to restore ³⁹ ecological processes and maintain or improve lynx habitat. | Same as Alt B | No change. |
| <u>Objective VEG O4</u> Design regeneration harvest, reforestation, and thinning to develop characteristics suitable for winter snowshoe hare habitat. | <u>Objective VEG O4</u> <i>Focus vegetation management⁴⁸ in areas that have potential to improve winter snowshoe hare habitat⁵⁰ but presently have poorly developed understories that lack dense horizontal cover.</i> | Changed to more specific language which provides needed detail to aid project planning. |
| <u>Standard⁴³ VEG S1</u> Unless a broad scale assessment ² has been completed that substantiates different historic levels of unsuitable habitat ²⁴ , limit disturbance in each LAU ²¹ as follows: If more than 30 percent of the lynx habitat ²³ in an LAU is currently in unsuitable condition, no additional habitat may be made unsuitable by vegetation management projects ⁴⁸ . | <u>Standard⁴³ VEG S1</u> Standard VEG S1 applies to all vegetation management ⁴⁸ projects that regenerate ³⁷ timber, except for fuel treatment ¹³ projects within the wildland urban interface (WUI) as defined by HFRA, subject to the following limitation: Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 may occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). For fuel treatment projects within the WUI see guideline VEG G10. The Standard: Unless a broad scale assessment has been completed that substantiates different historic levels of stand initiation structural stages ⁴⁴ limit disturbance in each LAU as follows: If more than 30 percent of the lynx habitat in an LAU is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects. | Changed to provide some flexibility for fuels reduction projects. |
| <u>Standard VEG S2</u> | <u>Standard VEG S2</u> | Changed to provide some flexibility for fuels reduction |

| NRLA Baseline - Alternative B | NRLA Alternative F | Rationale for Change |
|---|---|---|
| <p>Timber management projects⁴⁶ shall not change more than 15 percent of the lynx habitat on NFS lands in an LAU to an unsuitable condition in a ten-year period.</p> | <p>Standard VEG S2 applies to all vegetation management⁴⁸ projects that regenerate³⁷ timber, except for fuel treatment¹³ projects within the wildland urban interface (WUI) as defined by HFRA, subject to the following limitation:</p> <p>Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 may occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest).</p> <p>For fuel treatment projects within the WUI see guideline VEG G10.</p> <p>The Standard: Timber management projects shall not regenerate³⁷ more than 15 percent of lynx habitat on NFS lands in an LAU in a ten-year period.</p> | <p>projects.</p> |
| <p><u>Standard VEG S3</u> Maintain²⁶ at least ten percent of the lynx habitat in an LAU as denning habitat⁶ in patches generally larger than five acres.</p> <p>Where less than ten percent denning habitat is present in an LAU, defer vegetation management projects in stands that have the highest potential to develop denning habitat.</p> | <p><u>Guideline VEG G11</u> <i>Denning habitat⁶ should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads, or large piles of small wind thrown trees ("jack-strawed" piles). If denning habitat appears to be lacking in the LAU, then projects should be designed to retain some coarse woody debris⁴, piles, or residual trees to provide denning habitat⁶ in the future.</i></p> | <p>Changed because the current consensus by lynx researchers is that denning habitat, in most cases, is not limiting.</p> |
| <p><u>Standard VEG S4</u> After a disturbance kills trees in areas five acres or smaller that could contribute to lynx denning habitat, salvage harvest⁴¹ may occur only in:</p> <ol style="list-style-type: none"> 1) Developed recreation⁹ sites, administrative sites, or authorized special use structures or improvements; or 2) Designated road or trail corridors where public safety or access has been or may be compromised; or 3) LAUs where denning habitat has been mapped and field-validated, provided at least ten percent is retained and well distributed. | <p><i>This number is not included in Alt F. This item is included as part of Guideline VEG G11).</i></p> | <p>Changed because the current consensus by lynx researchers is that denning habitat, in most cases, is not limiting.</p> |
| <p><u>Standard VEG S5</u> Precommercial thinning³⁵ projects that reduce winter</p> | <p><u>Standard VEG S5</u> Standard VEG S5 applies to all precommercial</p> | <p>Changed to provide some flexibility for fuels reduction projects.</p> |

| NRLA Baseline - Alternative B | NRLA Alternative F | Rationale for Change |
|--|--|----------------------|
| <p>snowshoe hare habitat⁵⁰ during the stand initiation structural stage⁴⁴ may occur only:</p> <p>1) Within 200 feet of administrative sites, dwellings or outbuildings.</p> <p>NOTE: Some thinning projects, such as white pine pruning or Christmas tree harvest, may occur if winter snowshoe hare habitat is not reduced.</p> | <p>thinning³⁵ projects, except for fuel treatment¹³ projects that use precommercial thinning as a tool within the wildland urban interface (WUI) as defined by HFRA, subject to the following limitation:</p> <p>Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 may occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest).</p> <p>For fuel treatment projects within the WUI see guideline VEG G10.</p> <p>The Standard: Precommercial thinning projects that reduce snowshoe hare habitat, may occur from the stand initiation structural stage⁴⁴ until the stands no longer provide winter snowshoe hare habitat only:</p> <ol style="list-style-type: none"> 1. Within 200 feet of administrative sites, dwellings, or outbuildings; or 2. For research studies³⁸ or genetic tree tests evaluating genetically improved reforestation stock; or 3. Based on new information that is peer reviewed and accepted by the regional levels of the Forest Service and FWS, where a written determination states: <ol style="list-style-type: none"> a. that a project is not likely to adversely affect lynx; or b. that a project is likely to have short term adverse effects on lynx or its habitat, but would result in long-term benefits to lynx and its habitat; or 4. For conifer removal in aspen, or daylight thinning⁵ around individual aspen trees, where aspen is in decline; or 5. For daylight thinning of planted rust- | |

| NRLA Baseline - Alternative B | NRLA Alternative F | Rationale for Change |
|-------------------------------|--|----------------------|
| | <p>resistant white pine where 80 % of the winter snowshoe hare habitat⁵⁰ is retained; or</p> <p>6. To restore whitebark pine.</p> | |

| NRLA Baseline - Alternative B | NRLA Alternative F | Rationale for Change |
|---|---|--|
| <p align="center"><u>Standard VEG S6</u></p> <p>Precommercial thinning projects that reduce winter snowshoe hare habitat during the understory-reinitiation⁴⁷ or old-multistory structural stages³¹ may occur only:</p> <p>1) Within 200 feet of administrative sites, dwellings or outbuildings.</p> | <p><u>Standard VEG S6</u></p> <p>Standard VEG S6 applies to all vegetation management⁴⁸ projects that regenerate³⁷ timber, except for fuel treatment¹³ projects within the wildland urban interface (WUI) as defined by HFRA, subject to the following limitation:</p> <p>Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 may occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest).</p> <p>For fuel treatment projects within the WUI see guideline VEG G10.</p> <p>The Standard: Vegetation management projects that reduce snowshoe hare habitat in multi-story mature or late successional forests²⁹ may occur only:</p> <ol style="list-style-type: none"> 1. Within 200 feet of administrative sites, dwellings, outbuildings, recreation sites, and special use permit improvements, including infrastructure within permitted ski area boundaries; or 2. For research studies³⁸ or genetic tree tests evaluating genetically improved reforestation stock; or 3. For incidental removal during salvage harvest⁴¹ (e.g. removal due to location of skid trails). <p>(NOTE: Timber harvest is allowed in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover [e.g. uneven age management systems could be used to create openings where there is little understory so that new forage can grow]).</p> | <p>Changed to provide some flexibility for fuels reduction projects and to provide for limited flexibility in situations where the standard is not operationally practical to implement.</p> |
| <p align="center"><u>Guideline¹⁵ VEG G1</u></p> <p>Vegetation management projects⁴⁷ should be planned to recruit a high density of conifers, hardwoods and shrubs where such habitat is scarce or not available.</p> | <p><u>Guideline VEG G1</u></p> <p>Vegetation management⁴⁸ projects should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available.</p> | <p>Changed to more specific language which provides needed detail to aid project planning.</p> |

| NRLA Baseline - Alternative B | NRLA Alternative F | Rationale for Change |
|--|--|---|
| <p>Winter snowshoe hare habitat⁵⁰ should be near denning habitat⁶.</p> <p>Vegetation management projects should be planned to extend the production of winter snowshoe hare habitat when forage quality and quantity is declining.</p> | <p>Priority should be given to stem-exclusion, closed-canopy structural stage⁴⁴ <i>stands for lynx or their prey (e.g. mesic, monotypic lodgepole stands)</i>.</p> <p>Winter snowshoe hare habitat⁵⁰ should be near denning habitat⁶.</p> | |
| <p><u>Guideline VEG G2</u></p> <p>Where more denning habitat is desired, leave standing trees and coarse woody debris in amounts similar to what would be there naturally.</p> <p>Denning habitat should be near winter snowshoe hare habitat.</p> | <p><u>Guideline VEG G2</u></p> <p><i>This number is not included in Alt F. This item is included as part of Guideline VEG G11.</i></p> | <p>Changed because the current consensus by lynx researchers is that denning habitat, in most cases, is not limiting.</p> |
| <p><u>Guideline VEG G3</u></p> <p>Vegetation management projects designed to retain or restore³⁹ denning habitat should be located where there is a low probability of stand-replacing fire.</p> | <p><u>Guideline VEG G3</u></p> <p><i>This number is not included in Alt F. This item is included as part of Guideline VEG G11.</i></p> | <p>Changed because the current consensus by lynx researchers is that denning habitat, in most cases, is not limiting.</p> |
| <p><u>Guideline VEG G4</u></p> <p>Fire use¹¹ activities should not create permanent travel routes that facilitate snow compaction.</p> <p>Constructing permanent firebreaks on ridges or saddles should be avoided.</p> | <p><u>Guideline VEG G4</u></p> <p><i>Prescribed fire³⁴ activities should not create permanent travel routes that facilitate snow compaction.</i></p> <p>Constructing permanent firebreaks on ridges or saddles should be avoided.</p> | <p>Changed language to address specific issue with prescribed fire.</p> |
| <p><u>Guideline VEG G5</u></p> <p>Habitat for alternate prey species, primarily red squirrel³⁶, should be provided in each LAU.</p> | <p>Same as Alt B</p> | <p>No change.</p> |
| <p>Not included</p> | <p><u>Guideline VEG G10</u></p> <p><i>Fuel treatment projects in the WUI as defined by HFRA^{17, 48} should be designed considering standards VEG S1, S2, S5, and S6 to promote lynx conservation.</i></p> | <p>Added to provide direction to consider lynx habitat needs when planning fuel treatment projects.</p> |
| <p><u>LIVESTOCK MANAGEMENT (GRAZ):</u> <i>The following objectives and guidelines apply to grazing projects in lynx habitat in lynx analysis units (LAU). They do not apply to linkage areas.</i></p> | | |
| <p><u>Objective³⁰ GRAZ O1</u></p> <p>Manage livestock grazing to be compatible with improving or maintaining²⁶ lynx habitat²³.</p> | <p>Same as Alt B</p> | <p>No change.</p> |
| <p><u>Standard⁴³ GRAZ S1</u></p> <p>In fire- and harvest-created openings, manage livestock grazing to make sure impacts do not prevent shrubs and trees from regenerating.</p> | <p><i>This number is not included in Alt F. This item is included as Guideline GRAZ G1.</i></p> | <p>Changed to Guideline because the USFWS Remand Notice (Federal Register Vol. 69, No. 128, July 3, 2003) did not identify grazing practices as a threat to lynx.</p> |

| NRLA Baseline - Alternative B | NRLA Alternative F | Rationale for Change |
|---|---|--|
| <p><u>Standard GRAZ S2</u> In aspen stands, manage livestock grazing to contribute to their long-term health and sustainability.</p> | <p><i>This number is not included in Alt F. This item is included as Guideline GRAZ G2.</i></p> | <p>Changed to Guideline because the USFWS Remand Notice (Federal Register Vol. 69, No. 128, July 3, 2003) did not identify grazing practices as a threat to lynx.</p> |
| <p><u>Standard GRAZ S3</u> In riparian areas⁴⁰ and willow carrs³, manage livestock grazing to contribute to maintaining or achieving a preponderance of mid- or late-seral stages²⁸, similar to conditions that would have occurred under historic disturbance regimes.</p> | <p><i>This number is not included in Alt F. This item is included as Guideline GRAZ G3.</i></p> | <p>Changed to Guideline because the USFWS Remand Notice (Federal Register Vol. 69, No. 128, July 3, 2003) did not identify grazing practices as a threat to lynx.</p> |
| <p><u>Standard GRAZ S4</u> In shrub-steppe habitats⁴², manage livestock grazing in the elevation ranges of forested lynx habitat²³ in LAUs²¹, to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.</p> | <p><i>This number is not included in Alt F. This item is included as Guideline GRAZ G4.</i></p> | <p>Changed to Guideline because the USFWS Remand Notice (Federal Register Vol. 69, No. 128, July 3, 2003) did not identify grazing practices as a threat to lynx.</p> |
| <p><i>This number is not included in Alt B. This item is included as Standard GRAZ S1.</i></p> | <p><u>Guideline¹⁵ GRAZ G1</u> <i>In fire- and harvest-created openings, livestock grazing should be managed so impacts do not prevent shrubs and trees from regenerating.</i></p> | <p>Standard was changed to Guideline because the USFWS Remand Notice (Federal Register Vol. 69, No. 128, July 3, 2003) did not identify grazing practices as a threat to lynx.</p> |
| <p><i>This number is not included in Alt B. This item is included as Standard GRAZ S2.</i></p> | <p><u>Guideline GRAZ G2</u> <i>In aspen stands, livestock grazing should be managed to contribute to the long-term health and sustainability of aspen.</i></p> | <p>Standard was changed to Guideline because the USFWS Remand Notice (Federal Register Vol. 69, No. 128, July 3, 2003) did not identify grazing practices as a threat to lynx.</p> |
| <p><i>This number is not included in Alt B. This item is included as Standard GRAZ S3.</i></p> | <p><u>Guideline GRAZ G3</u> <i>In riparian areas⁴⁰ and willow carrs³, livestock grazing should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages²⁸, similar to conditions that would have occurred under historic disturbance regimes.</i></p> | <p>Standard was changed to Guideline because the USFWS Remand Notice (Federal Register Vol. 69, No. 128, July 3, 2003) did not identify grazing practices as a threat to lynx.</p> |
| <p><i>This number is not included in Alt B. This item is included as Standard GRAZ S4.</i></p> | <p><u>Guideline GRAZ G4</u> <i>In shrub-steppe habitats⁴², livestock grazing should be managed in the elevation ranges of forested lynx habitat in LAUs²¹, to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.</i></p> | <p>Standard was changed to Guideline because the USFWS Remand Notice (Federal Register Vol. 69, No. 128, July 3, 2003) did not identify grazing practices as a threat to lynx.</p> |

| NRLA Baseline - Alternative B | NRLA Alternative F | Rationale for Change |
|--|---|--|
| HUMAN USE PROJETS (HU): The following objectives and guidelines apply to <i>human use projects, such as special uses (other than grazing), recreation management, roads, highways, mineral and energy development, in lynx habitat in lynx analysis units (LAU),</i> subject to valid existing rights. <i>They do not apply to vegetation management projects or grazing projects directly. They do not apply to linkage areas.</i> | | |
| <u>Objective³⁰ HU O1</u> Maintain ²⁶ the lynx's natural competitive advantage over other predators in deep snow, by discouraging the expansion of snow-compacting activities in lynx habitat ²³ . | Same as Alt B. | No change. |
| <u>Objective HU O2</u> Manage recreational activities to maintain lynx habitat and connectivity ¹⁶ . | Same as Alt B. | No change. |
| <u>Objective HU O3</u> Concentrate activities in existing developed areas, rather than developing new areas in lynx habitat. | Same as Alt B. | No change. |
| <u>Objective HU O4</u> Provide for lynx habitat needs and connectivity when developing new or expanding existing developed recreation ⁹ sites or ski areas. | Same as Alt B. | No change. |
| <u>Objective HU O5</u> Manage human activities – such as exploring and developing minerals and oil and gas, placing utility corridors and permitting special uses – to reduce impacts on lynx and lynx habitat. | <u>Objective HU O5</u> Manage human activities, <i>such as special uses, mineral and oil and gas exploration and development, and placement of utility transmission corridors,</i> to reduce impacts on lynx and lynx habitat. | Clarified language. |
| <u>Objective HU O6</u> Reduce adverse highway ¹⁸ effects on lynx by working cooperatively with other agencies to provide for lynx movement and habitat connectivity ¹⁶ , and to reduce the potential of lynx mortality. | Same as Alt B. | No change. |
| <u>Standard⁴³ HU S1</u> Allow no net increase in designated over-the-snow routes ⁷ or play areas by LAU ²⁷ , unless designation serves to consolidate use and improve lynx habitat ²³ . This does not apply inside permitted ski area boundaries, to winter logging, to rerouting trails for public safety, to accessing private in holdings or where regulated by HU S3. | <i>This number is not included in Alt F. This item is included as Guideline HU G11.</i> | USFWS Remand Notice (Federal Register Vol. 69, No. 128, July 3, 2003) did not consider packed snowtrails to be a threat to lynx at this time. Recent published research in western Montana has provided evidence to support this contention (Kolbe 2005). Other unpublished research in Utah arrived at differing conclusions (Bunnell 2005). Both studies used different methodology. |

| NRLA Baseline - Alternative B | NRLA Alternative F | Rationale for Change |
|---|---|---|
| <p align="center"><u>Standard HU S2</u></p> <p>When developing or expanding ski areas, locate trails, access roads and lift termini to maintain²⁶ and provide lynx security habitat¹⁰ if it's been identified as a need.</p> | <p><i>This number is not included in Alt F. This item is included as Guideline HU G10.</i></p> | <p>No clear evidence to indicate this is limiting lynx use.</p> |
| <p align="center"><u>Standard HU S3</u></p> <p>Winter access for non-recreation special uses and mineral and energy exploration and development, shall be limited to designated routes⁸ or designated over-the-snow routes⁷.</p> | <p><i>This number is not included in Alt F. This item is included as Guideline HU G12.</i></p> | <p>USFWS Remand Notice (Federal Register Vol. 69, No. 128, July 3, 2003) did not consider packed snowtrails to be a threat to lynx at this time. Recent published research in western Montana has provided evidence to support this contention (Kolbe 2005). Other unpublished research in Utah arrived at differing conclusions (Bunnell 2005). Both studies used different methodology.</p> |
| <p align="center"><u>Guideline¹⁵ HU G1</u></p> <p>When developing or expanding ski areas, provisions should be made for adequately sized inter-trail islands that include coarse woody debris⁴, so winter snowshoe hare habitat⁴⁹ is maintained.</p> | <p>Same as Alt B</p> | <p>No change.</p> |
| <p align="center"><u>Guideline HU G2</u></p> <p>When developing or expanding ski areas, foraging should be provided consistent with the ski area's operational needs, especially where lynx habitat occurs as narrow bands of coniferous forest across mountain slopes.</p> | <p>Same as Alt B</p> | <p>No change.</p> |
| <p align="center"><u>Guideline HU G3</u></p> <p>Recreation developments and operations should be planned in ways that both provide for lynx movement and maintain the effective- ness of lynx habitat²³.</p> | <p>Same as Alt B</p> | <p>No change.</p> |
| <p align="center"><u>Guideline HU G4</u></p> <p>For mineral and energy development sites and facilities, remote monitoring should be encouraged to reduce snow compaction.</p> | <p>Same as Alt B</p> | <p>No change.</p> |
| <p align="center"><u>Guideline HU G5</u></p> <p>For mineral and energy development sites and facilities that are closed, a reclamation plan that restores³⁹ lynx habitat should be developed.</p> | <p>Same as Alt B</p> | <p>No change.</p> |
| <p align="center"><u>Guideline HU G6</u></p> <p>Upgrading unpaved roads to maintenance levels²⁷ 4</p> | <p><i>Methods to avoid or reduce effects to lynx should be used in lynx habitat when upgrading unpaved roads to</i></p> | <p>Clarified language.</p> |

| NRLA Baseline - Alternative B | NRLA Alternative F | Rationale for Change |
|---|--|--|
| and 5 should be avoided in lynx habitat, if the result would be increased traffic speeds and volumes, or a foreseeable contribution to increases in human activity or development. | maintenance levels 4 or 5, if the result would be increased traffic speeds and volumes, or a foreseeable contribution to increases in human activity or development. | |
| <p align="center"><u>Guideline HU G7</u></p> New permanent roads should not be built on ridge-tops and saddles, or in areas identified as important for lynx habitat connectivity ¹⁶ . New permanent roads and trails should be situated away from forested stringers. | Same as Alt B | No change. |
| <p align="center"><u>Guideline HU G8</u></p> Cutting brush along low-speed ²⁵ , low-traffic-volume roads should be done to the minimum level necessary to provide for public safety. | Same as Alt B | No change. |
| <p align="center"><u>Guideline HU G9</u></p> On new roads built for projects, public motorized use should be restricted. Effective closures should be provided in road designs. When the project is over, these roads should be reclaimed or decommissioned, if not needed for other management objectives. | Same as Alt B | No change. |
| <p align="center"><i>This number is not included in Alt B. This item is included as Standard HU S2.</i></p> | <p align="center"><u>Guideline HU G10</u></p> When developing or expanding ski areas and trails, access roads and lift termini to maintain and provide lynx security ¹⁰ habitat. | Changed from Standard to Guideline because no clear evidence to indicate this is limiting lynx use. |
| <p align="center"><i>This number is not included in Alt B. This item is included as Standard HU S1.</i></p> | <p><u>Guideline HU G11</u></p> Designated over-the-snow routes, or designated play areas, should not expand outside baseline areas of consistent snow compaction¹, unless designation serves to consolidate use and improve lynx habitat. This is calculated on an LAU basis, or on a combination of immediately adjacent LAUs. <i>This does not apply inside permitted ski area boundaries, to winter logging, to rerouting trails for public safety, to accessing private inholdings, or to access regulated by Guideline HU G12.</i> <i>Use the same analysis boundaries for all actions subject to this guideline.</i> | Changed from Standard to Guideline. USFWS Remand Notice (Federal Register Vol. 69, No. 128, July 3, 2003) did not consider packed snowtrails to be a threat to lynx at this time. Recent published research in western Montana has provided evidence to support this contention (Kolbe 2005). Other unpublished research in Utah arrived at differing conclusions (Bunnell 2005). Both studies used different methodology. |

| NRLA Baseline - Alternative B | NRLA Alternative F | Rationale for Change |
|---|--|--|
| <i>This number is not included in Alt B. This item is included as Standard HU S3.</i> | <u>Guideline HU G12</u> <i>Winter access for non-recreation special uses, and mineral and energy exploration and development, should be limited to designated routes⁸ or designated over-the-snow routes⁷.</i> | Changed from Standard to Guideline. USFWS Remand Notice (Federal Register Vol. 69, No. 128, July 3, 2003) did not consider packed snowtrails to be a threat to lynx at this time. Recent published research in western Montana has provided evidence to support this contention (Kolbe 2005). Other unpublished research in Utah arrived at differing conclusions (Bunnell 2005). Both studies used different methodology. |
| <u>LINKAGE AREAS (LINK):</u> The following objective, standard and guidelines apply to <i>all projects within linkage areas</i> , subject to valid existing rights. | | |
| <u>Objective³⁰ LINK O1</u> In areas of intermingled land ownership, work with landowners to pursue conservation easements, habitat conservation plans, land exchanges, or other solutions to reduce the potential of adverse impacts on lynx and lynx habitat. | Same as Alt B | No change. |
| <u>Standard⁴³ LINK S1</u> When highway ¹⁸ or forest highway ¹² construction or reconstruction is proposed in linkage areas ²² , identify potential highway crossings. | Same as Alt B | No change. |
| <u>Standard LINK S2</u> Manage livestock grazing in shrub- steppe habitats ⁴² to contribute to maintaining ²⁶ or achieving a preponderance of mid- or late-seral stages ²⁸ , similar to conditions that would have occurred under historic disturbance regimes. | <i>This number is not included in Alt F. This item is included as Guideline LINK G2.</i> | Standard was changed to Guideline because the USFWS Remand Notice (Federal Register Vol. 69, No. 128, July 3, 2003) did not identify grazing practices as a threat to lynx. |
| <u>Guideline¹⁵ LINK G1</u> NFS lands should be retained in public ownership. | Same as Alt B | No change. |
| <i>This number is not included in Alt B. This item is included as Standard LINK S2.</i> | <u>Guideline LINK G2</u> <i>Livestock grazing in shrub-steppe habitats⁴² should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages²⁸, similar to conditions that would have occurred under historic disturbance regimes.</i> | Standard was changed to Guideline because the USFWS Remand Notice (Federal Register Vol. 69, No. 128, July 3, 2003) did not identify grazing practices as a threat to lynx. |
| <u>REQUIRED MONITORING</u> | | |
| Map the location and amount of snow-compacting use that coincided with lynx habitat ²³ in LAUs ²¹ during the | <i>Map the location and intensity of snow compacting activities, and designated and groomed routes that occurred inside LAUs during the period of 1998 to</i> | Clarified language. |

| NRLA Baseline - Alternative B | NRLA Alternative F | Rationale for Change |
|--|--|------------------------------------|
| 1998-2000 seasons for designated over-the-snow ⁷ and groomed routes and areas, and areas of consistent snow compaction ¹ . Such activities include snowmobiling, snowshoeing, cross-country skiing, dog sledding, etc. | <i>2000. The mapping is to be completed within one year of this decision and changes in activities and routes are to be monitored every five years after the decision.</i> | |
| None | Annually report the number of acres where any of the exemptions 1 through 6 listed in Standard VEG S5 were applied. Report the type of activity, the number of acres, and the location (by unit, and LAU ²¹). | Additional monitoring item needed. |
| None | Report the acres of fuel treatment in lynx habitat within the wildland urban interface ⁴⁹ as defined by HFRA ¹⁷ when the project decision is approved. Report whether or not the fuel treatment met the vegetation standard. If standard(s) are not met, report, which standard(s) are not, met, why they were not met, and how many acres were affected. Units will report to their respective USFS Regional Office. Region 1 of the USFS will consolidate all reports. | Additional monitoring item needed. |

Glossary

¹ *Areas of consistent snow compaction* – An area of consistent snow compaction is an area of land or water that during winter is generally covered with snow and gets enough human use that individual tracks are indistinguishable. In such places, compacted snow is evident most of the time, except immediately after (within 48 hours) snowfall. These can be areas or linear routes, and are generally found in near snowmobile or cross-country ski routes, in adjacent openings, parks and meadows, near ski huts or plowed roads, or in winter parking areas. Areas of consistent snow compaction will be determined based on the area or miles used in 1998 to 2000.

² *Broad scale assessment* – A broad scale assessment is a synthesis of current scientific knowledge, including a description of uncertainties and assumptions, to provide an understanding of past and present conditions and future trends, and a characterization of the ecological, social and economic components of an area. (LCAS)

³ *Carr* – Deciduous woodland or shrub land occurring on permanently wet, organic soil. (LCAS)

⁴ *Course woody debris* – Any piece(s) of dead woody material, e.g., dead boles, limbs, and large root masses on the ground or in streams. (LCAS)

⁵ *Daylight thinning* – Daylight thinning is a form of precommercial thinning that removes the trees and brush inside a given radius around a tree.

⁶ *Denning habitat (lynx)* – Denning habitat is the environment lynx use when giving birth and rearing kittens until they are mobile. The most common component is large amounts of coarse woody debris to provide escape and thermal cover for kittens. Denning habitat must be within daily travel distance of winter snowshoe hare habitat – the typical maximum daily distance for females is about three to six miles. Denning habitat includes mature and old growth²⁴ forests with plenty of coarse woody debris. It can also include young regenerating forests with piles of coarse woody debris, or areas where down trees are jack-strawed.

⁷ *Designated over-the-snow routes* – Designated over-the-snow routes are routes managed under permit or agreement or by the agency, where use is encouraged, either by on-the-ground marking or by publication in brochures, recreation opportunity guides or maps (other than travel maps) or in electronic media produced or approved by the

agency. The routes identified in outfitter and guide permits are designated by definition; groomed routes also are designated by definition. The determination of baseline snow compaction will be based on the miles of designated over-the-snow routes authorized, promoted or encouraged in 1998 to 2000.

⁸ *Designated route* – A designated route is a road or trail that has been identified as open for specified travel use.

⁹ *Developed recreation* – Developed recreation requires facilities that result in concentrated use. For example, skiing requires lifts, parking lots, buildings and roads; campgrounds require roads, picnic tables and toilet facilities.

¹⁰ *Security habitat (lynx)* – Security habitat amounts to places in lynx habitat that provide secure winter bedding sites for lynx in highly disturbed landscapes like ski areas. Security habitat gives lynx the ability to retreat from human disturbance. Forest structures that make human access difficult generally discourage human activity in security habitats. Security habitats are most effective if big enough to provide visual and acoustic insulation and to let lynx easily move away from any intrusion. They must be close to winter snowshoe hare habitat. (LCAS)

¹¹ *Fire use* – Fire use is the combination of wildland fire use and using prescribed fire to meet resource objectives. (NIFC) Wildland fire use is the management of naturally ignited wildland fires to accomplish resource management objectives in areas that have a fire management plan. The use of the term wildland fire use replaces the term prescribed natural fire. (Wildland and Prescribed Fire Management Policy, August 1998)

¹² *Forest highway* – A forest highway is a forest road under the jurisdiction of, and maintained by, a public authority and open to public travel (USC: Title 23, Section 101(a)), designated by an agreement with the FS, state transportation agency and Federal Highway Administration.

¹³ *Fuel treatment* – A fuel treatment is a management action that reduces the threat of ignition and fire intensity or rate of spread, or is used to restore fire-adapted ecosystems.

¹⁴ *Goal* – A goal is a broad description of what an agency is trying to achieve, found in a land management plan. (LCAS)

¹⁵ *Guideline* – A guideline is a particular management action that should be used to meet an objective found in a land management plan. The rationale for deviations may be documented, but amending the plan is not required. (LCAS modified)

¹⁶ *Habitat connectivity (lynx)* – Habitat connectivity consists of an adequate amount of vegetation cover arranged in a way that allows lynx to move around. Narrow forested mountain ridges or shrub-steppe plateaus may serve as a link between more extensive areas of lynx habitat; wooded riparian areas may provide travel cover across open valley floors. (LCAS)

¹⁷ *HFRA (Healthy Forests Restoration Act)* - Public Law 108-148, passed in December 2003. The HFRA provides statutory processes for hazardous fuel reduction projects on certain types of at-risk National Forest System and Bureau of Land Management lands. It also provides other authorities and direction to help reduce hazardous fuel and restore healthy forest and rangeland conditions on lands of all ownerships. (Modified from Forest Service HFRA web site.)

¹⁸ *Highway* – The word highway includes all roads that are part of the National Highway System. (23 CFR 470.107(b))

¹⁹ *Horizontal cover* – Horizontal cover is the visual obscurity or cover provided by habitat structures that extend to the ground or snow surface primarily provided by tree stems and tree boughs, but also includes herbaceous vegetation, snow, and landscape topography. Horizontal cover was measured by John Squires et al. (pers. com.) in Northwestern Montana according to the following methodology:

“A canvas cover-board (2 m x 0.5 m) was erected 10 m from plot center in 4 directions (forward track, back track, and at 2, 90° angles) was read to directly measure horizontal cover. The cover board was divided into 4, 0.5 meter blocks and each block was further divided into quarters. At each reading, technicians estimated horizontal cover by 10% class at each of the 4 heights; these 4 estimates were then averaged for an overall estimate of that reading.” (According to Squires via pers. com., cover measured during the summer period averaged approximately 65% while at den sites it was measured at roughly 85%. During the winter period cover was measured at 45% while at winter kill sites it was slightly greater than 50%.)

- ²⁰ *Isolated mountain range* – Isolated mountain ranges are small mountains cut off from other mountains and surrounded by flatlands. On the east side of the Rockies, they are used for analysis instead of sub-basins. Examples are the Little Belts in Montana and the Bighorns in Wyoming.
- ²¹ *LAU (Lynx Analysis Unit)* – An LAU is an area of at least the size used by an individual lynx, from about 25 to 50 square miles (LCAS). An LAU is a unit for which the effects of a project would be analyzed; its boundaries should remain constant.
- ²² *Linkage area* – A linkage area provides connectivity between blocks of lynx habitat. Linkage areas occur both within and between geographic areas, where basins, valleys or agricultural lands separate blocks of lynx habitat, or where lynx habitat naturally narrows between blocks. (LCAS updated definition approved by the Steering Committee 10/23/01)
- ²³ *Lynx habitat* – Lynx habitat occurs in mesic coniferous forest that experience cold, snowy winters and provide a prey base of snowshoe hare. In the northern Rockies, lynx habitat is generally occurs between 3,500 and 8,000 feet of elevation, and primarily consists of lodgepole pine, subalpine fir and Engelmann spruce. It may consist of cedar-hemlock in extreme northern Idaho, northeastern Washington and northwestern Montana, or of Douglas fir on moist sites at higher elevations in central Idaho. It may also consist of cool, moist Douglas fir, grand fir, western larch and aspen when interspersed in subalpine forests. Dry forests do not provide lynx habitat. (LCAS)
- ²⁴ *Lynx habitat in an unsuitable condition* – Lynx habitat in an unsuitable condition consists of lynx habitat in the stand initiation structural stage where the trees are generally less than ten to 30 years old and have not grown tall enough to protrude above the snow during winter. Stand replacing fire or certain vegetation management projects can create unsuitable conditions. Vegetation management projects that can result in unsuitable habitat include clearcuts and seed tree harvest, and sometimes shelterwood cuts and commercial thinning depending on the resulting stand composition and structure. (LCAS)
- ²⁵ *Low-speed, low-traffic-volume road* – Low speed is less than 20 miles per hour; low volume is a seasonal average daily traffic load of less than 100 vehicles per day.
- ²⁶ *Maintain* – In the context of this amendment, maintain means to provide enough lynx habitat to conserve lynx. It does not mean to keep the status quo.
- ²⁷ *Maintenance level* – Maintenance levels define the level of service provided by and maintenance required for a road. (FSH 7709.58, Sec 12.3) Maintenance level 4 is assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most level 4 roads have double lanes and aggregate surfaced. Some may be single lane; some may be paved or have dust abated. Maintenance level 5 is assigned to roads that provide a high degree of user comfort and convenience. Normally, roads are double-lane and paved, but some may be aggregate surfaced with the dust abated.
- ²⁸ *Mid-seral or later* – Mid-seral is the successional stage in a plant community that's the midpoint as it moves from bare ground to climax. For riparian areas, it means willows or other shrubs have become established. For shrub-steppe areas, it means shrubs associated with climax are present and increasing in density.
- ²⁹ *Multi-story mature or late successional forest* – This stage is similar to the *old multistory structural stage* (see below). However, trees are generally not as old and decaying trees may be somewhat less abundant.
- ³⁰ *Objective* – An objective is a statement in a land management plan describing desired resource conditions and intended to promote achieving programmatic goals. (LCAS)
- ³¹ *Old multistory structural stage* – Many age classes and vegetation layers mark the old forest, multistoried stage. It usually contains large old trees. Decaying fallen trees may be present that leave a discontinuous overstory canopy. On cold or moist sites without frequent fires or other disturbance, multi-layer stands with large trees in the uppermost layer develop. (Oliver and Larson, 1996)
- ³² *Old growth* – Old growth forests generally contain trees that are large for their species and site, and are sometimes decadent with broken tops. Old growth often contains a variety of tree sizes, large snags and logs, and a developed and often patchy understory.
- ³³ *Permanent development* – A permanent development is any development that results in a loss of lynx habitat for at least 15 years. Ski trails, parking lots, new permanent roads, structures, campgrounds and many special use developments would be considered permanent developments.

- ³⁴ *Prescribed fire* – A prescribed fire is any fire ignited as a management action to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements met, before ignition. The term replaces management ignited prescribed fire. (NWCG)
- ³⁵ *Precommercial thinning* – Precommercial thinning is mechanically removing trees to reduce stocking and concentrate growth on the remaining trees, and not resulting in immediate financial return. (Dictionary of Forestry)
- ³⁶ *Red squirrel habitat* – Red squirrel habitat consists of coniferous forests of seed and cone-producing age that usually contain snags and downed woody debris, generally associated with mature or older forests.
- ³⁷ *Regeneration harvest* – The cutting of trees and creating an entire new age class; an even-age harvest. The major methods are clearcutting, seed tree, shelterwood, and group selective cuts (Helms 1998).
- ³⁸ *Research* – Research consists of studies conducted to increase scientific knowledge or technology. For the purposes of Standards VEG S5 and VEG S6, research applies to studies financed from the forest research budget (FSM 4040) and administrative studies financed from the NF budget.
- ³⁹ *Restore, restoration* – To restore is to return or re-establish ecosystems or habitats to their original structure and species composition. (Dictionary of Forestry)
- ⁴⁰ *Riparian area* – An area with distinctive soil and vegetation between a stream or other body of water and the adjacent upland; includes wetlands and those portions of floodplains and valley bottoms that support riparian vegetation. (LCAS)
- ⁴¹ *Salvage harvest* – Salvage harvest is a commercial timber sale of dead, damaged or dying trees. It recovers economic value that would otherwise be lost. Collecting firewood for personal use is not considered salvage harvest.
- ⁴² *Shrub steppe habitat* – Shrub steppe habitat consists of dry sites with shrubs and grasslands intermingled.
- ⁴³ *Standard* – A standard is a required action in a land management plan specifying how to achieve an objective or under what circumstances to refrain from taking action. A plan must be amended to deviate from a standard.
- ⁴⁴ *Stand initiation structural stage* – The stand initiation stage generally develops after a stand-replacing disturbance by fire or regeneration timber harvest. A new single-story layer of shrubs, tree seedlings and saplings establish and develop, reoccupying the site. Trees that need full sun are likely to dominate these even-aged stands. (Oliver and Larson, 1996)
- ⁴⁵ *Stem exclusion structural stage* – In the stem exclusion stage, trees initially grow fast and quickly occupy all of the growing space, creating a closed canopy. Because the trees are tall, little light reaches the forest floor so understory plants (including smaller trees) are shaded and grow more slowly. Species that need full sunlight usually die; shrubs and herbs may become dormant. New trees are precluded by a lack of sunlight or moisture. (Oliver and Larson, 1996)
- ⁴⁶ *Timber management* – Timber management consists of growing, tending, commercially harvesting and regenerating crops of trees.
- ⁴⁷ *Understory re-initiation structural stage* – In the understory re-initiation stage, a new age class of trees gets established after overstory trees begin to die, are removed or no longer fully occupy their growing space after tall trees abrade each other in the wind. Understory seedlings then re-grow and the trees begin to stratify into vertical layers. A low to moderately dense uneven-aged overstory develops, with some small shade-tolerant trees in the understory. (Oliver and Larson, 1996)
- ⁴⁸ *Vegetation management projects* – Vegetation management projects change the composition and structure of vegetation to meet specific objectives, using such means as prescribed fire and timber harvest. For the purposes of this amendment, the term does not include removing vegetation for permanent developments like mineral operations, ski runs, roads and the like, and does not apply to fire suppression or to wildland fire use.
- ⁴⁹ *Wildland urban interface (WUI)* - The area adjacent to an at-risk community that is identified in the community wildfire protection plan. If there is no community wildfire protection plan in place, the WUI is the area 0.5 mile from the boundary of an at-risk community or within 1.5 miles of the boundary of an at-risk community. The WUI could also include areas if the terrain is steep, or there is a nearby road or ridge top that could be incorporated into a fuel break, or the land is in condition class 3, or the area contains an emergency exit route needed for safe evacuations. (Condensed from HFRA. For full text see HFRA § 101.)

⁵⁰ *Winter snowshoe hare habitat* – Winter snowshoe hare habitat consists of places where young trees or shrubs grow dense – thousands of woody stems per acre – and tall enough to protrude above the snow during winter, so hares can browse on the bark and small twigs (Ruediger et al. 2000). Winter snowshoe hare habitat develops primarily in the stand initiation, understory reinitiation and old forest multistoried structural stage.

APPENDIX D (US Forest Service 2007)

Table I. Acres* of precommercial thinning during in lynx habitat next decade for Alternative F, Scenario 2

(Management direction would apply to occupied habitat, but not unoccupied (would follow no action – Alternative A)) full funding compared to historic average funding

| | Alternative A | | Alternative F | |
|--------------------------------|---------------|-------------------|---------------|-------------------|
| | Full funding | *Historic average | Full funding | *Historic average |
| Occupied units | | | | |
| Bridger-Teton-R4 | | | 1,000 | 340 |
| Clearwater | | | 1,930 | 670 |
| Custer | | | 1,000 | 340 |
| Flathead | | | 1,460 | 500 |
| Idaho Panhandle | | | **40,280 | 13,670 |
| Kootenai | | | **13,520 | 4,600 |
| Lolo | | | 2,200 | 750 |
| Shoshone | | | 0 | 0 |
| Targhee -R4 | | | 870 | 300 |
| Total occupied | | | 62,260 | 21,170 |
| Mix of occupied/unoccupied *** | | | | |
| Gallatin | 26,300 | 8,940 | 1,310 | 445 |
| Helena | 3,830 | 1,300 | 730 | 250 |
| Lewis & Clark | 7,410 | 2,520 | 20 | 5 |
| Total mixed | 37,540 | 12,760 | 2,060 | 700 |
| Unoccupied units | | | | |
| Beaverhead-Deerlodge | 21,280 | 7,240 | | |
| Bitterroot | 510 | 180 | | |
| Nez Perce | 12,370 | 4,210 | | |
| Salmon-Challis - R4 | 22,000 | 7,480 | | |
| Ashley -R4 | 7,710 | 2,620 | | |
| Bighorn-R2 | 3,000 | 1,020 | | |
| Total unoccupied | 66,870 | 22,750 | | |
| TOTAL | | | | |

Acres are estimates rounded to the nearest ten, and could change based on changing needs.

*Historically about 34% of precommercial thinning has been funded.

About **36,400 acres on the Idaho Panhandle and 11,720 acres on the Kootenai of precommercial thinning allowed under Alternative F is for daylight thinning of planted rust-resistant western white pine, where 80% of the cover would be retained.

***The Gallatin is 89% occupied; the Helena is 75% occupied; and the Lewis and Clark is 39% occupied

APPENDIX D cont.

Table 2. Grazing allotments in occupied and unoccupied lynx habitat

| | Number of allotments | With lynx habitat | Active with lynx habitat | Active allotments with lynx habitat: | | | |
|-------------------------------------|----------------------|-------------------|--------------------------|--------------------------------------|-----------------------|----------------------|-------------------------|
| | | | | Less than 25 percent | From 25 to 50 percent | More than 50 percent | With similar direction‡ |
| Occupied units | | | | | | | |
| Bridger-Teton | 278 | 278 | 236 | 0 | 236 | 0 | 236 |
| Clearwater | 17 | 0 | 0 | 0 | 0 | 0 | 0 |
| Custer | 133 | 24 | 24 | 13 | 4 | 7 | 24 |
| Flathead | 20 | 19 | 11 | 0 | 3 | 8 | 11 |
| Idaho Panhandle | 11 | 9 | 8 | 1 | 2 | 5 | 6 |
| Kootenai | 44 | 27 | 17 | 7 | 3 | 7 | 17 |
| Lolo | 36 | 18 | 13 | 2 | 5 | 6 | 13 |
| Shoshone | 84 | 47 | 45 | 21 | 14 | 10 | 10 |
| Targhee | 145 | 100 | 86 | 8 | 24 | 54 | 86 |
| Total Occupied | 768 | 522 | 440 | 52 | 291 | 97 | 403 |
| Mixed of occupied/unoccupied | | | | | | | |
| Gallatin | 98 | 98 | 94 | 20 | 36 | 38 | 0 |
| Helena | 88 | 88 | 75 | 27 | 30 | 18 | 25 |
| Lewis and Clark | 269 | 146 | 143 | 21 | 11 | 111 | 73 |
| Total mixed | 455 | 332 | 312 | 68 | 77 | 167 | 98 |
| Unoccupied units | | | | | | | |
| Beaverhead-Deerlodge | 318 | 318 | 315 | 91 | 80 | 144 | 315 |
| Bitterroot | 20 | 19 | 15 | 9 | 2 | 4 | 15 |
| Nez Perce | 29 | 15 | 12 | 3 | 3 | 6 | 12 |
| Salmon-Challis | 114 | 85 | 85 | 49 | 27 | 9 | 85 |
| Ashley | 68 | 68 | 51 | 6 | 19 | 26 | 51 |
| Bighorn | 106 | 61 | 59 | 13 | 23 | 23 | 59 |
| Total unoccupied | 655 | 566 | 537 | 171 | 154 | 212 | 537 |
| TOTAL | 1,878 | 1,420 | 1,289 | 291 | 522 | 476 | 1,045 |

‡ *Similar direction* includes plan standards for riparian habitat protection or other management direction for grazing.

APPENDIX D cont.

Table 3. Miles of designated or groomed winter routes and acres of designated play areas in occupied and unoccupied lynx habitat

| | <u>All groomed or designated routes, in miles</u> | <u>Inside lynx habitat</u> | | | |
|---------------------------------------|---|---|---|--|---|
| | | <u>Groomed or designated routes, in miles</u> | <u>Average designated routes groomed/year, in miles</u> | <u>Designated routes that could be groomed, in miles</u> | <u>Designated play areas (Number) & acres</u> |
| Occupied units | | | | | |
| Bridger-Teton | 850 | 850 | 750 | 100 | 0 |
| Clearwater | 1,025 | 500 | 425 | 75 | 0 |
| Custer | 50 | 25 | 0 | 25 | 0 |
| Flathead | 175 | 175 | 175 | 0 | 0 |
| Idaho Panhandle | 1,450 | 975 | 475 | 500 | 0 |
| Kootenai | 425 | 250 | 175 | 75 | 0 |
| Lolo | 700 | 375 | 300 | 75 | 0 |
| Shoshone | 500 | 150 | 100 | 50 | 0 |
| Targhee | 1,000 | 400 | 400 | 0 | 0 |
| Total occupied | 6,175 | 3700 | 2800 | 900 | 0 |
| Mix of occupied and unoccupied | | | | | |
| Gallatin | 425 | 350 | 305 | 50 | 0 |
| Helena | 375 | 275 | 200 | 75 | (2) for 3,750 |
| Lewis & Clark | 825 | 600 | 225 | 400 | (2) for 300 |
| Total mixed | 1625 | 1225 | 730 | 525 | (4) for 4,050 |
| Unoccupied units | | | | | |
| Beaverhead-Deerlodge | 1,000 | 575 | 275 | 300 | 0 |
| Bitterroot | 250 | 100 | 25 | 75 | 0 |
| Nez Perce | 2,275 | 1,075 | 275 | 775 | 0 |
| Salmon-Challis | 1,500 | 1,125 | 225 | 900 | 0 |
| Ashley | 125 | 125 | 120 | 0 | 0 |
| Bighorn | 425 | 50 | 25 | 25 | 0 |
| Total unoccupied | 5,575 | 3,050 | 945 | 2,075 | 0 |
| TOTAL | 13,375 | 7,975 | 4,475 (56%) | 3,500 (44%) | (4) for 4,050 |

The table contains estimated miles for each unit rounded to the nearest 25, as of January 2004. The baseline miles need to be established by each unit once a decision is made. The lynx amendment is not setting these as the baseline figures. These data may be updated as each unit conducts further site specific analysis to map the baseline, and for travel planning.

APPENDIX D cont.

Table 4. Recreation special use permits (SUPs) and agreements in occupied and unoccupied lynx habitat

| | <u>Recreation SUPs and agreements</u> | <u>Winter recreation SUPs and agreements</u> | <u>Winter recreation SUPs and agreements in lynx habitat</u> |
|---|---------------------------------------|--|--|
| Occupied units | | | |
| Bridger-Teton | 227 | 39 | 39 |
| Clearwater | 37 | 6 | 3 |
| Custer | 17 | 0 | 0 |
| Flathead | 201 | 8 | 8 |
| Idaho Panhandle | 195 | 25 | 24 |
| Kootenai | 61 | 19 | 19 |
| Lolo | 141 | 24 | 20 |
| Shoshone | 279 | 25 | 20 |
| Targhee | 325 | 24 | 21 |
| Total occupied | 1483 | 170 | 154 |
| Mix of occupied and unoccupied habitat | | | |
| Gallatin | 376 | 30 | 30 |
| Helena | 58 | 8 | 6 |
| Lewis and Clark | 21 | 21 | 21 |
| | 455 | 59 | 57 |
| Unoccupied units | | | |
| Beaverhead-Deerlodge | 28 | 4 | 4 |
| Bitterroot | 211 | 7 | 7 |
| Nez Perce | 64 | 17 | 15 |
| Salmon-Challis | 114 | 14 | 14 |
| Ashley | 24 | 2 | 2 |
| Bighorn | 343 | 86 | 85 |
| Total unoccupied | 784 | 130 | 127 |
| TOTAL | 2,722 | 359 | 338 |

**Table 5. Cross-country and downhill ski areas operating under special use permit
In occupied and unoccupied lynx habitat**

| | Inside lynx habitat | | | | |
|---|---------------------|---------------|---------------|---------------------------|--------------------------|
| | <u>Ski areas</u> | <u>Number</u> | <u>Acres</u> | <u>Planning expansion</u> | <u>New areas planned</u> |
| Occupied units | | | | | |
| Bridger-Teton | 5 | 5 | 4,620 | 0 | 0 |
| Clearwater | 0 | 0 | 0 | 0 | 0 |
| Custer | 1 | 1 | 1,288 | 1 | 0 |
| Flathead | 6 | 5 | 3,749 | 1 | 0 |
| Idaho Panhandle † | 2 | 0 | 0 | 1 | 0 |
| Kootenai | 3 | 1 | 2,640 | 1 | 1 |
| Lolo † | 3 | 2 | 1,412 | 1 | 0 |
| Shoshone | 10 | 1 | 2 | 0 | 0 |
| Targhee | 2 | 2 | 974 | 1 | 0 |
| Total occupied | 32 | 17 | 14,685 | 6 | 1 |
| Mix of occupied and unoccupied habitat | | | | | |
| Gallatin | 2 | 2 | 956 | 1 | 0 |
| Helena | 3 | 2 | 320 | 0 | 0 |
| Lewis & Clark | 3 | 3 | 1,498 | 1 | 0 |
| Total mixed | 8 | 7 | 2,774 | 2 | 0 |
| Unoccupied units | | | | | |
| Beaverhead-Deerlodge | 2 | 2 | 1,999 | 1 | 0 |
| Bitterroot ‡ | 0 | 0 | 0 | 0 | 0 |
| Nez Perce | 1 | 0 | 0 | 0 | 0 |
| Ashley | 0 | 0 | 0 | 0 | 0 |
| Salmon-Challis ‡ | 1 | 1 | 1,401 | 1 | 0 |
| Bighorn | 6 | 1 | 400 | 0 | 0 |
| Total unoccupied | 10 | 4 | 3,800 | 2 | 0 |
| TOTAL | 50 | 28 | 21,259 | 10 | 1 |

† The Idaho Panhandle and Lolo National Forests both have parts of the Lookout Pass ski area within their administrative boundaries. On this table it is listed under the Lolo in Montana.

‡ The Salmon-Challis and Bitterroot National Forests both have parts of the Lost Trail ski area within their administrative boundaries. On this table it is listed under the Salmon-Challis NF in Idaho.

APPENDIX D cont.

Table 6. Mining operations and wells in occupied and unoccupied lynx habitat

| | Wells in last 10 years | | Foreseeable wells or pads* | Minerals operations | |
|---|------------------------|-----------------|----------------------------|---------------------|--------------------------|
| | Drilled | Outside habitat | | Number | Name of major operations |
| Occupied units | | | | | |
| Bridger-Teton | 0 | Several | 24 | 0 | - |
| Clearwater | 0 | 0 | 0 | 0 | - |
| Custer | 2* | 0 | 2 | 1 | Stillwater |
| Flathead | 0 | 0 | 0 | 0 | - |
| Idaho Panhandle | 0 | 0 | 0 | 0 | - |
| Kootenai | 0 | 0 | 0 | 1 | Troy |
| Lolo | 0 | 0 | 0 | 1 to 5 | - |
| Shoshone | 0 | 1 | 1 | 0 | - |
| Targhee | 0 | 0 | 0 | 0 | - |
| Total occupied | 2 | several | 27 | 3 to 5 | |
| Mix of occupied and unoccupied habitat | | | | | |
| Gallatin | 0 | 0 | 0 | 1 | East Boulder |
| Helena | 1* | 0 | 2 | 2 to 3 | - |
| Lewis and Clark | 0 | 0 | 2 | 0 | - |
| Total mixed | 1 | 1 | 4 | 3 to 4 | |
| Unoccupied units | | | | | |
| Beaverhead-Deerlodge | 0 | 0 | 4 | 2 | Beal & Golden Jubilee |
| Bitterroot | 0 | 0 | 0 | 0 | - |
| Nez Perce | 0 | 0 | 0 | 0 | - |
| Salmon-Challis | 0 | 0 | 0 | 0 | - |
| Ashley | 0 | 0 | 3 | 1 | - |
| Bighorn | 0 | 0 | 1 | 0 | - |
| Total unoccupied | 0 | 0 | 8 | 3 | |
| TOTAL | 1 | 3+ | 39 | 9 to 14 | - |

*Pads with multiple wells on the same location are counted as "1 well or pad" since the disturbance is comparable to a single well.

**One well on the Helena NFis on private land within the National Forest boundary has been plugged and abandoned. The two wells on the Custer NF are also plugged and abandoned.

APPENDIX D cont.

Table 7. Miles of forest roads in occupied and unoccupied lynx habitat, part I

| | <u>Maintenance level 2</u> | <u>Maintenance levels 3 to 5</u> | <u>Paved 2 or more lanes</u> | | <u>Environmental paving</u> | |
|---|----------------------------|----------------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------|
| | | | <u>Paved last 10 years</u> | <u>Planned next 10 years</u> | <u>Paved last 5 years</u> | <u>Planned next 5 years</u> |
| | | | | | | |
| Occupied units | | | | | | |
| Bridger-Teton | 848 | 624 | 0 | 0 | 1 | 1 |
| Clearwater | 299 | 184 | 0 | 0 | 0 | 0 |
| Custer | 95 | 50 | 0 | 6.6 | 0 | 0 |
| Flathead | 500 | 795 | 0 | 0 | 0 | 1 |
| Idaho Panhandle | 1,166 | 830 | 0 | 0 | 0 | 0 |
| Kootenai | 400 | 450 | 0 | 0 | 1 | 0 |
| Lolo | 704 | 621 | 0 | 7.1 | 0 | 0 |
| Shoshone | 197 | 58 | 2 | 0 | 0 | 0 |
| Targhee | 138 | 557 | 2.2 | 5 | 0 | 0 |
| Total occupied | 4,347 | 4169 | 4.2 | 18.7 | 2 | 2 |
| Mix of occupied and unoccupied habitat | | | | | | |
| Gallatin | 981 | 202 | 0.5 | 8 | 0 | 0 |
| Helena | 447 | 168 | 0 | 5 | 0 | 0 |
| Lewis and Clark | 327 | 323 | 0 | 0 | 0 | 0 |
| Mixed total | 1755 | 693 | 0.5 | 13 | 0 | 0 |
| Unoccupied habitat | | | | | | |
| Beaverhead-Deerlodge | 1,050 | 741 | 10 | 5 | 0 | 0 |
| Bitterroot | 120 | 130 | 0 | 0 | 0 | 0 |
| Nez Perce | 386 | 372 | 0 | 7 | 0 | 0 |
| Salmon-Challis | 670 | 420 | 0 | 0 | 0 | 0 |
| Ashley | 211 | 353 | 0 | 1.7 | 0 | 0 |
| Bighorn | 125 | 51 | 0 | 0 | 0 | 0 |
| Total unoccupied | 2,562 | 2,067 | 10 | 13.7 | 0 | 0 |
| TOTAL | 8,664 | 6,929 | 14.7 | 45.4 | 2 | 2 |

Table 8. Forest roads in occupied and unoccupied lynx habitat, part 2

| | New open last 5 years | New open planned next 5 years | Upgrades planned next 5 years | On ridge-top planned next 10 years |
|---|------------------------------|--------------------------------------|--------------------------------------|---|
| Occupied habitat | | | | |
| Bridger-Teton | 10 | 0 | 100 | 2 |
| Clearwater | 0.4 | 0 | 7.2 | 2.8 |
| Custer | 0 | 0 | 14 | 0 |
| Flathead | 2 | 0 | 0 | 0 |
| Idaho Panhandle | 0.7 | 0 | 0 | 0 |
| Kootenai | 0 | 0 | 4 | 0 |
| Lolo | 0 | 0 | 63.4 | 0 |
| Shoshone | 0 | 0 | 3.6 | 0 |
| Targhee | 0.8 | 2.5 | 5 | 0.2 |
| Total occupied | 13.9 | 2.5 | 197.2 | 5 |
| Mix of occupied and unoccupied habitat | | | | |
| Gallatin | 0 | 0 | 5 | 2 |
| Helena | 0 | 0 | 20 | 0 |
| Lewis and Clark | 0 | 0 | 0 | 0 |
| Total mixed | 0 | 0 | 25 | 0 |
| Unoccupied habitat | | | | |
| Beaverhead-Deerlodge | 0.3 | 2.4 | 1.5 | 0 |
| Bitterroot | 0 | 0 | 0 | 0 |
| Nez Perce | 0 | 0 | 0 | 0 |
| Salmon-Challis | 0 | 0 | 12 | 0 |
| Ashley | 0 | 0 | 1.7 | 0 |
| Bighorn | 0.2 | 0 | 0 | 0 |
| Total unoccupied | .5 | 2.4 | 15.2 | 0 |
| TOTAL | 14.4 | 4.9 | 237.4 | 7 |

APPENDIX E (adapted from U.S. Forest Service 2007)

| Unit | Unit Acres | Acres of lynx habitat | % of lynx habitat | Acres within WUI* | Acres of lynx habitat within WUI* | % of acres within WUI* that are lynx habitat | % of all lynx habitat within WUI* | Lynx habitat treated in WUI* over a 10 year period | | | | Total | | Total 10 yr fuel treatment program |
|------------------------------|------------|-----------------------|-------------------|-------------------|-----------------------------------|--|-----------------------------------|--|-------------------|-----------------------|-------------------|-----------------------------|-------------------|------------------------------------|
| | | | | | | | | Inside WUI* | | Outside WUI* | | Total acres of lynx habitat | % of lynx habitat | |
| | | | | | | | | Acres of lynx habitat | % of lynx habitat | Acres of lynx habitat | % of lynx habitat | | | |
| Occupied Lynx Habitat | | | | | | | | | | | | | | |
| Bridger-Teton NF | 3,437,527 | 2,000,000 | 58.2% | 70,700 | 43,900 | 62.1% | 2.2% | 22,320 | 1.1% | 71,920 | 3.6% | 94,240 | 4.7% | 160,000 |
| Clearwater NF | 1,825,397 | 930,000 | 50.9% | 50,900 | 90 | 0.2% | 0.0% | 0 | 0.0% | 63,750 | 6.9% | 63,750 | 6.9% | 144,000 |
| Custer NF | 1,187,621 | 230,000 | 19.4% | 79,200 | 22,800 | 28.8% | 9.9% | 1,450 | 0.6% | 20,330 | 8.8% | 21,780 | 9.5% | 112,000 |
| Flathead NF | 2,355,592 | 1,730,000 | 73.4% | 247,000 | 131,800 | 53.4% | 7.6% | 32,330 | 1.9% | 34,310 | 2.0% | 66,640 | 3.9% | 108,000 |
| Gallatin NF | 1,806,565 | 870,000 | 48.2% | 252,400 | 94,400 | 37.4% | 10.9% | 16,650 | 1.9% | 2,400 | 0.3% | 19,050 | 2.2% | 50,000 |
| Helena NF | 975,387 | 440,000 | 45.1% | 180,300 | 69,300 | 38.4% | 15.8% | 19,000 | 4.3% | 12,150 | 2.8% | 31,150 | 7.1% | 77,000 |
| Idaho Pan NF | 2,498,234 | 1,170,000 | 46.8% | 667,600 | 72,300 | 10.8% | 6.2% | 4,290 | 0.4% | 39,010 | 3.3% | 43,300 | 3.7% | 122,000 |
| Kootenai NF | 2,242,468 | 1,010,000 | 45.0% | 651,600 | 52,000 | 8.0% | 5.1% | 6,960 | 0.7% | 36,000 | 3.6% | 42,960 | 4.3% | 167,000 |

| | | | | | | | | | | | | | | |
|--------------------------------|-------------------|-------------------|--------------|------------------|----------------|--------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|------------------|
| Lewis & Clark NF | 1,862,289 | 970,000 | 52.1% | 69,100 | 35,800 | 51.8% | 3.7% | 17,160 | 1.8% | 17,680 | 1.8% | 34,840 | 3.6% | 67,000 |
| Lolo NF | 2,082,784 | 1,110,000 | 53.3% | 556,800 | 71,200 | 12.8% | 6.4% | 16,900 | 1.5% | 32,330 | 2.9% | 49,230 | 4.4% | 130,000 |
| Shoshone NF | 2,436,850 | 640,000 | 26.3% | 24,300 | 7,600 | 31.3% | 1.2% | 18,910 | 3.0% | 17,160 | 2.7% | 36,070 | 5.6% | 127,000 |
| Targhee NF | 1,810,854 | 1,050,000 | 58.0% | 100,000 | 55,400 | 55.4% | 5.3% | 14,300 | 1.4% | 45,820 | 4.4% | 60,120 | 5.7% | 105,000 |
| Total | 24,521,568 | 12,150,000 | 49.5% | 2,949,900 | 656,590 | 22.3% | 5.4% | 170,270 | 1.4% | 392,860 | 3.2% | 563,130 | 4.6% | 1,369,000 |
| Unoccupied Lynx Habitat | | | | | | | | | | | | | | |
| Ashley NF | 1,384,136 | 700,000 | 50.6% | 56,000 | 27,200 | 48.6% | 3.9% | 31,360 | 4.5% | 101,490 | 14.5% | 132,850 | 19.0% | 263,000 |
| B-D NF | 3,360,825 | 2,060,000 | 61.3% | 211,700 | 154,400 | 72.9% | 7.5% | 36,500 | 1.8% | 13,420 | 0.7% | 49,920 | 2.4% | 72,000 |
| Bighorn NF | 1,107,671 | 310,000 | 28.0% | 43,400 | 7,800 | 18.0% | 2.5% | 13,640 | 4.4% | 18,760 | 6.1% | 32,400 | 10.5% | 89,000 |
| Bitterroot NF | 1,580,948 | 640,000 | 40.5% | 202,300 | 17,600 | 8.7% | 2.8% | 4,680 | 0.7% | 16,400 | 2.6% | 21,080 | 3.3% | 93,000 |
| Nez Perce NF | 2,224,230 | 810,000 | 36.4% | 119,800 | 15,800 | 13.2% | 2.0% | 5,200 | 0.6% | 27,360 | 3.4% | 32,560 | 4.0% | 116,000 |
| Salmon-Challis NF | 4,350,827 | 1,800,000 | 41.4% | 163,800 | 83,200 | 50.8% | 4.6% | 22,440 | 1.2% | 27,060 | 1.5% | 49,500 | 2.8% | 110,000 |
| Total | 14,008,637 | 6,320,000 | 45.1% | 797,000 | 306,000 | 38.4% | 4.8% | 113,820 | 1.8% | 204,490 | 3.2% | 318,310 | 5.0% | 743,000 |

* WUI= Within 1 mile of communities with >28 people/sq. mi.

APPENDIX F (U.S. Forest Service 2007)

Non-developmental = GIS Categories 1-3

1. Natural, unmodified environments

In *natural, unmodified environments*, ecological processes such as fire, insects, and disease operate relatively free from human intervention. Diversity resulting from natural succession and disturbance predominate and non-native vegetation is rare.

Users must be self-reliant and expect little contact with others. Few if any structural improvements exist; travel is usually non-motorized.

Natural, unmodified environments are usually Designated Wilderness, Wilderness Study Areas, Research Natural Areas, backcountry lands, or rivers that are designated, suitable, or eligible for classification as Wild Rivers.

2. Special natural areas

In *special natural areas*, representative or rare, narrowly distributed ecological settings or components are conserved, helping to make sure the pieces and functions are saved to provide for the overall sustainability of larger landscapes.

The influences of humans on the ecosystem are sometimes evident. Human uses vary but generally are non-intensive. Travel is generally non-motorized.

Some of these areas serve as a "natural" reference for areas that are heavily managed for particular objectives. Special natural areas are often formally designated. They include some Research Natural Areas, most Areas of Critical Environmental Concern, many old growth reserves, rivers that are designated, suitable, or eligible for classification as Scenic Rivers outside of Wilderness, and some other areas.

3. Essentially unmodified forested and grassland ecosystems

In *essentially unmodified forested and grassland ecosystems*, although characterized by natural appearing landscapes, an array of management tools may be used to restore or maintain ecological processes, resulting in some evidence of human activities. Normally, natural processes and patterns predominate.

Ecological values are in balance with human occupancy, and consideration is given to both. Users may expect to experience some challenge and risk. Restrictions on motorized travel vary from area to area and season to season. Essentially unmodified forested and grassland ecosystems include lands unsuitable for timber production that have no planned harvest, special-status species habitat areas, and areas designated for and occupied by wild horses or burros.

Developmental = Categories 4-8

4. Natural appearing, but modified for human use and occupancy

In areas that are *natural appearing, but modified for human use and occupancy*, ecological values are managed to provide recreational use, but maintained well within levels necessary to maintain ecological systems. Resource use is not emphasized and has little impact.

Sights and sounds of humans can be expected. Motorized transportation is common.

Such lands include environmental education sites, rivers that are designated, suitable or eligible for classification as recreational, non-linear recreation sites and areas, and all other Areas of Critical Environmental Concern not included in special natural areas.

5. Modified forest ecosystems

Modified forest ecosystems are primarily forested ecosystems managed to meet a variety of needs. Ecologic conditions will be maintained with an emphasis on selected structures and compositions within the range of natural variability.

These lands often display high levels of forest management investment, use or activity, evidence of vegetative manipulation, and many facilities.

Users expect to see other humans and the evidence of human activities. Motorized transportation is common.

6. Modified grassland

Modified grasslands are grasslands but include many woodland ecosystems, managed to meet a variety of needs. Ecologic objectives are likely to emphasize selected structures and compositions within the range of natural variability.

These lands often display high levels of forest management investment, use or activity, evidence of vegetative manipulation, and many facilities. A wide variety of structure and composition is present.

Users expect to see other humans and the evidence of human activities. Motorized transportation is common.

7. Areas modified by human occupation and activities

In *areas modified by human occupation and activities*, public lands are intermingled with private lands to the point that public landowners cannot effectively manage for ecological values without the support and cooperation of the private sector.

Human activities have altered the natural appearances in most of these areas. The sight and sound of humans predominates. Private land use is often intensive agriculture, industrial, or residential.

Resource use may not be planned on a sustainable basis but may occur in concert with surrounding private land values. Motorized transportation is common.

8. Modified non-sustainable areas

In *modified non-sustainable areas*, ecological conditions and processes likely are or have been permanently altered by humans beyond the point where natural appearing landscapes and ecological processes can be maintained. The areas are generally small; they may include mines or other concentrated uses.

Ecological values are protected where they affect the health and welfare of humans. Human activities are generally commercial, directly or indirectly providing jobs and income. Motorized transportation is common.

January 8, 2008

Kathy McAllister, Acting Regional Forester
U.S. Forest Service, Northern Regional Office
200 East Broadway
Missoula, Montana 59802

Dear Ms. McAllister:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion on the effects of the Northern Rocky Mountains Lynx Amendment on the Distinct Population Segment (DPS) of Canada lynx (*Lynx canadensis*) (lynx) in the contiguous United States, in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The Service received your November 23, 2005, request for formal consultation on behalf of the U.S. Forest Service (Forest Service) and Bureau of Land Management (BLM) on November 29, 2005. We received your revised biological assessment on December 13, 2006, indicating that Forests and/or areas identified as not currently occupied by lynx would not have specific management direction for lynx until such time as those areas are occupied. We also note that on December 20, 2006, we were notified that the BLM had decided to withdraw from this particular amendment process, as they manage relatively minor amounts of lynx habitat within the project area, and were involved in separate planning efforts in Idaho and Utah (Ray Smith, U.S. Forest Service, pers.comm. 2006). In response, on January 10, 2007 we received your January 4, 2007 revised biological assessment (reflecting the withdrawal of BLM lands).

This biological opinion is based primarily on information provided in the January 4, 2007 revised Biological Assessment (BA) (U.S. Forest Service 2007); various supplemental information supplied by the Forest Service and contained in this document or in our project file; the Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000); the Lynx Conservation Agreement of which the Forest Service and the Service are signatories (U.S. Forest Service and U.S. Fish and Wildlife Service 2005 and 2006); the Lynx Science Report (Ruggiero et al. 2000a); and more recent research and information. We also considered information in our files, including but not limited to information related to the final listing rule (March 24, 2000; 65 FR 16052), the clarification of findings (July 3, 2003; 68 FR 40076), the final critical habitat designation (November 9, 2006; 71 FR 66008), our remanded determination in our clarifications of findings of our final rule (January 10, 2007; 72 FR 1186), the lynx recovery plan outline (U.S. Fish and Wildlife Service 2005), and various agency correspondence as part of our deliberations. A complete record of this formal consultation is on file at the Service's Regional and Montana Fish and Wildlife Offices.

The Service concurs with the Forest Service's determinations that the proposed action is not likely to adversely affect the following federally listed species: gray wolf (*Canis lupus*), grizzly bear (*Ursus arctos horribilis*), woodland caribou (*Rangifer tarandus caribou*), chinook salmon (*Oncorhynchus tshawytscha*), sockeye salmon (*Oncorhynchus nerka*), and bull trout (*Salvelinus confluentus*). We concur with the rationale for these findings found in the BA.

Consultation History

On October 25, 2000, we issued a biological opinion on the National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans on Canada lynx in the contiguous United States. The Forest Service/BLM proposal was designed to moderate the effects of the plans on lynx on Forest Service and BLM lands until their management plans could be amended to incorporate lynx management strategies. In the interim, the Plans would be implemented under the Conservation Agreements (see (3) below), which required the use of the best available information, including the LCAS, to determine whether projects were likely to adversely affect lynx or not. Projects that were likely to adversely affect lynx were deferred until Plans were amended to consider the conservation of lynx (with a few exceptions for third party projects). The 2000 biological opinion considered the effects of implementing the Forest Plans under the interim strategy (i.e. implementing the Plans under the Conservation Agreements) on a national basis and determined that its effects did not jeopardize the continued existence of the species, and in fact, constituted a benefit over the status quo (i.e. current Forest Plan direction). Furthermore, our 2000 biological opinion also concluded that if Plans were amended or revised to incorporate the conservation measures in the LCAS (see below), or an equivalent thereof, the Plans would not likely jeopardize the continued existence of lynx.

Thus, the Forest Service has increased lynx conservation efforts since 2000 on an interim basis, in part by following the Conservation Agreements (2000; 2005; 2006). The Conservation Agreements were very conservative in that it required deferral of most projects that would likely adversely affect lynx, which was considered an appropriate interim direction until full consideration could be given to amending or revising Forest Plans to conserve lynx overall.

The 2000 consultation built upon the efforts of the National Interagency Lynx Steering Committee (comprised of representatives from the Service, Forest Service, BLM, and NPS), a coordination effort that directed or resulted in the compilation of the following documents considered essential for understanding lynx ecology and implementing appropriate conservation measures on Federal lands:

- (1) Lynx Science Report—A Science Team was selected to prepare a scientific report that amassed and interpreted all available scientific knowledge regarding Canada lynx, lynx prey, and lynx habitats. This report was first distributed to the public electronically in 1999, and subsequently published as a book entitled “Ecology and Conservation of Lynx in the United States” (Ruggiero et al. 2000a). Hereafter, this publication will be referred to as the Science Report.

- (2) Canada Lynx Conservation Assessment and Strategy—(LCAS) An interagency Lynx Biology Team used information provided in the Science Report to develop a conservation strategy for Canada lynx on Federal lands. This effort was initiated through an action plan approved by the affected Regional Foresters of the Forest Service, State Directors of the BLM, and Regional Directors of the Service by memorandum dated June 5, 1998. Publication of the LCAS (Ruediger et al. 2000) culminated this effort. A revision of the LCAS by the cooperating agencies is underway.
- (3) U.S. Forest Service Canada Lynx Conservation Agreements—The Forest Service (Regions 1, 2, 4, 6, and 9) and the Service (Regions 1, 3, 5, and 6) entered a Canada Lynx Conservation Agreement on February 7, 2000, to promote the conservation of lynx and lynx habitat on lands managed by the Forest Service (U.S. Forest Service and U.S. Fish and Wildlife Service 2000).

The agreement was revised and extended in May 2005 (U.S. Forest Service and U.S. Fish and Wildlife Service 2005). In the revised agreement, one change from the original was that the conservation agreement would apply only to those National Forest lands mapped as “occupied lynx habitat.” In May 2006, the revised conservation agreement was amended to include a definition of “occupied lynx habitat” (U.S. Forest Service and U.S. Fish and Wildlife Service 2006). The Service issued internal guidance for coordination and consultation with the Forest Service in 2006 (U.S. Fish and Wildlife Service in litt. 2006).

- (4) Bureau of Land Management Canada Lynx Conservation Agreement—The BLM (Colorado, Idaho, Montana, Oregon/Washington, Utah, and Wyoming) and the Service (Regions 1 and 6) entered a Canada Lynx Conservation Agreement on August 18, 2000, to promote the conservation of lynx and lynx habitat on Federal lands managed by the BLM. Although this conservation agreement expired in December 2004, the BLM continues to adhere to their original agreement (70 FR 68308).

In 1999, the Deputy Regional Forester, Northern Region, in her capacity as Chair of the National Interagency Lynx Steering Committee, provided the affected Forests with direction and information for proceeding with conferencing (or consultation should the lynx be listed) (U.S. Forest Service in litt. 1999). Each National Forest was advised to begin mapping lynx habitats in coordination with respective Service field offices. Specific tasks outlined in the memorandum included the preparation of maps of lynx habitat on National Forests and BLM districts, and the delineation of Lynx Analysis Units (LAUs) (as recommended in the then draft LCAS) within mapped lynx habitat.

Lynx habitat maps were developed using the best available information regarding lynx habitat types, as well as the best mapping resources available to the Forest Service at the time. The types of mapping resources and technology available on each Forest varied, and thus the accuracy and precision varied as well. Further examination and refinement of lynx habitat mapping followed. During 1999, interagency meetings were held, including state-specific meetings with local Service, Forest Service and BLM representatives to refine lynx habitat maps and LAU designations. Since then, the Service, Forest Service and BLM, aided by the Lynx Biology Team and lynx scientists, have further refined lynx maps through better mapping

techniques and several ground truthing exercises (Jim Claar, U.S. Forest Service pers. comm. 2006). Thus, we expect that lynx habitat maps and LAUs would be further refined and improved as information becomes available. It is important to note that lynx habitat types, were identified on all National Forests, without consideration at that time, of whether or not lynx were actually present in those areas.

Between 1999 and 2002 the Forest Service conducted an extensive National Lynx Survey to detect the presence of lynx on National Forests throughout the range of the United States lynx DPS (J. Claar, pers. comm. 2007).

In 2005 the Service, along with representatives from the Forest Service, completed a Recovery Outline for the Contiguous United States Distinct Population Segment of the Canada Lynx (recovery outline) (U.S. Fish and Wildlife Service 2005). This recovery outline is to serve as an interim strategy to guide recovery efforts until a final recovery plan is completed. The outline identifies core, secondary, and peripheral areas for lynx and preliminary recovery actions.

This current consultation addresses proposed amendments to the Land and Resource Management Plans on 18 National Forests in the Northern Rocky Mountains analysis area. The proposed amendments will replace the interim strategy of implementing the 18 Forest Plans under the Conservation Agreements (2000, 2005 and 2006). The proposed amendments were designed to address the significant factor causing the lynx to be listed as a threatened species, which was the lack of Federal land management plan guidance to conserve lynx and the potential for these plans to allow or direct actions that adversely affect lynx (March 24, 2000; 65 FR 16052). This biological opinion replaces the previous national consultation (U.S. Fish and Wildlife Service 2000) for the Land and Resource Management Plans on 18 National Forests in Idaho, Montana, and Wyoming (see Appendix A for list).

Similar to the 2000 biological opinion, this consultation on the amended Forest Plans represents the first tier of a tiered consultation framework, with each subsequent project that may affect lynx as implemented under the amended Forest Plans being the second tier of consultation. Second tier biological opinions would be issued as appropriate, where proposed actions would result in adverse effects to lynx. These second tier biological opinions would reference back to this biological opinion to ensure that the effects of specific projects under consultation, taken together with all other second tier projects are commensurate with the effects anticipated in this biological opinion. With each subsequent second tier biological opinion, the cumulative total of incidental take exempted would be tracked along with all other take that had been exempted.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Action Area

The Forest Service proposes to amend Land and Resource Management Plans (Plans) of 18 National Forests to manage lynx habitat as described and detailed in the BA and supplemental information. This action area includes the 18 National Forests within the states of Idaho, Montana, Utah, and Wyoming. See Appendix A of this document for a list of National Forests covered by this biological opinion. A map of the action area is included as Appendix B (or see <http://www.fs.fed.us/r1/planning/lynx.html>). The NRLA area encompasses approximately 38,530,000 acres of National Forest System lands. A subset of these acres constitute lynx habitat. Of the acreage in the NRLA area, 18,470,000 acres of National Forest lands are considered lynx habitat.

Proposed Action

The Forest Service proposes to amend the Plans on the 18 National Forests listed in Appendix A to incorporate management direction from the LCAS, with modifications and additions based on recent information. The Forest Service manages lands in the action area under many programs; however, not all of these programs affect lynx. This biological opinion only addresses forest management programs that have the potential to affect lynx. Forest Service land management has the *potential* to influence 15 factors that impact lynx: denning habitat, foraging habitat, habitat conversions, vegetation thinning, fire management, landscape patterns, road management, developed recreation, non-winter recreation, winter recreation, minerals, connectivity, land adjustments, coordination, and monitoring (Hickenbottom et al. 1999). Thus, the Forest Service proposes to amend existing management plans by incorporating additional management direction to address these factors to protect lynx where they occur. The amendment affects the following programs: vegetation management, including pre-commercial thinning, timber harvest, fuels management, and salvage harvest, and forest roads, livestock grazing, minerals, developed recreation, non-winter dispersed recreation, habitat connectivity, and winter recreation.

The NRLA draft Environmental Impact Statement (DEIS) (U.S. Forest Service 2004) proposed that amendment management direction be applied to all habitats that could support lynx. In 2005 and 2006, the revised Canada Lynx Conservation Agreement (U.S. Forest Service and U.S. Fish and Wildlife Service 2005 and 2006) directed that the agreement would apply only to those National Forest lands mapped as “occupied lynx habitat”. The 2006 amended conservation agreement defined occupied lynx habitat:

“All lynx habitat on an entire Forest is considered “occupied” by lynx when:

- 1) There are at least two verified lynx observations or records since 1999 on the national forest unless they are verified to be transient individuals; or
- 2) There is evidence of lynx reproduction on the national forest.”

The Forest Service applied this concept to develop the current proposed action. The BA explains that for areas identified as **occupied lynx habitat** in the conservation agreement (U.S. Forest Service and U.S. Fish and Wildlife Service 2006), management direction would include the objectives, standards, guidelines, and monitoring identified under the proposed action (see Appendix C). Areas identified as **unoccupied lynx habitat** would not have any mandatory management direction for lynx until such time as those Forests and areas become occupied; until then, the amendment direction would be “considered”. The Service notes that verification of lynx to be transient would likely take additional surveys of the area in which the records were acquired, or some other action in order to discount the possibility that the animal has an established territory or home range. If and when lynx occupy Forests that are currently unoccupied, or portions of Forests in disjunct areas with unoccupied lynx habitat, the Forests would begin implementing the direction in the proposed action.

Appendix C of this document contains a comparison provided in the BA of the baseline management, Alternative B (the NRLA LCAS-based Forest Plan alternative) and the proposed action, Alternative F. Note that the Forest Service *would not* apply the measures in the proposed action in areas unoccupied by lynx, until lynx are determined to be present in those areas. This factor is not reflected in the comparison of Alternatives contained in our Appendix C.

Occupied lynx habitat

Within the NRLA area, 12 National Forests, encompassing 12,150,000 acres (BA), are considered **occupied** by lynx (U.S. Forest Service and U.S. Fish and Wildlife Service 2006) and full amendment direction would apply (Table 1.) Further, all Forests within the NRLA that were designated core area, as defined in the lynx recovery outline, are occupied by lynx (U.S. Forest Service and U.S. Fish and Wildlife Service 2006). Nine of the 12 occupied Forests are entirely or partially in lynx core area (C) (U.S. Fish and Wildlife Service 2005), three are in secondary area (S), and three have lynx habitat in both core and secondary areas:

- Bridger-Teton National Forest (C)
- Clearwater National Forest (S)
- Custer National Forest (C and Peripheral)
- Flathead National Forest (C)
- Gallatin National Forest (C and S)
- Helena National Forest (C and S)
- Idaho Panhandle National Forest (S)
- Kootenai National Forest (C)
- Lewis and Clark National Forest (C, S and Peripheral)
- Lolo National Forest (C)
- Shoshone National Forest (C)
- Targhee National Forest (S)

Unoccupied lynx habitat

Of the 18 National Forests within the action area, 6 encompass 6,320,000 acres of lynx habitat (BA) that are currently **unoccupied** by lynx (U.S. Forest Service and U.S. Fish and Wildlife

Service 2006). Amendment management direction would not be mandatory, but may be “considered”. None of these six Forests are within the core areas identified in the lynx recovery outline. Of these six, four are in secondary area and two are in peripheral areas only:

- Ashley National Forest (Peripheral lynx habitat only)
 - Beaverhead-Deerlodge National Forest (S)
 - Bighorn National Forest (Peripheral lynx habitat only)
 - Bitterroot National Forest (S)
 - Nez Perce National Forest (S)
 - Salmon-Challis National Forest (S)
-
- Further, portions of the Helena, Lewis and Clark and Gallatin Forests are also considered unoccupied. These areas include several disjunct mountain ranges in eastern Montana; some are in secondary areas (Big Belts, Little Belts, Castle, Bridger, Crazy, and Elkhorn Mountain ranges) and others are entirely within peripheral areas (Big Snowy, Pryor and Highwood Mountains).

Relationship of proposed action to existing management

For the past six years, the Forest Service has been managing lands in accordance with the Conservation Agreements (U.S. Forest Service and U.S. Fish and Wildlife Service 2000; U.S. Forest Service and U.S. Fish and Wildlife Service 2005; U.S. Forest Service and U.S. Fish and Wildlife Service 2006). According to the Conservation Agreements, most projects with adverse effects on lynx would be deferred until Plans were revised or amended, and the recommendations of the LCAS would be considered when amending Plans. Because the lands in the action area have been managed according to the Conservation Agreements for six years, the Forest Service considered management consistent with the Conservation Agreements to be the baseline condition (see BA).

This amendment would change management from baseline management because it would allow Forest Service actions with adverse effects on lynx to proceed in occupied habitat, after appropriate consultation. However, compared to direction under the current Conservation Agreements, the direction to be applied in occupied habitat, including all core area within the NRLA area, includes proactive management objectives with implementing standards and guidelines intended to promote the conservation of lynx and lynx habitat. The proposed amendment would allow some adverse effects to lynx primarily from the following: 1) fuels management projects that are exempted from vegetative management standards inside wildland-urban interface (WUI) in up to six percent of occupied lynx habitat; and 2) exceptions to vegetative standards for some pre-commercial thinning projects that are conducted for fuels treatment or other resource benefits (e.g., whitebark pine restoration) in up to 64,320 acres of occupied lynx habitat over a 10-year period (U.S. Forest Service in litt. 2007b)(Appendix D-Table 1). In unoccupied lynx habitat, existing Plan direction would continue. The amendment could be considered in such areas, but the existing Forest Plan direction would allow actions that could negatively impact unoccupied lynx habitat.

Some LCAS standards were changed to guidelines because the Forest Service considers guidelines more appropriate for those risk factors the Service determined were not negatively affecting the contiguous U.S. lynx DPS as a whole (March 24, 2000; 65 FR 16052), and therefore the Forest Service determined that that level of constraint [implied by standards] is not warranted (R. Smith, pers. comm. 2006). The Service notes that where we determined in our finding that certain risk factors did not negatively affect the lynx DPS, the risks may impart adverse affects to individual lynx depending upon site specific conditions. Further, the Forest Service modified the some standards from that in the LCAS to include the exemptions and exceptions noted above or to clarify the intent of a standard. Finally, in some cases there was a lack of scientific or reliable information to indicate that certain standards were needed in most cases to avoid adverse effects to lynx (see Appendix C).

Guidelines would be implemented in most cases (BA; U.S. Forest Service 2004). The 2004 DEIS defines a “guideline” as follows: “A guideline is a particular management action that should be used to meet an objective found in a land management plan. The rationale for deviations may be documented, but amending the plan is not required.” A standard is defined as follows: “A standard is a required action in a land management plan specifying how to achieve an objective or under what circumstances to refrain from taking action. A plan must be amended to deviate from a standard.” The BA indicates that guidelines would be adhered to in most cases, except where compelling reasons, such as the protection of other species at risk or protection of public safety, are an issue. Finally, the amendment includes a vegetation standard to conserve multi-storied forested stands, which was not included in the LCAS.

Elements of the Proposed Action

The following direction, objectives and implementing standards and guidelines, would apply to the areas of 12 National Forests that encompass occupied lynx habitat (about 12.2 million acres) (see Table 1). For those areas on National Forests that have lynx habitat that is currently unoccupied (about 6.3 million acres), the direction would be applied if and when lynx are determined to occupy the areas. In the meantime, the direction may be “considered”. An area would be determined “occupied” if it met the criteria in the amendment to the Canada Lynx Conservation Agreement (US Forest Service and U.S. Fish and Wildlife Service 2006), which are two verified lynx reports since 1999, and/or evidence of lynx reproduction. In both occupied and unoccupied lynx habitat in nondevelopmental allocations, management actions such as vegetation alterations would be substantially curtailed, if they occur at all, and natural processes and disturbances would predominate (Appendix F). Refer to Appendix C for the complete proposed action for occupied lynx habitat (Alternative F).

Habitat Connectivity The Forest Service proposes to require all new or expanded permanent developments and vegetation management activities to maintain or enhance habitat connectivity. This direction is designed to enhance the ability of lynx to move freely across the landscape during periods of dispersal or food scarcity and reduce mortality risk associated with highways. The proposed action includes an objective to pursue conservation easements, land exchanges, and other actions to reduce adverse impacts on lynx and lynx habitat within linkage zones

(LINK O1 and HU O6). The proposed action includes two standards and two guidelines for managing lands to implement this objective by considering lynx movement within and between blocks of suitable habitat:

- New or expanded permanent developments and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area (**All S1**).
- When highway or forest highway construction or reconstruction is proposed in linkage areas, identify potential highway crossings (**LINK S1**).
- National Forest Service lands should be retained in public ownership (**LINK G1**).
- Livestock grazing in shrub-steppe habitats should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes (**LINK G2**).

Vegetation Management

Timber harvest and thinning

Vegetation management in the NRLA area includes timber harvest, pre-commercial thinning, and commercial thinning. Within lynx habitat, the Forest Service proposes to limit vegetation management that changes habitat to a “stand initiation structural stage” (described in the LCAS as “lynx habitat in unsuitable condition”) to within no more than 30 percent of the lynx habitat within an LAU, with the exception of fuels management projects within the WUI, which are exempted from this standard (see details in *Fuels Management* section below).

The Forest Service conducts and/or permits silvicultural thinning to reduce dense horizontal structure and encourage growth of remaining trees. Pre-commercial thinning projects during the stand initiation stage reduce the quality of snowshoe hare habitat and thus reduce prey for lynx. Within occupied lynx habitat, the Forest Service proposes to not conduct pre-commercial thinning, with exceptions for specific circumstances. Within the NRLA area approximately 21,870 to 64,320 acres (2,100 to 6,420 acres/year) of lynx habitat may be pre-commercially thinned under these special circumstances over the next 10 years, primarily to benefit other resources such as whitebark pine (see Appendix D, Table 1). If full funding is obtained, the amount constitutes an increase of more than three times over the current average of about 2,190 acres per year. Based upon recent information from Montana (1994-1998) however, the Forest Service has received about 35 percent of the funding needs identified (note historic averages in , Appendix D, Table1). Although funding for pre-commercial thinning could increase, it is unlikely that full funding to treat all acres identified would be realized.

Thinning or reduction of the understory of older multi-story structural stages would also reduce the quality of snowshoe hare habitat and thus reduce lynx prey and foraging habitat. Within lynx habitat, the Forest Service proposes to not conduct projects that reduce snowshoe hare habitat in multi-storied mature or late successional forests that provide snowshoe hare habitat, with exceptions for specific circumstances during salvage operations and research.

The Forest Service proposes to manage vegetation and fuels within the NRLA area according to the following standards and guidelines to minimize the effects of vegetation management on lynx and lynx habitat:

- Unless a broad scale assessment has been completed that substantiates different historic levels of stand initiation structural stages limit disturbance in each LAU as follows: if more than 30 percent of the lynx habitat in an LAU is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat no additional habitat may be regenerated by vegetation management projects (**VEG S1**).
- Timber management projects shall not regenerate more than 15 percent of lynx habitat on NFS or BLM lands in an LAU in a ten-year period (**VEG S2**). *Note:* The Forest Service defines “regeneration” as cutting trees and creating an entire new age class; an even-age harvest. The major methods are clearcutting, seed tree, and shelterwood cuts (R. Smith, pers. comm. 2006).
- Pre-commercial thinning projects that reduce snowshoe hare habitat may occur from the stand initiation structural stage until the stands no longer provide winter snowshoe hare habitat only: 1) within 200 feet of administrative sites, dwellings, or outbuildings; or 2) for research studies or genetic tree tests evaluating genetically improved reforestation stock; or 3) based on new information that is peer reviewed and accepted by the regional/state levels of the Forest Service and FWS, where a written determination states: a) that a project is not likely to adversely affect lynx; or b) that a project is likely to have short term adverse effects on lynx or its habitat, but would result in long-term benefits to lynx and its habitat.; or 4) for conifer removal in aspen, or daylight thinning around individual aspen trees, where aspen is in decline; or 5) for daylight thinning of planted rust-resistant white pine where 80% of the winter snowshoe hare habitat is retained; or 6) to restore whitebark pine (**VEG S5**).
- Vegetation management projects that reduce snowshoe hare habitat in multi-story mature or late successional forests may occur only: within 200 feet of administrative sites, dwellings, outbuildings, recreation sites, and special use permit improvements, including infrastructure within permitted ski area boundaries; or for research studies or genetic tree tests evaluating genetically improved reforestation stock; or for incidental removal during salvage harvest (e.g. removal due to location of skid trails). *Note:* Timber harvest is allowed in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover (e.g. uneven age management systems could be used to create openings where there is little understory so that new forage can grow)(**VEG S6**).
- Vegetation management projects should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available. Priority should be given to stem-exclusion, closed-canopy structural stage stands for lynx or their prey (e.g. mesic, monotypic lodgepole stands). Winter snowshoe hare habitat should be near denning habitat (**VEG G1**).
- Habitat for alternate prey species, primarily red squirrel, should be provided in each LAU (**VEG G5**).
- Fuel treatment projects in the WUI as defined in HFRA should be designed considering standards VEG S1, S2, S5 and S6 to promote lynx conservation (**VEG G10**)
- Denning habitat should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads, or large piles of small wind thrown trees (“jack-strawed” piles). If denning habitat appears to be lacking in the LAU, then projects should be designed to retain some coarse woody debris, piles, or residual trees to provide denning habitat in the future (**VEG G11**).

Fuels treatment projects within the WUI are exempted from the vegetation standards described above. The Forest Service added the following language to **VEG S1, S2, S5, and S6**, (described above) to limit the acreage of lynx habitat that could be treated by fuels management projects that may adversely affect lynx (described below):

- Cumulative total of fuel treatment projects within the WUI that do not meet the vegetation standards shall not affect more than six percent of lynx habitat per Forest in the amendment area. For fuel treatment projects within the WUI follow guideline **VEG G10**.

Fuels management

Fire management includes wildland fire use, prescribed fire, and mechanical treatment of fuels. It is generally acknowledged that in the Northern Rocky Mountains fire suppression has altered historic vegetative patterns. This effect has been most pronounced within vegetation communities that have fire regimes that are of low intensity or of mixed severity. Many of these are drier community types and are not considered lynx habitat. Spruce-fir habitats (lynx habitat) appear to have been little or less affected by fire suppression because the fire regimes within this type tend to be stand replacing events occurring at low frequencies (i.e. every 100 years or more) (Agee 2000). Depending on the moisture regime, large stand-replacing fires within lynx habitat may produce dense regenerating growth, providing high quality snowshoe hare foraging habitat after approximately 10 to 30 years. This vegetative condition provides high quality snowshoe hare habitat, but mature forests are also very important as winter foraging habitat (John Squires, U.S.D.A. Intermountain Research Station, pers. comm. 2005; McKelvey et al. 2000d).

The Forest Service has been giving increased attention to fuel management within the WUI as directed by the Healthy Forest Restoration Act (HFRA). The Federal Register defines a community at risk as areas with greater than 28 people per square mile. The Forest Service uses the definition of WUI as found in the HFRA, which is variable in extent depending upon the terrain and other factors. In order to determine effects, the Forest Service estimated the WUI zone as encompassing an area generally extending an average of 1 mile from a community at risk, but can vary based upon the specific community. The Forest Service projects that the cumulative total of fuel treatment projects within the combined WUI areas, as implemented under the proposed action, will not affect more than 6 percent of all lynx habitat per Forest within the amendment area. Fuels management projects are proposed to occur wherever necessary, both inside and outside the WUI. The Forest Service anticipates that the majority of these projects would occur within the WUI but would need flexibility in some cases.

Standards **VEG S1, S2, S5, and S6** apply to fuels management projects that would occur outside the WUI, as described in the following amendment language:

- Standard **VEG S1** applies to all vegetation and fuel treatment projects outside the wildland urban interface as defined by HFRA.
- Standard **VEG S2** applies to all vegetation and fuel treatment projects that use timber harvest to achieve objectives, outside the wildland urban interface as defined by HFRA.
- Standard **VEG S5** applies to precommercial thinning projects that use precommercial thinning to achieve objectives, outside the wildland urban interface as defined by HFRA.

- Standard **VEG S6** applies to all vegetation and fuel treatment projects outside the wildland urban interface as defined by HFRA.

The following language immediately follows in each of the above standards to limit the acreage treated by exceptions for fuels management:

- ...Cumulative total of fuel treatment projects within the WUI that do not meet the vegetation standards shall not exceed six percent of mapped lynx habitat per Forest in the amendment area. For fuel treatment within the WUI follow guideline **VEG G10**.

A maximum of six percent of lynx habitat within WUI areas across the NRLA area could be treated through fuel treatment projects that would not meet the standards. This limit was derived from approximating the percent of mapped lynx habitat that falls within the cumulative area of the WUIs (generally extending an average of 1 mile from a community at risk). In order to meet the goals of community protection in the Healthy Forest Restoration Act, the Forest Service is assuming that the entire WUI *could* be treated under the amendment. However, the need to treat the entire area within the WUI, equaling six percent, as well as obtaining the funding necessary to do so, is unlikely (BA). Therefore, to estimate the amount of area most likely to be treated, as compared to the six percent within the WUI, the Forest Service obtained actual estimates of needed treatments from each Region to determine the acreage more likely to be treated within the WUI within the NRLA (for more information, see Appendix E). These estimates are shown in Table 1. Note that the total amount of lynx habitat likely to be treated during the 10 years this biological opinion is in effect within the amendment area is approximately 1.8 percent, substantively less than the 6 percent maximum proposed by the Forest Service. “Treatments” include all management activities that could be used to conduct fuel management, including prescribed fire, wildland fire use, thinning, and timber harvest.

Table 1. Acres of occupied lynx habitat likely to be treated to reduce hazardous fuels in the NRLA area (from U.S. Forest Service in litt. 2007 – Appendix E).

| Area | Acres Treated/Decade (% of Lynx Habitat) |
|---|--|
| Within the 1-mile WUI zone (> 28 people mi ²) | 170,270 (1.4%) |
| Outside 1 mile WUI zone | 392,860 (3.2%) |
| Total | 563,130 (4.6%) |

In addition to the standards and exceptions listed above for vegetation management, the Forest Service proposes to apply the following guidelines to further minimize the effects of the proposed action on lynx:

- Prescribed fire activities should not create permanent travel routes that facilitate snow compaction. Constructing permanent firebreaks on ridges or saddles should be avoided. (**VEG G4**).

Roads and Highways Table 2 displays a breakdown of road categories and past and current planned activities within lynx habitat in the NRLA. Appendix D, Table 7 displays the projections per occupied and unoccupied Forests.

Table 2. Categories of road management activities within lynx habitat in the NRLA area (U.S. Forest Service in litt. 2007-Appendix D).

| Category | Miles |
|--|---------|
| Maintained for high clearance vehicles (Maintenance level 2) | 8,664.0 |
| Maintained for low clearance vehicles (Maintenance levels 3-5) | 6,929.0 |
| Roads of 2+ lanes which have been paved within past 10 years | 14.7 |
| Roads of 2+ lanes which are planned to be paved during the next 5 years | 45.4 |
| Roads of 1 lane which have been paved for environmental concerns over the past 5 years | 2.0 |
| Roads of 1 lane which are planned to be paved for environmental concerns over the next 5 years | 2.0 |
| Roads constructed during past 5 years that remain open | 14.4 |
| Roads planned to be constructed that would remain open over next 5 years | 4.9 |
| Roads planned to be upgraded over the next 5 years | 237.4 |
| Roads planned on ridge tops that would remain open | 7.0 |

The Services's final rule listing the lynx determined that forest roads were not known to negatively impact resident lynx populations (March 24, 2000; 65 FR 160052). The proposed action includes the following guidelines that would reduce the potential effects of forest roads on lynx and lynx habitat:

- Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways or forest highways across federal land. Methods could include fencing, underpasses or overpasses (**ALL G1**).
- Methods to avoid or reduce effects to lynx should be used in lynx habitat when upgrading unpaved roads to maintenance levels 4 or 5, if the result would be increased traffic speeds and volumes, or a foreseeable contribution to increases in human activity or development (**HU G6**).
- New permanent roads should not be built on ridge-tops and saddles, or in areas identified as important for lynx habitat connectivity. New permanent roads and trails should be situated away from forested stringers (**HU G7**).
- Cutting brush along low-speed, low-traffic-volume roads should be done to the minimum level necessary to provide for public safety (**HU G8**).
- On new roads built for projects, public motorized use should be restricted. Effective closures should be provided in road designs. When the project is over, these roads should be reclaimed or decommissioned, if not needed for other management objectives (**HU G9**).

Recreation The Forest Service proposes to manage approximately 13,375 miles of designated and groomed snowmobile/cross-country ski routes within the NRLA area; 7,975 miles (60 percent) of that total are within mapped lynx habitat (U.S. Forest Service in litt. 2007)(Appendix D). Twenty-eight existing downhill and cross-country ski areas encompass 21,259 acres in lynx habitat. Ten of these areas have plans for expansion and one new ski area is planned within lynx habitat. The effects of nine of these expansions were previously addressed in a biological opinion (U.S. Fish and Wildlife Service 2001). The remaining two would impact a total of 1,000 acres (R. Smith, pers. comm. 2006). The NRLA contains 2,722 special use permits and

agreements. Three hundred and fifty-nine of those permits and agreements are for winter activities; of those, 338 (94%) are within lynx habitat.

The Service's final rule listing the lynx determined there was no evidence that competition from coyotes, bobcats, or mountain lions, as facilitated by compacted snow trails, was negatively affecting lynx at a population-level scale (March 24, 2000; 65 FR 16052). The Forest Service proposes to implement the following guidelines to minimize the potential effects of the proposed action on lynx and lynx habitat:

- Developed Recreation:
 - When developing or expanding ski areas, provisions should be made for adequately sized inter-trail islands that include coarse woody debris, so winter snowshoe hare habitat is maintained (**HU G1**)
 - When developing or expanding ski areas, nocturnal foraging should be provided consistent with the ski area's operational needs, especially where lynx habitat occurs as narrow bands of coniferous forest across mountain slopes (**HU G2**).
 - Recreation developments and operations should be planned in ways that both provide for lynx movement and maintain the effectiveness of lynx habitat (**HU G3**).
 - When developing or expanding ski areas and trails, access roads and lift termini should be located to maintain and provide lynx diurnal security habitat (**HU G10**).

- Winter Recreation Designated over-the-snow routes, or designated play areas, should not expand outside baseline areas of consistent snow compaction, unless designation serves to consolidate use and improve lynx habitat. This guideline does not apply inside permitted ski area boundaries, to winter logging, to rerouting trails for public safety, to accessing private inholdings, or to access regulated by guideline **HU G12** (**HU G11**).

Minerals

Leaseable minerals

The Forest Service manages approximately 820,000 acres under lease for oil and gas with additional acreage pending for lease. Only three wells have been drilled on public lands within lynx habitat during the past ten years (U.S. Forest Service in litt. 2007)(Appendix D); all have been plugged and abandoned. Recent estimates of foreseeable oil and gas development suggest that approximately 39 wells may be drilled within lynx habitat in the NRLA area. In addition, one exploratory well is expected to be drilled. About 75 percent of the wells would occur in occupied lynx habitat.

Locatable minerals (gold, silver, copper, etc.) and mineral materials (gravel, rock, sand)

During FY 2000, 142 Plans of Operations and 550 Notices of Intent to operate were processed on the Forests involved in the NRLA effort (BA). Over the past 15 years (1990 – 2004) approximately one-third of the Plans of Operation and Notices of Intent were located in lynx habitat. Most current activities are related to maintenance of existing facilities. Most disturbances associated with locatable minerals are less than 20 acres in size, although there are five large (100 to 600 acres) operations on National Forest System lands within lynx habitat in the NRLA area. Five mineral operations exist within the entire NRLA (see table 6, Appendix D for break out of occupied and unoccupied Forests). Two of these are operating and the other

three are in the care and maintenance or reclamation phases. Four to nine may be developed within the next decade. The potential for future mineral discovery is considered low (BA).

The Forest Service manages approximately 2,600 active mineral material pits within the NRLA area (BA). Of these, about two to three percent (52-78) of the sites are within lynx habitat. Currently only one site within lynx habitat has winter operations. Sites are typically from less than one acre to five acres in size.

We found no evidence that mineral development was a factor threatening lynx, therefore, we did not address mineral development in the final listing rule (March 24, 2000; 65 FR 16052). The proposed action contains the following guidelines designed to minimize the impacts of minerals-related activities on individual lynx and lynx habitat:

- For mineral and energy development sites and facilities, remote monitoring should be encouraged to reduce snow compaction (**HU G4**).
- Manage human activities, such as special uses, mineral and oil and gas exploration and development, and placement of utility transmission corridors, to reduce impacts on lynx and lynx habitat (**HU G5**).
- Methods to avoid or reduce effects to lynx should be used in lynx habitat when upgrading unpaved roads to maintenance levels 4 or 5, if the result would be increased traffic speeds and volumes, or a foreseeable contribution to increases in human activity or development (**HU G6**).
- On new roads built for projects, public motorized use should be restricted. Effective closures should be provided in road designs. When the project is over, these roads should be reclaimed or decommissioned, if not needed for other management objectives (**HU G9**).
- Winter access for non-recreation special uses, and mineral and energy exploration and development, should be limited to designated routes or designated over-the-snow routes (**HU G12**).

Grazing The Forest Service manages all or portions of 1,420 allotments within lynx habitat in the NRLA area. Table 2, Appendix D, displays these allotments by unoccupied and occupied Forests. The extent of grazing on these lands is not expected to increase over the time frame addressed in this biological opinion. If anything, a decrease in grazing of 5 to 10 percent per year within lynx habitat is possible (Terry Nevius, U.S. Forest Service, pers. comm. 2007). Eighty-five percent of these allotments are managed under some type of aquatic/riparian management strategy (INFISH, PACFISH, etc.) that have some objectives that are similar to those identified in the LCAS for lynx habitat management. Because the Plan amendments are designed to incorporate only new management direction, management direction contained in the LCAS that was redundant with existing management direction is not part of this amendment. Further, measures contained in other Plan direction or agreements that have riparian management strategies also provide benefits to lynx (see BA pages 44 and 45).

We found no evidence that grazing was a factor threatening lynx, therefore, grazing was not addressed in the final listing rule (March 24, 2000; 65 FR 16052). The proposed action includes four new guidelines for grazing management practices that provide for the regeneration of trees, shrubs and aspen clones in lynx habitat. These guidelines are:

- In fire- and harvest-created openings, livestock grazing should be managed so impacts do not prevent shrubs and trees from regenerating (**GRAZ G1**).
- In aspen stands, livestock grazing should be managed to contribute to the long-term health and sustainability of aspen. (**GRAZ G2**)
- In riparian areas and willow carrs, livestock grazing should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes (**GRAZ G3**).
- In shrub-steppe habitats, livestock grazing should be managed in the elevation ranges of forested lynx habitat in lynx analysis units (LAU), to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes (**GRAZ G4**).

STATUS OF THE SPECIES

The lynx was added to the list of threatened species on March 24, 2000 (65 FR 16052). We concluded that the single factor threatening the contiguous United States DPS of lynx was the inadequacy of existing regulatory mechanisms, specifically the lack of guidance for conservation of lynx in National Forest Land and Resource Management Plans and BLM land Use Plans. On July 3, 2003, we published a clarification of findings published in the Federal Register (68 FR 40076) determining that threatened species designation was appropriate for the lynx. We published a final rule to designate critical habitat for the Canada lynx in the contiguous United States on November 9, 2006 (71 FR 6600766008). The final critical habitat designation did not include Forest Service lands that are covered by the proposed amendments. Therefore, this biological opinion will not analyze effects to critical habitat, as none will be affected. The Service's various listing rules provide a good resource for a more thorough discussion of life history information on lynx that is summarized below.

Species Description

The lynx is a medium-sized cat with long legs; large, well-furred paws; long tufts on the ears; and a short, black-tipped tail (McCord and Cardoza 1982). The winter pelage of the lynx is dense and has a grizzled appearance with grayish-brown mixed with buff or pale brown fur on the back, and grayish-white or buff-white fur on the belly, legs, and feet. Summer pelage of the lynx is more reddish to gray-brown (Koehler and Aubry 1994). Adult males average 22 pounds in weight and 33.5 inches in length (head to tail), and females average 19 pounds and 32 inches (Quinn and Parker 1987). The lynx's long legs and large feet make it highly adapted for hunting in deep snow.

Home Range and Dispersal

Individual lynx maintain large home ranges (reported as generally ranging between 12 to 83 square miles (Koehler 1990; Aubry et al. 2000; Squires and Laurion 2000; Squires et al. 2004b; Vashon et al. 2005a). The size of lynx home ranges varies depending on abundance of prey, the animal's gender and age, season, and the density of lynx populations (Koehler 1990; Poole 1994; Slough and Mowat 1996; Aubry et al. 2000; Mowat et al. 2000; Vashon et al.

2005a). When densities of snowshoe hares decline, for example, lynx enlarge their home ranges to obtain sufficient amounts of food to survive and reproduce. Preliminary research supports the hypothesis that lynx home ranges at the southern extent of the species' range are generally large compared to those in the core of the range in Canada (Koehler and Aubry 1994; Apps 2000; Squires and Laurion 2000). In northwestern Montana, female home ranges average 34 square miles while male's average 83 square miles (Squires et al. 2004b).

Lynx are highly mobile and have a propensity to disperse long distances, particularly when prey becomes scarce (Mowat et al. 2000). Lynx also make long distance exploratory movements outside their home ranges (Aubry et al. 2000; Squires et al. 2001; Moen et al. 2004). Areas or habitats used by lynx during dispersal or exploratory movements are poorly understood at this time. Evidently lynx are able to traverse expanses of diverse habitat types and conditions during their movements. Dispersing lynx may colonize suitable but unoccupied habitats, augment existing resident populations, or disperse to unsuitable or marginal habitats where they cannot survive. Lynx are capable of dispersing extremely long distances (Mech 1977; Washington Department of Wildlife 1993); for example, a male was documented traveling 370 miles (Brainerd 1985). Lynx disperse primarily when snowshoe hare (*Lepus americanus*) populations decline (Ward and Krebs 1985; Koehler and Aubry 1994; O'Donoghue et al. 1997; Poole 1997). Subadult lynx disperse even when prey is abundant (Poole 1997), presumably as an innate response to establish home ranges.

During the early 1960's and 1970's, numerous lynx were documented in atypical habitat, such as in North Dakota. In those years, harvest returns indicated unprecedented cyclic lynx highs for the 20th century in Canada (Adams 1963; Harger 1965; Mech 1973; Gunderson 1978; Thiel 1987; McKelvey et al. 2000b). Many of these unusual observations were probably dispersing animals that either were lost from the population or later returned to suitable habitat.

Cover is important to lynx when searching for food (Brand et al. 1976). Lynx have been observed (via snow tracking) to avoid large openings (Koehler 1990; Staples 1995) during daily movements within the home range, seeming to prefer to move through continuous forest, using the highest terrain available such as ridges and saddles (Koehler 1990; Staples 1995). Lynx often hunt along edges (Mowat et al. 2000). Kesterson (1988) and Staples (1995) reported that lynx hunted along the edges of mature stands within a burned forest matrix, and Major (1989) found that lynx hunted along the edge of dense riparian willow stands. In Montana, lynx preferentially foraged in spruce-fir forests with high horizontal cover, abundant hares, and large diameter trees during the winter (Squires et al. 2006). Lynx tended to avoid sparse, open forest and forest stands dominated by small-diameter trees during the winter.

The primary factor driving lynx behavior and distribution is the distribution of snowshoe hare, their primary prey. Snowshoe hares prefer boreal forest stands that have a dense horizontal understory to provide food, cover and security from predators. Snowshoe hares feed on conifers, deciduous trees and shrubs (Hodges 2000b). Snowshoe hare density is correlated to understory (horizontal) cover between approximately 3 to 10 feet above the ground or snow level (Hodges 2000b). Habitats most heavily used by snowshoe hares are stands with shrubs, stands that are densely stocked, and stands at ages where branches have more lateral cover (Hodges 2000b). Generally, earlier successional forest stages support a greater density of horizontal understory

and more abundant snowshoe hares (Buehler and Keith 1982; Wolfe et al. 1982; Koehler 1990; Hodges 2000b; Homyack 2003; Griffin 2004). Mature, multistoried stands also can have adequate dense understory to support abundant snowshoe hares (Hodges 2000a; Hodges 2000b; Griffin 2004, Squires et al. 2006).

Diet

Snowshoe hares are the primary prey of lynx, comprising 35 to 97 percent of the diet throughout the range of the lynx (Koehler and Aubry 1994). Other prey species include red squirrel (*Tamiasciurus hudsonicus*), grouse (*Bonasa umbellus*, *Dendragapus* spp., *Lagopus* spp.), flying squirrel (*Glaucomys sabrinus*), ground squirrel (*Spermophilus parryii*, *S. Richardsonii*), porcupine (*Erethizon dorsatum*), beaver (*Castor canadensis*), mice (*Peromyscus* spp.), voles (*Microtus* spp.), shrews (*Sorex* spp.), fish, and ungulates as carrion or occasionally as prey (Saunders 1963a; van Zyll de Jong 1966; Nellis et al. 1972; Brand et al. 1976; Brand and Keith 1979; Koehler 1990; Staples 1995; O'Donoghue et al. 1998). The primary winter prey species of lynx in Colorado are snowshoe hare and red squirrel, with other mammals and birds forming a minor part of the winter diet (CDOW 2004). Winter food items in Montana included snowshoe hare (96 percent), red squirrel and grouse (Squires and Ruggiero, in press).

During the cycle when hares become scarce, the proportion and importance of other prey species, especially red squirrel, increases in the diet (Brand et al. 1976; O'Donoghue et al. 1998; Apps 2000; Mowat et al. 2000). However, a diet of red squirrels alone might not be adequate to ensure lynx reproduction and survival of kittens (Koehler 1990).

Most research has focused on the winter diet. Summer diets are poorly understood throughout the range of lynx. Mowat et al. (2000) reported through their review of the literature that summer diets have less snowshoe hare and more alternate prey species, possibly because of a greater availability of other species.

In northern regions, when hare densities decline, the lower quality diet causes sudden decreases in the productivity of adult female lynx and decreased survival of kittens, which causes the numbers of breeding lynx to level off or decrease (Nellis et al. 1972; Brand et al. 1976; Brand and Keith 1979; Poole 1994; Slough and Mowat 1996; O'Donoghue et al. 1997). Relative densities of snowshoe hares at southern latitudes are generally lower than those in the north, and differing interpretations of the population dynamics of southern populations of snowshoe hare have been proposed (Hodges 2000b).

Snowshoe hares have evolved to survive in areas that receive deep snow (Bittner and Rongstad 1982). Primary forest types that support snowshoe hare are subalpine fir, Englemann spruce, Douglas fir, and lodgepole pine in the western United States, and spruce/fir, pine, and deciduous forests in the eastern United States (Hodges 2000b). Within these habitat types, snowshoe hares prefer stands of conifers with shrub understories that provide forage, cover to escape predators, and protection during extreme weather (Wolfe et al. 1982; Monthey 1986; Koehler and Aubrey 1994). Hares' use of habitat is correlated with understory cover (Hodges 2000a). Early successional forest stages generally have greater understory structure than do mature forests and therefore support higher hare densities (Hodges 2000a, b). Mature forests also provide snowshoe

hare habitat as openings are created in the canopy when trees succumb to disease, fire, wind, ice, or insects, and the understory develops (Squires et al. 2006). In northwest Montana, connectivity of dense patches of boreal forests interspersed with open habitat, within the forest matrix benefited snowshoe hares (Ausband and Baty 2005).

Den Site Selection

Lynx use a variety of types of large woody debris, such as downed logs, root wads, and windfalls, to provide denning sites with security and thermal cover for kittens (McCord and Cardoza 1982; Koehler 1990; Koehler and Brittell 1990; Mowat et al. 2000; Squires and Laurion 2000; U.S. Fish and Wildlife Service, in litt. 1999; Squires et al. 2006; Merrill and Schenk 2006; Mark McCollough, U.S. Fish and Wildlife Service, pers. comm. 2007). During the first few months of life, kittens are left alone at these sites when the female lynx hunts. Downed logs and overhead cover provide protection of kittens from predators, such as owls, hawks, and other carnivores during this period.

The age of the forest stand does not seem as important for denning habitat as the amount of horizontal structure available, e.g. downed, woody debris (Mowat et al. 2000; M. McCollough, pers. comm. 2007), which provides hiding cover and shelter for kittens. Den sites may be located within older regenerating stands (>20 years since disturbance) or in mature conifer or mixed conifer-deciduous (typically spruce/fir or spruce/birch) forests. In Montana, lynx selected den sites with higher horizontal cover than elsewhere in the animal's home range (Squires et al. 2006). Seventy-three percent of lynx dens were found in mature, mesic forests. Dens were also located in regenerating mesic forests (18 percent) and boulder fields (7 percent). In Washington, lynx used *Pinus contorta* (lodgepole pine), *Picea* spp. (spruce), and *Abies lasiocarpa* (subalpine fir) forests older than 200 years with an abundance of downed woody debris for denning (Koehler 1990). A den site in Wyoming was located in a mature subalpine fir/ lodgepole pine forest with abundant downed logs and a high amount of horizontal cover (Squires and Laurion 2000). In the northeast United States, lynx dens were found in a several stand types including softwood mid/late regeneration, mature forest mixed regeneration, mature softwood, other regeneration, and hardwood/softwood mid/late regeneration. The structural components of lynx den sites are common features in managed (logged) and unmanaged (spruce budworm damaged areas, wind-throw) stands. Tip-up mounds (root wads) were the most common predictor of den sites (M. McCullough, pers.comm. 2007). A key component for suitable lynx denning habitat appears to be horizontal structural.

Denning habitat in or near foraging habitat is likely to be most functional and selected by females. The hunting range of females is restricted at the time of parturition, and their need to feed kittens requires an abundance of prey. Lynx, like other felids, frequently move their kittens until they are old enough to hunt with their mother. Multiple nursery sites are used that provide kittens with overhead cover and protection from predators and the elements. Downed logs and overhead cover throughout the home range provides security when lynx kittens are old enough to travel (Bailey 1974).

Recruitment

Breeding occurs through March and April in the north (Quinn and Parker 1987). Kittens are born in May to June in southcentral Yukon (Slough and Mowat 1996). The male lynx does not help with rearing young (Eisenberg 1986). Slough and Mowat (1996) reported yearling females giving birth during periods when hares were abundant; male lynx may be incapable of breeding during their first year (McCord and Cardoza 1982).

In northern study areas during the low phase of the hare cycle, few if any live kittens are born, and few yearling females conceive (Brand and Keith 1979; Poole 1994; Slough and Mowat 1996). However, Mowat et al. (2000) suggested that in the far north, some lynx recruitment occurs when hares are scarce and this may be important in lynx population maintenance during hare lows.

During periods of hare abundance in the northern taiga, litter size of adult females averages four to five kittens (Mowat et al. 1996). In Montana, the average litter size in the Seeley Lake study area was 2.3 kittens, and 3.2 kittens in the Purcell Mountains (Squires et al. 2006). Koehler (1990) suggested that the low number of kittens produced in northcentral Washington was comparable to northern populations during periods of low snowshoe hare abundance. In his study area, two radio-collared females had litters of three and four kittens in 1986, and one kitten in 1987 (the actual litter size of one of the females in 1987 was not determined) (Koehler 1990). Of the known-size litters in Washington, one kitten survived the first winter. In Wyoming, one female produced four kittens in 1998, but snow tracking indicated that the kittens were not with the female in November and were presumed dead (Squires and Laurion 2000). The same female produced two kittens in 1999.

Mortality

Reported causes of lynx mortality vary between studies. The most commonly reported causes include starvation of kittens (Quinn and Parker 1987; Koehler 1990), and human-caused mortality, mostly fur trapping (Ward and Krebs 1985; Bailey et al. 1986). In a Montana study, 49 lynx mortalities were recorded, 29 percent due to starvation, 18 percent due to trapping or shooting, 31 percent due to predation (primarily mountain lion), and 22 percent due to unknown causes (Squires et al. 2006).

Significant lynx mortality due to starvation has been demonstrated in cyclic populations of the northern taiga, during the first 2 years of hare scarcity (Poole 1994; Slough and Mowat 1996). Various studies have shown that, during periods of low snowshoe hare numbers, starvation can account for up to two-thirds of all natural lynx deaths. Trapping mortality may be additive rather than compensatory during the low period of the snowshoe hare cycle (Brand and Keith 1979). Hunger-related stress, which induces dispersal, may increase the exposure of lynx to other forms of mortality such as trapping and highway collisions (Brand and Keith 1979; Carbyn and Patriquin 1983; Ward and Krebs 1985; Bailey et al. 1986).

Paved roads have been a mortality factor in lynx translocation efforts within historical lynx range. In New York, 18 translocated lynx were killed on highways (Brocke et al. 1990). Translocated animals may be more vulnerable to highway mortality than resident lynx (Brocke et al. 1990). Nine lynx were killed on 2- and 4-lane Colorado highways following their release as part of a reintroduction effort (CDOW 2005).

Other than translocated animals, two highway mortalities have been documented in Wisconsin (Theil 1987) and Minnesota (Don Carlos, unpubl. report 1997). Twelve resident lynx were documented being killed on highways in Canada and Alaska (Staples 1995; Gibeau and Heur 1996; T. Clevenger, pers. comm. 1999; Alexander, pers. comm. 1999). Lynx were killed on graveled, high-speed forest roads in flatter terrain in Maine (Mark McCollough, U.S. Fish and Wildlife Service, pers. comm. 2006).

Predation on lynx by mountain lion, coyote (*Canis latrans*), wolverine (*Gulo gulo*), gray wolf (*Canis lupus*), and other lynx has been confirmed (Berrie 1974; Koehler et al. 1979; Poole 1994; Slough and Mowat 1996; O'Donoghue et al. 1997; Apps 2000; Squires and Laurion 2000; Squires et al. 2006). Squires et al. (2006) reported 15 lynx mortalities in their Montana study area, greater than 90 percent of which were due to mountain lion predation. Observations of such events are rare, and the significance of predation on lynx populations is unknown.

Interspecific Relationships with Other Carnivores

The two major competition impacts to lynx are likely exploitation (competition for food) and interference (avoidance). Several predators (birds of prey, coyote, gray wolf, mountain lion, bobcat, and wolverine) consume snowshoe hares and therefore compete at some level with lynx for prey. Lynx have adaptations for surviving in areas that have cold winters with deep, fluffy snow for extended periods; these adaptations provide lynx a competitive advantage in hunting snowshoe hare over a number of potential competitors, such as bobcats (*Lynx rufus*) or coyotes (*Canis latrans*) (McCord and Cardoza 1982; Buskirk et al 2000a; Ruediger et al. 2000; Ruggiero et al. 2000). In one paper, coyotes were theorized to most likely pose local or regionally important exploitation impacts to lynx, and coyotes and bobcats were deemed to possibly impart important interference competition effects on lynx (Buskirk et al. 2000a). Mountain lions were described as interference competitors, possibly impacting lynx during summer and in areas lacking deep snow in winter, or when high elevation snow packs develop crust in the spring. Long-term snow conditions presumably limit the winter distribution of potential lynx competitors such as bobcats (McCord and Cardoza 1982) or coyotes. Further, bobcats and coyotes have a higher foot load (more weight per surface area of foot), which causes them to sink into the snow more than lynx. Therefore, bobcats and coyotes cannot efficiently hunt in fluffy or deep snow and are at a competitive disadvantage to lynx.

Exploitation competition may contribute to lynx starvation and reduced recruitment. During periods of low snowshoe hare numbers, starvation accounted for up to two-thirds of all natural lynx deaths in the Northwest Territories of Canada (Poole 1994). As described previously, major predators of snowshoe hare include lynx, northern goshawk, great horned owl, bobcat, coyote, red fox, fisher, and mountain lion. In southern portions of snowshoe hare range, predators may

limit hare populations to lower densities than in the taiga (Dolbeer and Clark 1975; Wolff 1980; Koehler and Aubry 1994).

Based on only anecdotal evidence, Parker et al. (1983) discussed competition between bobcats and lynx on Cape Breton Island. Lynx were found to be common over much of the island prior to bobcat colonization. Concurrent with the colonization of the island by bobcats, lynx densities declined and their presence on the island became restricted to the highlands, the one area where bobcats did not become established.

Population Dynamics

Lynx populations in the contiguous United States occur at the southern periphery of a widely-distributed metapopulation whose core is located in the northern boreal forest of central Canada (McCord and Cardoza 1982; Quinn and Parker 1987; McKelvey et al 2000a). The boreal forest of central Canada is vast and extends into Alaska. Lynx in the contiguous United States are at the southern margins, or periphery, of its range. Here, the southernmost extent of the boreal forest that supports lynx occurs in the in the Northeast, western Great Lakes, northern and southern Rockies, and northern Cascades (Ruediger et al. 2000).

The center of North American lynx range is in north-central Canada. Lynx occur in mesic coniferous forests that have cold, snowy winters and provide a prey base of snowshoe hare (Ruggiero et al. 2000). These forests are generally described as boreal forests. Boreal forests provide optimal habitat for snowshoe hares. In North America, the distribution of lynx is nearly coincident with that of snowshoe hares (Bittner and Rongstad 1982; McCord and Cardoza 1982). Lynx survivorship, productivity and population dynamics are closely related to snowshoe hare density in all parts of its range. In the extensive boreal forests of Canada, snowshoe hare densities reach peak densities of roughly four to six hares per hectare (or 1.6 to 2.4 per acre) and decline to about 0.1 to 1 per hectare (0.04 to 0.4 per acre) during cyclic lows (Krebs et al. 1995, Slough and Mowat 1996, Hodges 2000a). A minimum density of snowshoe hares (greater than 0.5 hares per hectare or 1.2 hares per acre (Ruggiero et al. 2000)) distributed across a large landscape is necessary to support survival of lynx kittens and recruitment into and maintenance of a lynx population.

In Canada and Alaska, lynx populations undergo extreme fluctuations in response to the cycling of snowshoe hare, enlarging or dispersing from their home ranges and ceasing the recruitment of young into the population after hare populations decline (Mowat et al. 2000). However, in the contiguous United States, the boreal forest transitions into other vegetation communities and becomes more patchily distributed. As a result, the southern boreal forests generally support lower snowshoe hare densities, hare populations do not appear to be as highly cyclic as snowshoe hares further north, and lynx densities are lower compared to the northern boreal forest. Although snowshoe hare populations in the southern portion of the range (i.e. in the contiguous United States) may fluctuate, they do not show strong, regular population cycles as in the north (Hodges 2000). In the contiguous United States, the degree to which regional local lynx population fluctuations are influenced by local snowshoe hare population dynamics is unclear.

In the contiguous United States, the boreal forest transitions into other vegetation communities and becomes more naturally patchily distributed (fragmented), and provides much less productive hare habitat. Thus lynx populations here are naturally limited by the low availability of snowshoe hares, as suggested by large home range size, high kitten mortality due to starvation, and greater reliance on alternate prey. These characteristics appear to be similar to those exhibited by lynx populations in Canada and Alaska during the low phase of the population cycle (Quinn and Parker 1987, Koehler 1990, Aubry et al. 2000). This is likely due to the inherently patchy distribution of lynx and hare habitat in the contiguous United States and correspondingly lower densities of hares.

In the United States, lynx inhabit conifer and conifer-hardwood habitats that support their primary prey, snowshoe hares. Both timber harvest and natural disturbance processes, including fire, insect infestations, catastrophic wind events, and disease outbreaks, can provide foraging habitat for lynx when resulting understory stem densities and structure provide the forage and cover needs of snowshoe hare (Keith and Surrendi 1971; Fox 1978; Conroy et al. 1979; Wolff 1980; Parker et al. 1983; Litvaitis et al. 1985; Bailey et al. 1986; Monthey 1986; Koehler 1990, 1991; Agee 2000). These characteristics also include a dense, multi-layered understory that maximizes cover and browse at both ground level and at varying snow depths throughout the winter (crown cover within the lower 4.5 meters [15 feet] in order to provide cover and food for snowshoe hares to 2 meters (6 feet) high at maximum snow depths). Despite the variety of habitats and settings, good snowshoe hare habitat has a common denominator – dense, horizontal vegetative cover 1 to 3 meters (3 to 10 feet) above the ground or snow level (Hodges 2000). Multi-layered forests provide this structure, as well as high levels of cover preferred by lynx.

Lynx population dynamics may emanate from the core in Canada to the southern periphery in the contiguous United States, as evidenced by a lagged correlation of lynx trap records and observations in the United States (related to cyclic highs in lynx populations in Canada) (McKelvey et al. 2000b; Mowat et al. 2000). In Canada, the Hudson Bay Company maintained fairly accurate annual lynx pelt data across the range of lynx, which reflect dramatic population cycles. In the Great Lakes Geographic Area, population dynamics in recent decades appear to be strongly driven by immigration from Canada (McKelvey et al. 2000b). However, in other areas and time periods it is not known to what extent the correlation is due to immigration from Canada, population responses to the same factors controlling northern populations, or a combination of the two.

A lack of accurate historic data limits our understanding of lynx population dynamics in the contiguous United States and precludes drawing definitive conclusions about lynx population trends. Historically, formal surveys designed specifically to detect lynx were rarely conducted. Many reports of lynx (e.g., visual observations, snow tracks) have been collected incidentally to other activities, but cannot be used to infer population trends. Long-term trapping data have been used to estimate population trends for various species. In the United States however, trapping returns are strongly influenced by trapper effort, which varies between years and, therefore, may not accurately reflect population trends. Another important problem to note is that trapping records of many States did not differentiate between bobcats and lynx, referring to both as “lynxcats.” Overall, the available data are too incomplete to infer much beyond simple occurrence and distribution of lynx in the contiguous United States (McKelvey et al. 2000b)

Lynx are highly mobile and have a propensity to disperse long distances, particularly when prey becomes scarce (Mowat et al. 2000). Lynx also make long distance exploratory movements outside their home ranges (Aubry et al. 2000; Squires et al. 2001; Moen et al. 2004). Areas or habitats used by lynx during dispersal or exploratory movements are poorly understood at this time. Dispersing lynx may colonize suitable but unoccupied habitats, augment existing resident populations, or disperse to unsuitable or marginal habitats where they cannot survive. Numerous lynx mortality records exist from anomalous habitats or habitats where no records support evidence (either current or historical) of a reproducing population (McKelvey et al. 2000a). Many of these records correspond to post-population peaks in Canada, with some lag time for immigration (McKelvey et al. 2000a). We find no evidence of lynx populations becoming established in such areas.

We suspect that some areas in the contiguous United States naturally act as “sources” of lynx (recruitment is greater than mortality) that are able to disperse and potentially colonize other patches (McKelvey et al. 2000a). Other areas may function as “sinks” (mortality is greater than recruitment) where lynx are lost from the overall population. Sink habitats are most likely those places on the periphery of the southern boreal forest where habitat becomes more fragmented and more distant from larger lynx populations. Fluctuations in prey populations may cause some habitat patches to change from being sinks to sources, and vice versa. The ability of naturally dynamic habitat to support lynx populations may change as the habitat undergoes natural succession following natural or manmade disturbances (i.e., fire, clearcutting).

Individual lynx maintain large home ranges (reported as generally ranging between 31 to 216 km² [12 to 83 mi²]) (Koehler 1990; Aubry et al. 2000; Squires and Laurion 2000; Vashon et al. 2005). Thus, a lynx population can only persist in a large boreal forested landscape that contains appropriate forest types, snow depths and high snowshoe hare densities. In the Northeast, lynx were most likely to occur in areas that support deep snow (greater than 268 centimeters [106 inches] annual snowfall) associated with regenerating boreal forests in landscapes 100 square kilometers (40 square miles) or greater in area (Hoving 2001; Hoving et al. 2004). We assume areas with smaller patches of boreal forest are unlikely to provide a sufficient amount of habitat suitable to support a lynx population.

Lynx populations in the contiguous United States seem to be influenced by lynx population dynamics in Canada (Thiel 1987; McKelvey et al. 2000a,c). Many of these populations in Canada are directly interconnected U.S. populations, and are likely a source of emigration into contiguous United States lynx populations. Therefore, we assume that retaining connectivity with larger lynx populations in Canada is important to ensuring long-term persistence of lynx populations in the U.S. We assume that, regionally, lynx within the contiguous United States and adjacent Canadian provinces interact as metapopulations and, therefore, assessments of population viability must be made at this larger scale and not solely based on populations within the contiguous United States.

Based on our examination of historical and recent evidence, lynx habitat and occurrence within the contiguous U.S can be categorized as: 1) core areas, 2) secondary areas, and 3) peripheral areas (U.S. Fish and Wildlife Service 2005). Core areas are those with the strongest long-term

evidence of the persistence of lynx populations within the contiguous United States, having both persistent, verified records of lynx occurrence over time and recent evidence of reproduction.

Status and Distribution

The historical and present range of the lynx north of the contiguous United States includes Alaska and that part of Canada that extends from the Yukon and Northwest Territories south across the United States border and east to New Brunswick and Nova Scotia. In the contiguous United States, lynx historically occurred in the Cascades Range of Washington and Oregon; the Rocky Mountain Range in Montana, Wyoming, Idaho, eastern Washington, eastern Oregon, northern Utah, and Colorado; the western Great Lakes Region; and the northeastern United States region from Maine southwest to New York (McCord and Cardoza 1982; Quinn and Parker 1987). A thorough discussion and interpretation of lynx records through time is found in the Service's final rule ((March 24, 2000, 65 FR 16052) and clarification of our findings (July 2003; 68 FR 40076).

The distribution of lynx in North America is closely associated with the distribution of North American boreal forest (Agee 2000). In Canada and Alaska, lynx inhabit the classic boreal forest ecosystem known as the taiga (McCord and Cardoza 1982; Quinn and Parker 1987; Agee 2000; McKelvey et al. 2000b). The range of lynx extends south from the classic boreal forest zone into the subalpine forest of the western United States, and the boreal/hardwood forest ecotone in the eastern United States (Agee 2000; McKelvey et al. 2000b). Forests with boreal features (Agee 2000) extend south into the contiguous United States along the Cascade and Rocky Mountain Ranges in the west, the western Great Lakes Region, and along the Appalachian Mountain Range of the northeastern United States. Within these general forest types, lynx are most likely to persist in areas that receive deep snow, to which the lynx is highly adapted (Ruggiero et al. 2000b). Lynx are rare or absent from the wet coastal forests of Alaska and Canada (Mowat et al. 2000).

At its southern margins in the contiguous United States, forests with boreal features, or southern boreal forests, become naturally fragmented as they transition into other vegetation types. Southern boreal forest habitat patches are small relative to the extensive northern boreal forest of Canada and Alaska, which constitutes the majority of lynx range. Many southern boreal forest habitat patches within the contiguous United States cannot support resident populations of lynx and their primary prey species.

The complexities of lynx life-history and population dynamics, combined with a general lack of reliable population data for the contiguous United States, make it difficult to ascertain the past or present population status of lynx in the contiguous United States. It is difficult to determine with certainty whether reports of lynx in many States were (1) animals dispersing from northern populations that were effectively lost because they did not join or establish resident populations, (2) animals that were a part of a resident population that persisted for many generations, or (3) a mixture of both resident and dispersing animals.

The final rule determining threatened status for the lynx in the contiguous United States summarized lynx status and distribution across four regions that are separated from each other by

ecological barriers consisting of spans of area lacking lynx habitat (March 24, 2000, 65 FR 16052). These distinct regions are the Northeast, the Great Lakes, the Northern Rocky Mountains/Cascades, and the Southern Rocky Mountains. The recovery outline for the species split these regions into six “core” areas for lynx, with the southern Rocky Mountains area designated as an additional “provisional core” area. While these regions are ecologically unique and discrete, the lynx is associated with only the southern boreal forest in each and, with the exception of the Southern Rocky Mountains Region, each area is geographically connected to the much larger population of lynx in Canada.

The following summarizes status and distribution information of the lynx DPS in the contiguous United States:

Northeast Region (Maine, New Hampshire, Vermont, New York)—Based on an analysis of cover types and elevation zones containing most of the lynx occurrences, McKelvey et al. (2000b) determined that, at the broad scale, most lynx occurrence records in the Northeast were found within the “Mixed Forest-Coniferous Forest-Tundra” cover type at elevations ranging from 250 to 750 meters (820 to 2,460 feet). This habitat type in the northeast United States occurs along the northern Appalachian Mountain range from southeastern Quebec, western New Brunswick, and western Maine, south through northern New Hampshire. This habitat type becomes naturally more fragmented and begins to diminish to the south and west, with a disjunct segment running north-south through Vermont, an extensive patch of habitat in the Adirondacks of northern New York, and with a few more distant and isolated patches in Pennsylvania (see Figure 8.23 in McKelvey et al. 2000b).

In the northeast, information on the presence of lynx was limited at the time of listing in 2000. In 1999, 6 lynx were radio-collared in northern Maine (March 24, 2000; 65 FR 16052). As of 2004, Maine Department of Inland Fisheries and Wildlife had radio-collared 43 lynx and documented 30 litters (Vashon et al. 2005b). Records show lynx to currently be distributed throughout northern Maine (November 9, 2005; 70 FR 68294). Lynx in Maine currently have high productivity; 91 percent of available adult females older than 2 years produced litters averaging 2.83 kittens (Vashon et al. 2005b). This area is the only area in the northeastern region of the lynx’s range within the contiguous United States that currently supports breeding lynx populations and likely acts as a source or provides connectivity for peripheral portions of the lynx’s range in the Northeast.

The preponderance of lynx habitat in this region occurs on private lands in the State of Maine. Federal agencies manage a minor amount of lynx habitat in this region. The White River National Forest has amended or revised its Plan and so addressed in part, on National Forest lands, the major factor threatening the lynx: inadequacy of existing regulatory mechanisms, specifically the lack of guidance for conservation of lynx in National Forest Plans and BLM Plans. The final rule for critical habitat summarizes a number of private land conservation efforts for lynx in the region (November 9, 2006, 71 FR 66009).

Great Lakes Region (Minnesota, Wisconsin, Michigan)—The majority of lynx occurrence records in the Great Lakes Region are associated with the “mixed deciduous-coniferous forest” type (McKelvey et al. 2000b). Within this general forest type, the highest frequency of lynx

occurrences were in the *Acer saccharum* (sugar maple), *Tilia* spp. (basswood), *Pinus banksiana* (jack pine), *P. strobus* (white pine), and *P. resinosa* (red pine) forest types (McKelvey et al. 2000b). These types are found primarily in northeastern Minnesota, northern Wisconsin, and the western portion of Michigan's upper peninsula.

Mixed deciduous-coniferous forest covers an extensive area in this region, but much of this area is considered marginal habitat for lynx because it is a transitional forest type at the edge of the snowshoe hare range. Habitat at the edge of hare range supports lower hare densities (Buehler and Keith 1982) that may not be sufficient to support lynx reproduction. Snow depths within appropriate habitat that allow lynx a competitive advantage over other carnivores (i.e., coyotes) occur only in limited areas in northeastern Minnesota, extreme northern Wisconsin, and Michigan's upper peninsula.

At the time of listing, we were unsure of whether the Great Lakes Region supported resident populations of lynx or if lynx documented in these areas were simply dispersing from Canada (March 24, 2000; 65 FR 16052) (McKelvey et al. 2000b; R. Sando, Minnesota Department of Natural Resources, in litt. 1998). Since that time, numerous lynx have been verified from northeastern Minnesota through DNA analysis, radio- and GPS-collared animals, and documentation of reproduction (November 9, 2005; 70 FR 68294). Northeastern Minnesota is the only area in the Great Lakes region for which we have evidence of recent lynx reproduction; as such, it likely acts as a source or provides connectivity for more peripheral portions of the lynx's range in this region.

The Forest Service in Minnesota manages a preponderance of lynx habitat in this region. All National Forests in the region have amended or revised their Plans, and so addressed in part, on National Forest lands, the primary factor threatening the lynx: inadequacy of existing regulatory mechanisms, specifically the lack of guidance for conservation of lynx in National Forest Plans and BLM Plans. These include the Chippewa, Superior, Hiawatha, and Ottawa National Forests. Voyageurs National Park in Minnesota was designated as lynx critical habitat in 2006. This designation will ensure that lynx habitat within the park will be managed to conserve lynx.

The final rule for critical habitat summarizes other private land conservation efforts for lynx in the region (November 9, 2006, 71 FR 66009).

Northern Rocky Mountain/Cascades Region (Washington, Oregon, Idaho, Wyoming, Utah)—In this region, the majority of lynx occurrences are associated at a broad scale with the “Rocky Mountain Conifer Forest;” within this type, most of the occurrences are in moist Douglas fir (*Pseudotsuga menziesii*) and western spruce/fir forests (McKelvey et al. 2000b). Most of the lynx occurrences are in the 1,500-2,000 meters (4,920-6,560 feet) elevation class (McKelvey et al. 2000b). These habitats are found in the Rocky Mountains of Montana, Idaho, eastern Washington, and Utah, the Wallowa Mountains and Blue Mountains of southeast Washington and northeastern Oregon, and the Cascade Mountains in Washington and Oregon. The majority of verified lynx occurrences in the United States and the confirmed presence of resident populations are from this region. The boreal forest of Washington, Montana, and Idaho is contiguous with that in adjacent British Columbia and Alberta, Canada.

Northwestern Montana and the north Cascades in Washington currently have resident lynx populations, and strong evidence exists to support the presence of resident lynx distributed throughout much of the forest types considered lynx habitat in Montana and Washington (November 9, 2005; 70 FR 68294). Resident lynx populations exist in contiguous habitats in Idaho, Montana and northwestern Wyoming in the Greater Yellowstone Area (e.g., Murphy et al. 2004). Lynx have probably always occurred only intermittently in peripheral areas of Oregon and Utah, although the historical or current presence of resident populations in either of these States has not been confirmed.

The North Cascades, Yellowstone and Glacier National Parks manage substantial amounts of lynx habitat in this region. Lynx occur in all three National Parks. Through National Park Service management, provide lynx habitat that is generally managed in ways that promotes natural ecological processes, which benefits lynx. Glacier National Park provides a large expanse of lynx habitat that is contiguous with lynx habitat in Canada. Of the three Parks, Glacier and North Cascades were determined to meet the habitat criteria requirements for critical habitat, and were designated critical habitat in 2006. This designation will further ensure that lynx habitat within the Parks will be managed to conserve lynx.

The BLM Spokane District in Washington manages lynx habitat. Its Resource Management Plan was modified in 2003 to incorporate the provisions of the LCAS. On November 30, 2006, we completed consultation with the BLM for the revision of their Coeur d'Alene Resource Management Plan in which lynx were addressed. The BLM has not yet published the ROD on the plan revision, but anticipates it will be published this spring. The Cottonwood BLM in southern Idaho is in the process of amending their plan for lynx; they are at the DEIS stage, with a BA and request for consultation expected by early summer. The Missoula BLM district has also amended their plan to abide by the standards and guides in the LCAS.

The Forest Service manages the preponderance of lynx habitat in this region. Through the proposed action, 18 National Forests in the region intend to address in part, on National Forest lands, the primary factor threatening the lynx: inadequacy of existing regulatory mechanisms, specifically the lack of guidance for conservation of lynx in National Forest Plans and BLM Plans. These include the 18 National Forests listed in Appendix A of this document. The Boise, Payette, and Sawtooth National Forests of Idaho have amended or revised their plans to address this factor, as have the Uinta and Wasatch-Cache National Forests in Utah. Region 6 of the Forest Service in Washington intends to address this factor through Forest Plan revision, which has started for the Okanogan-Wenatchee and Colville (all occupied by lynx), and the Malheur, Wallowa-Whitman, Umatilla (unoccupied) National Forests. The Mount Baker National Forest Plan is not yet in revision.

The final rule for critical habitat summarizes other private land conservation efforts for lynx in the region (November 9, 2006, 71 FR 66009). See also the discussion in this biological opinion, under *Cumulative Effects*.

Southern Rocky Mountains Region (Colorado, southeastern Wyoming)—Colorado represents the extreme southern edge of the range of the lynx. A majority of the lynx occurrence records in Colorado and southeastern Wyoming were associated with the “Rocky Mountain Conifer Forest”

type. The occurrences in the Southern Rockies were generally at higher elevations (8,000-12,000 feet) than were all other occurrences in the West (Ruediger et al. 2000).

A resident lynx population likely occurred historically in the Southern Rocky Mountains Region, based on the records of lynx in Colorado and the persistence of contiguous habitat in southeastern Wyoming with the Colorado habitat. This resident population may have been extirpated, which led the Colorado Division of Wildlife to undertake a reintroduction effort that is currently in progress. Due to CDOW's efforts, 218 adult lynx were released between 1999 and 2006. Of these, 93 mortalities have been documented, and the State is currently tracking 82 of the 125 reintroduced lynx still possibly alive. Reproduction has been documented each year since 2003; 116 kittens have been documented (Tanya Shenk, Colorado Division of Wildlife, pers. comm. 2006).

The southern boreal forest of Colorado and southeastern Wyoming is isolated from boreal forest in Utah and northwestern Wyoming by the Green River Valley and the Wyoming basin (Findley and Anderson 1956 in McKelvey et al. 2000b). We believed that these areas likely reduce opportunities for genetic interchange with the Northern Rocky Mountains/Cascades Region and Canada (Halfpenny et al. 1982; Koehler and Aubry 1994). However, although habitats in the Southern Rockies are far from source populations and more isolated, it is still possible that dispersers could arrive in the Southern Rocky Mountains during highs in the population cycle. A number of lynx from the reintroduced population in Colorado have recently dispersed great distances, with occurrences located in Kansas, Nevada, South Dakota, Arizona, Idaho, Nebraska, Montana, Wyoming and New Mexico (T. Shenk, pers. comm. 2007). Thirty-three different individuals were located in Wyoming, seven in Montana and six in Nebraska.. Such information indicates that dispersing lynx are able to traverse long distances across extremely variable terrain.

The Forest Service manages the preponderance of lynx habitat in this region. All National Forests in the region intend to address through amending or revising their Plans, on National Forest lands, the primary factor threatening the lynx: inadequacy of existing regulatory mechanisms, specifically the lack of guidance for conservation of lynx in National Forest Plans and BLM Plans. The Forests are currently preparing a Final Environmental Impact Statement for the Southern Rocky Lynx Amendment is preparing a biological assessment for consultation under section 7(a)2. These include the Medicine Bow, Routt, Arapaho-Roosevelt, Pike and San Isabel, Rio Grande, White River, Grand Mesa, Uncompahgre, Gunnison, and the San Juan National Forests.

Reports from other locations—During the early 1960's, concurrent with an unprecedented cyclic high in Canada, lynx moved into the Great Plains and the Midwest Region of the United States (Gunderson 1978; Mech 1980; DeStefano 1987; South Dakota Natural Heritage Program, in litt. 1994). These records are outside of the southern boreal forests where most lynx occurrences are found (McKelvey et al. 2000b). We consider lynx observations in Nevada, North Dakota, South Dakota, Iowa, Nebraska, Indiana, Ohio, and Virginia to be individuals dispersing subsequent to periods of cyclic high lynx numbers in Canada (Hall and Kelson 1959; Burt 1954 in Brocke 1982; McKelvey et al. 2000b; S. Johnson, Indiana Department of Natural Resources, in litt. 1994; P. Jones, Ohio Department of Natural Resources, in litt. 1994; W. Jobman, U.S. Fish and

Wildlife Service, in litt. 1997; Smithsonian Institute, in litt. 1998). We do not consider these States to be within the contiguous United States range of lynx (65 FR 16052, March 24, 2000).

Recovery Outline

We developed a recovery outline for lynx in the contiguous United States (Service 2005). The purpose of the outline is to serve as an interim strategy to guide recovery efforts until a final recovery plan is completed. The lynx recovery outline presents our current understandings of historical and current lynx distribution, ecology, and population dynamics.

The outline introduces concepts regarding the relative importance of different geographic areas to the persistence of lynx in the contiguous United States, identifying areas as either core, provisional core, secondary or peripheral based on lynx records over time and evidence of reproduction. Six core areas were identified in the recovery outline, along with a provisional core area within the Southern Rockies (Colorado and southern Wyoming). The recovery outline provides four preliminary recovery objectives, which are accompanied by recovery actions needed to attain objectives.

In addition to determining whether an area is occupied by lynx, the Service examined lynx habitat and designated areas according to their known or projected quality and importance in lynx recovery. The lynx recovery outline stratified lynx habitat in the contiguous United States into **core, provisional core, secondary, and peripheral areas**: “Based on our examination of historical and recent evidence, lynx habitat and occurrence within the contiguous U.S can be categorized as: 1) core areas, 2) secondary areas, and 3) peripheral areas. The areas with the strongest long-term evidence of the persistence of lynx populations within the contiguous United States are defined as “**core areas**.” Core areas have both persistent verified records of lynx occurrence over time and recent evidence of reproduction. Six core areas and one “provisional” core area are identified within the contiguous United States. The provisional core area in the Southern Rockies was identified because it contains a reintroduced population. Reproduction has been documented in this introduced population; however, it is too early to determine whether a self-sustaining lynx population will result. Focusing lynx conservation efforts on these core areas will ensure the continued persistence of lynx in the contiguous U.S by addressing fundamental principles of conservation biology”

The recovery outline continues “At this time, the role of areas outside of **core areas** in sustaining lynx populations in the contiguous United States is unclear. The fluctuating nature of lynx population dynamics and the ability of lynx to disperse long distances have resulted in many individual occurrence records outside of core areas, without accompanying evidence of historic or current presence of lynx populations. Areas classified as “**secondary areas**” are those with historical records of lynx presence with no record of reproduction; or areas with historical records and no recent surveys to document the presence of lynx and/or reproduction. If future surveys document presence and reproduction in a secondary area, the area could be considered for elevation to core. We hypothesize that secondary areas may contribute to lynx persistence by providing habitat to support lynx during dispersal movements or other periods, allowing animals to then return to “core areas”. In “**peripheral areas**” the majority of historical lynx records is

sporadic and generally corresponds to periods following cyclic lynx population highs in Canada. There is no evidence of long-term presence or reproduction that might indicate colonization or sustained use of these areas by lynx. However, some of these peripheral areas may provide habitat enabling the successful dispersal of lynx between populations or subpopulations. At this time, we simply do not have enough information to clearly define the relative importance of secondary or peripheral areas to the persistence of lynx in the contiguous United States”.

A discussion of the how the proposed action relates to the recovery outline can be found later in this document, under the *Effects of the Action* section.

Analysis of the Species Likely to be Affected

Lynx are a wide-ranging species requiring large, interconnected areas of suitable habitat. Habitat connectivity within geographic areas and with Canada may be important for long-term lynx population viability and maintenance of the contiguous United States DPS. While blocks of lynx habitat occurs across broad areas of the west, certain areas appear more important to supporting a viable resident lynx population. The lynx recovery outline distinguishes between core, secondary and peripheral lynx areas, and describes the relative importance of each to the recovery of the lynx DPS.

Lynx on Forest Service lands may be affected by management activities that reduce or degrade essential habitat elements used by lynx for denning, foraging, and recruitment, or that increase habitat fragmentation and lynx mortality. Effects may occur and/or continue without appropriate management direction at broad scales. This biological opinion evaluates the proposed action with respect to the threats and recovery needs for lynx.

ENVIRONMENTAL BASELINE

Status of the Species within the Action Area

Within the NRLA area, lynx habitat within 12 National Forests is considered core lynx area (U.S. Fish and Wildlife Service 2005) (Appendix A) and all are occupied by lynx (U.S. Forest Service and U.S. Fish and Wildlife Service 2006) (Table 3). Of the 18 National Forests within the action area, six are currently unoccupied by lynx (U.S. Forest Service and U.S. Fish and Wildlife Service 2006). None of the six unoccupied Forests are within the core areas identified in the recovery outline (U.S. Fish and Wildlife Service 2005). Of these six, four are in secondary area and two are in peripheral lynx area only. The Lewis and Clark, Gallatin and Helena National Forests have several disjunct mountain ranges in eastern Montana that has some lynx habitat in secondary area that is currently unoccupied (U.S. Forest Service and U.S. Fish and Wildlife Service 2006). See earlier discussion under “Proposed Action” section of this document for details.

Currently, we lack population data or information for any of the occupied areas. Within the NRLA area, only one research effort (Squires et al. 2006) is studying lynx demography. This effort has produced several publications and researchers are only now finalizing chapters on lynx population information.

Table 3. Lynx habitat in the NRLA area by occupied/unoccupied status (U.S. Forest Service 2007).

| National Forest | NF acres | Lynx habitat | Occupied Core | Occupied secondary | Unoccup. secondary | Unoccup. peripheral | % Occupied |
|----------------------|-------------------|-------------------|------------------|--------------------|--------------------|---------------------|------------|
| Ashley | 1,384,136 | 700,000 | 0 | 0 | 0 | 700,000 | 0 |
| Beaverhead-Deerlodge | 3,360,825 | 2,060,000 | 0 | 0 | 2,060,000 | 0 | 0 |
| Bighorn | 1,107,671 | 310,000 | 0 | 0 | | 310,000 | 0 |
| Bitterroot | 1,580,948 | 640,000 | 0 | 0 | 640,000 | 0 | 0 |
| Bridger-Teton | 3,437,527 | 2,000,000 | 2,000,000 | 0 | 0 | 0 | 100 |
| Clearwater | 1,825,397 | 930,000 | 0 | 930,000 | 0 | 0 | 100 |
| Custer | 1,187,621 | 230,000 | 200,000 | 0 | 0 | 30,000 | 87 |
| Flathead | 2,355,592 | 1,730,000 | 1,730,000 | 0 | 0 | 0 | 100 |
| Gallatin | 1,806,565 | 870,000 | 770,000 | 0 | 100,000 | 0 | 89 |
| Helena | 975,387 | 440,000 | 330,000 | 0 | 110,000 | 0 | 75 |
| Idaho Panhandle | 2,498,234 | 1,170,000 | 0* | 1,170,000 | 0 | 0 | 100 |
| Kootenai | 2,242,486 | 1,010,000 | 1,010,000 | 0 | 0 | 0 | 100 |
| Lewis and Clark | 1,862,289 | 970,000 | 380,000 | 0 | 500,000 | 90,000 | 39 |
| Lolo | 2,082,784 | 1,110,000 | 1,110,000 | 0 | 0 | 0 | 100 |
| Nez Perce | 2,224,230 | 810,000 | 0 | 0 | 810,000 | 0 | 0 |
| Salmon-Challis | 4,350,827 | 1,800,000 | 0 | 0 | 1,800,000 | 0 | 0 |
| Shoshone | 2,436,850 | 640,000 | 640,000 | 0 | 0 | 0 | 100 |
| Targhee | 1,810,854 | 1,050,000 | 0* | 1,050,000 | 0 | 0 | 100 |
| Total | 38,530,223 | 18,470,000 | 8,170,000 | 3,150,000 | 3,320,000 | 1,130,000 | 61 |

Note 1: A minor amount of lynx habitat is core.

Factors Affecting the Species Environment within the Action Area

The action area includes lynx habitat on the following 18 National Forests in the Northern Rockies in Montana, Idaho, Wyoming, Utah, and a small portion of Washington: Beaverhead-Deerlodge, Bitterroot, Clearwater, Custer, Flathead, Gallatin, Helena, Idaho Panhandle, Kootenai, Lewis and Clark, Lolo, Nez Perce, Bighorn, Shoshone, Ashley, Bridger-Teton, Salmon-Challis, and Targhee. This lynx habitat forms the environmental baseline against which future Forest actions will be measured and assessed. In the NRLA area, Federal land accounts for the preponderance of lynx habitat. Of this habitat the Forest Service manages the vast majority of acres, the BLM and private land owners manage only a small portion of lynx habitat. In the NRLA area, Federal land management, specifically under the Forest Service Plans, has the potential to exert substantive effects on lynx populations in geographic areas.

Lynx are currently known to exist in Idaho, Montana and Wyoming, but not in Utah. As stated earlier, lynx have probably always occurred only intermittently in Utah. Like most of the geographic areas that support lynx within the contiguous United States, the Northern Rockies are directly contiguous with lynx habitat and populations in Canada. In the Northern Rocky Mountains, the majority of lynx occurrences is associated with the Rocky Mountain Conifer Forest vegetative class (Kuchler 1964; McKelvey et al. 2000b) and occur above 1,250 m (4,101 ft) elevation (Aubry et al. 2000; McKelvey et al. 2000b). The dominant vegetation that constitutes lynx habitat in these areas is subalpine fir, Engelmann spruce and lodgepole pine (Aubry et al. 2000; Ruediger et al. 2000). Lodgepole pine is an earlier successional stage of subalpine fir and Engelmann spruce climax forest cover types.

The largest proportion of lynx habitat on Federal lands in west are in nondevelopmental land allocations, where natural processes predominate. Sixty-seven percent of lynx habitat on Federal lands within the NRLA area is within nondevelopmental land allocations (Table 4). Approximately 12,369,833 acres of lynx habitat within the NRLA area (Forest Service lands) occur in non-developmental allocations (wilderness, primitive, non-motorized area, roadless etc.) and 7,940,000 acres (32 percent) occur within developmental allocations.

Table 4. Lynx habitat on National Forest (FS) lands within the Northern Rockies lynx amendment area (data from U.S. Forest Service 2007).

| Total FS acres w/i the Northern Rockies amendment area ^a | Acres of FS lynx habitat ^b (% of total FS acres) | Acres of FS lynx habitat w/i non-developmental land allocations including wilderness (% of lynx habitat) ^c | Acres of FS lynx habitat w/i developmental land allocations (% of lynx habitat) ^d |
|---|--|---|--|
| 38,530,000 | 18,470,000 (48%) | 12,396,833 (67%) | 6,073,167 (32%) |

^a Total acreage of National Forest lands within the NRLA area.

^b Total acres mapped by National Forest based upon interagency mapping direction memo of August 2000.

^c Allocations where natural disturbance processes predominate (wilderness, roadless, semi-primitive non-motorized areas).

^d Allocations other than those identified as non-developmental

Further, nondevelopmental land allocations are found on each of the 18 National Forests. Large proportions of lynx habitat, occupied and unoccupied by lynx, occurs within these allocations (Table 5). In nondevelopmental allocations, such as wilderness, ecological processes such as fire, insects, and disease operate relatively free from human intervention (see Appendix F). Diversity resulting from natural succession and disturbance predominate and non-native vegetation is rare. Such allocations are beneficial to lynx. Roadless designation limits construction of roads and timber harvest, two substantial human impacts on wildlife habitat in general, so in such areas natural succession and disturbance are also likely to predominate.

Table 5. Overlap of lynx habitat with wilderness and roadless areas by Forest (U.S. Forest Service 2007).

| FOREST | Acres wilderness in lynx habitat (% lynx habitat) | Acres roadless in lynx habitat (% lynx habitat) | Total acres wilderness/ roadless in lynx habitat | Total acres lynx habitat | % of lynx habitat in wilderness or roadless |
|-----------------------------------|--|--|---|-------------------------------------|--|
| Occupied by lynx | | | | | |
| Bridger-Teton | 691,927 (35) | 859,530 (43) | 1,551,457 | 2,000,000 | 78% |
| Clearwater | 144,3421 (6) | 578,859 (62) | 723,202 | 930,000 | 78% |
| Custer | 77,418 (34) | 75,243 (33) | 152,661 | 230,000 | 66% |
| Flathead | 730,935 (42) | 364,011 (21) | 1,094,946 | 1,730,000 | 63% |
| Idaho Panhandle | 9,8785 (1) | 468,295 (40) | 478,173 | 1,170,000 | 41% |
| Kootenai | 45,826 (5) | 390,250 (39) | 436,076 | 1,010,000 | 43% |
| Lolo | 117,742 (11) | 466,279 (42) | 584,021 | 1,110,000 | 53% |
| Shoshone | 319,1485 (0) | 148,545 (23) | 467,694 | 640,000 | 73% |
| Targhee | 68,585 (7) | 448,646 (43) | 517,231 | 1,050,000 | 49% |
| Mixed occupied/unoccupied | | | | | |
| Gallatin | 290,554 (33) | 343,404 (39) | 633,958 | 870,000 | 73% |
| Helena | 64,989 (15) | 221,197 (50) | 286,186 | 440,000 | 65% |
| Lewis & Clark | 223,089 (23) | 505,347 (52) | 728,436 | 970,000 | 75% |
| Total occupied | 23% | 40% | | | 63% |
| Unoccupied by lynx | | | | | |
| Ashley | 148,266 (21) | 421,358 (60) | 569,623 | 700,000 | 81% |
| Bighorn | 45,898 (15) | 191,645 (62) | 237,544 | 310,000 | 77% |
| Bitterroot | 144,342 (23) | 228,819 (36) | 373,162 | 640,000 | 58% |
| Beaverhead-Deerlodge | 144,342 (7) | 1,151,161 (56) | 1,295,503 | 2,060,000 | 63% |
| Nez Perce | 398,824 (49) | 211,035 (26) | 609,859 | 810,000 | 75% |
| Salmon-Challis | 611,777 (34) | 798,961 (44) | 1,410,738 | 1,800,000 | 78% |
| Total unoccupied | 24% | 48% | | | 71% |
| Total acres occ/unoccupied | 4,497,105 | 7,872,728 | 12,369,833 | 18,470,000 | 67% |

Wilderness – are those areas designated as wilderness by Congress

Roadless – are those areas identified as roadless areas in the 2001 Roadless rule – some areas may have roads as the inventories were not adjusted; however the 2001 roadless rule applies, which limits road construction and reconstruction in these areas.

Of the 12, 370,000 acres in roadless about 1,840,000 are in management areas that could be developed; however these areas are now constrained by the 2001 roadless rule, which limits road construction and timber harvest in roadless areas.

Factors identified in the Final Listing Rule and Remanded Decision The final rule (March 24, 2000; 65 FR 16052) concluded that the primary factor threatening the lynx DPS is the inadequacy of existing regulatory mechanisms, specifically the lack of guidance for conservation of lynx in federal land management Plans. The Service concluded that the lack of Plan guidance for conservation of lynx, as evidenced by the fact that, at the time of listing, Plans allowed or directed actions that cumulatively adversely affect lynx, was a significant threat to the contiguous United States DPS of lynx. Our remanded determination in our clarifications of findings of our final rule (July 2003; 68 FR 40076) affirmed the findings in the final rule.

Land Management Authorities

The 1982 National Forest Management Act regulations (36 CFR 219.19) provided the following direction to the Forest Service, “Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species.” The lynx has been listed as a sensitive species by the Forest Service. The Forest Service policy (FMS 2670.32) is to “avoid or minimize impacts to sensitive species; if impacts cannot be managed to maintain viable populations, a decision must not result in loss of existing native and desired non-native vertebrate species viability or create a significant trend toward Federal listing.”

As described previously, the final rule identified the single factor threatening the contiguous United States DPS of lynx as the inadequacy of existing regulatory mechanisms; specifically the lack of guidance provided in the Plans for avoiding adverse impacts to lynx and for the conservation of lynx on Forest Service administered lands. National Forests encompass a preponderance of lynx habitat, especially in the western States. Thus, Forest Service land management practices can significantly influence the maintenance of lynx habitat and their prey. Many of the existing Plans had general provisions for conservation/management of wildlife and wildlife habitats, but very few specifically address lynx (Hickenbottom et al. 1999). Plans that had specifically addressed lynx at the time of listing had not incorporated the information in the Science Report or LCAS, which were then considered to be the most current knowledge regarding lynx conservation.

Risk factors within federal authority and jurisdiction

Lands under Federal management are clearly necessary to sustain lynx populations in the NRLA area. Federal lands account for the majority of lynx habitat in the area, and therefore Federal land management has the potential to highly influence lynx conservation. In the LCAS, the Lynx Biology Team identified potential risk factors to lynx that are within the authority and jurisdiction of the Federal land management agencies to control. As written, the existing Plans allow, but do not necessarily require or direct, actions that could result in risks to lynx. Some of these risk factors occur within the NRLA area. Lynx risk factors listed in the BA include:

I. FACTORS AFFECTING LYNX PRODUCTIVITY

- Conversion or alteration of native plant communities
- Fire suppression and hazardous fuels reduction
- Grazing
- Pre-commercial thinning

- Recreational use
- Road and Trail Access
- Timber management

II. FACTORS AFFECTING LYNX MORTALITY

- Highways
- Predation by other species
- Predator control activities
- Shooting
- Trapping

III. FACTORS AFFECTING LYNX MOVEMENTS

- Highways and associated developments
- Private land development

These factors have varying effects on lynx, depending upon the nature, location, duration and timing of the activity. Some present more likelihood of risks to lynx, others are relatively benign in effects. In nondevelopmental allocations and roadless areas, a number of these factors would not affect lynx. Importantly, the rather substantial risks to lynx habitat that are often associated with some vegetation management actions (e.g. timber management and precommercial thinning) typically do not arise in areas in nondevelopmental allocations or roadless areas. Factors affecting lynx mortality, including those associated with highways, predator control, and private land development activities generally are not an issue. Factors such as trapping or shooting, while not entirely eliminated, are lessened significantly in nondevelopmental and roadless areas due to limited access for people. Approximately 67 percent of all lynx habitat in the action area, including occupied and unoccupied, is in wilderness or roadless allocations and is distributed across the 18 Forests (Table 5). This provides a significant amount of protection for lynx and lynx habitat within the NRLA area.

The Forest Service has varying levels of authority and jurisdiction over the factors listed above, especially as they relate to risks to lynx. For instance, the Forest Service typically has little influence on highways and associated development, or private land development but has substantial influence on lynx through vegetation management actions on National Forests.

Since 2000, the Forests have managed lynx habitat under existing Forest Plans as implemented through the Conservation Agreements, described earlier. This management has benefited lynx habitat during that time. Few of the factors listed above have resulted in adverse effects to lynx or lynx habitat on Forest Service lands, as the Conservation Agreement required deferral of projects that were likely to adversely affect lynx. Vegetation management projects such as precommercial thinning or timber harvest resulting in more than 30 percent of lynx habitat being in early seral conditions within an LAU, did not occur on National Forest lands under the agreements up until 2006, with the new direction to apply the agreements to occupied lynx habitat. Hillis et al. (2003) analyzed the effects that past timber harvest on National Forests (and other lands in Region One) has historically had on creating these early seral stages, or stand initiation phases. Based upon analysis areas that approximated a multiple LAU scale, a 4th code hydrologic unit, 9.2 percent of National Forest lands and 8.9 percent of lands of all ownerships

were in a stand initiation or early seral phase. Only 2.5 percent of the 4th code hydrologic units were determined to have exceeded the LCAS standard that requires management actions change no more than 15 percent of lynx habitat in an LAU to stand initiation phase per decade. Fire was determined to be the dominant influence in creating early seral conditions in lynx habitat. Note that fire in lynx habitat is generally considered beneficially to creating the mosaic of mixed-age stands desirable for promoting snow shoe hare populations and high quality lynx hunting conditions. The BA indicates that the analysis was conducted using data from 1986 through 2001, and included years when timber harvest was very extensive in some areas. This indicates that the overall baseline condition of lynx habitat, in regards to vegetation, is in good condition at the regional scale.

EFFECTS OF THE ACTION

This section includes an analysis of the direct and indirect effects of the proposed action on the species. Direct effects are impacts on species that occur at the same time and place as the action and are caused by the action. Indirect effects are impacts caused by or resulting from actions of specific projects, but they occur later in time and are reasonably certain to occur.

The Forest Service proposes to amend the 18 Plans within the NRLA area to include lynx conservation measures. Our 2000 biological opinion concluded that if Plans were amended or revised with the conservation measures the LCAS, or an equivalent thereof, then the Plans would not likely jeopardize lynx. The proposed amendment would incorporate the primary conservation benefits of the LCAS conservation measures into management direction. However, the Forest Service proposes to relax some of the restrictions on activities in lynx habitat compared to the LCAS management standards analyzed in the 2000 biological opinion. In some cases, standards were changed to guidelines because the Forest Service considers guidelines more appropriate for those risk factors the Service determined were not negatively affecting the contiguous U.S. DPS as a whole (68 FR 40076), because that level of constraint [implied by standards] is unwarranted (R. Smith, pers. comm. 2006). Further, in some cases there was limited scientific or other information that indicated standards were needed in most cases to avoid adverse effects to lynx or lynx habitat (see Appendix C). Guidelines would be implemented in most cases (BA) and where not adhered to for compelling reasons, adverse effects to lynx are not necessarily inevitable. Thus, this analysis will highlight differences in LCAS direction (as analyzed in the 2000 biological opinion) contained in the proposed action, and concentrate on the effects related to those differences.

The Forest Service based effects determinations on what the Plans permit or prohibit, as well as, when information was available, a quantitative assessment of the effects to lynx of actions that had the most potential to negatively affect lynx. Information included estimated projections of future actions, as well as projected or needed funding in comparison to past funding. The Forest Service analyzed what the proposed action would allow and what was anticipated to occur. However, many actions that are allowed and projected may not actually occur. For instance, many Plans allow timber harvest. However, timber harvest levels on Federal land across the western United States had declined consistently and dramatically (approximately 80 percent) over past decades or longer, even though Plans allowed more harvest (R. Gay, U.S. Forest

Service, in litt. 1999 *in* U.S. Fish and Wildlife Service 2000). The same trend holds in forest types that provide lynx habitat (B. Bollenbacher, U.S. Forest Service, in litt. 1999; B. Ferguson, U.S. Forest Service, pers. comm. 1999; F. Zenson, U.S. Forest Service, pers. comm. 1999; B. Short, U.S. Forest Service, in litt. 1999; all *in* U.S. Fish and Wildlife Service 2000). Forest Service Plans allow, but do not necessarily direct, actions to occur. Many activities that are allowed by the current and proposed Plans are never fully carried out for a variety of reasons, such as funding limitations and environmental or policy considerations. The BA provided details on likely scenarios for future actions, given the expectations for future funding. Future implementation of the Plans as currently written is partly dependent on political, economic, and local considerations.

Another factor considered in this effects analysis was our limited knowledge of some areas of lynx ecology specific to the contiguous United States. Some uncertainty exists regarding the level and type of effects that land use management decisions at both project and programmatic levels may have on the contiguous United States lynx DPS. We observe that researchers have suggested that land management plans should thus be conservative in their retention of known important lynx habitat components (McKelvey et al. 2000a).

Between 1998 and 2000, in the face of these uncertainties and knowledge gaps, the Service, Forest Service, BLM, and the National Park Service accumulated available information on lynx through development of the Science Team Report and the LCAS. These efforts demonstrate a commitment by the Federal action agencies to cooperate to improve knowledge of lynx ecology. Since the LCAS was written, additional information became available regarding lynx, snowshoe hares, and their habitat (see Appendix C in BA). Ongoing research efforts in Montana, Washington, and Wyoming should provide additional lynx and lynx habitat information in the near future. If research or other efforts provide information that reveals effects to the species not considered in this biological opinion, additional consultation may be required (50 CFR 402.16).

The BA indicates the importance of the LCAS for guiding management of lynx habitat on federal lands. Since issuance of the LCAS in 2000, additional research and information has become available to inform our management of lynx habitat. Appendix C of the BA lists available lynx research information for the United States, including that in progress or completed after 2000. While still a relevant source of information, as noted earlier, the 2000 LCAS is being updated and clarified with this information and additional information as it becomes available (James Claar, U.S. Forest Service pers. comm. 2006). We used the LCAS and research and information from before and after 2000 to develop this opinion, depending upon its relevance, status and availability.

Assumptions in the Forest Service's Biological Assessment

The Forest Service analyzed the effects of their proposed action based on several assumptions. These assumptions are outlined on page 16 of the BA. Two factors weigh heavily into the effects analysis in this biological opinion. These are: 1) the analysis of effects is primarily based on projections of changes in future Forest Service activities resulting from the proposed standards and guidelines; and 2) guidelines are assumed to be followed except where compelling

reasons such as the protection of other species at risk or protection of public safety are an issue (see Assumption 6 from BA).

Some of the differences between the proposed action and existing baseline management (existing forest plans with interim guidance to follow the Conservation Agreements) have to do with the conversion of “standards” to “guidelines.” Under the Forest Service regulations, standards are mandatory but do not compel project activities to occur. A site specific Forest Plan amendment is required where standards are not adhered to. Guidelines, on the other hand, are not mandatory but are normally followed. If guidelines are not followed, a rationale should be documented but an amendment to the Plan is not required. The DEIS on page 6, states:

The Proposed Action would add or modify management direction in existing plans and would consist of one or more of the following:

- *Goals*, which are general descriptions of desired results;
- *Objectives*, which are descriptions of desired resource conditions;
- *Standards*, which are management requirements designed to meet the objectives; and
- ***Guidelines, which are management actions normally taken to meet the objectives.***

This interpretation, supported by the Forest Service’s assumption (see BA page 16) that guidelines will be followed except where compelling reasons exist, is important in our analysis. As did the Forest Service in its BA, we will also assume that guidelines will be followed unless such compelling reasons exist. If this assumption is determined to be incorrect as projects and second tier consultations proceed, consultation on the Plans may need to be reinitiated to determine whether this assumption resulted in additional effects to lynx that were not considered and analyzed in this biological opinion (50 CFR 402.16).

Additional Assumption

In addition to the assumptions contained in the Forest Service’s BA, our analysis depended on an additional assumption. As written, the proposed action allows for up to six percent of occupied lynx habitat within any one Forest to be exempted from the vegetation standards to conduct fuels management projects. This amount corresponds to about 729,000 acres of occupied lynx habitat. The Forest Service did not indicate how these acres would be distributed across a Forest. If a large amount of that habitat to be treated under the fuels exemptions was concentrated within an area of known high importance to lynx or on several adjacent LAUs, the effects to lynx could be considerable. However, the Forest Service indicates that “Based upon the analysis in the BA and funding limitations, it is unlikely that any one LAU would be affected to a great degree (Tim Bertram and Ray Smith, U.S. Forest Service, in litt. 2006).” Further, funding available to conduct hazardous fuel treatments is limited and would be spread among the various Forests within the NRLA area to protect the WUI, according to need, making it unlikely that a large number of acres would be treated in any one limited geographic area (R. Smith, pers. comm. 2006). The BA supports this assumption, as Tables 10 and 11 indicate a distribution of fuel treatment needs amongst administrative units within the amendment area. Therefore, while it is theoretically possible that a number of adjacent LAUs would be rendered unsuitable, it is reasonable to assume this scenario is unlikely.

For the purposes of this biological opinion, the Service assumes that fuel management projects within the WUI would be distributed throughout a Forest and would not be excessively concentrated within adjacent LAUs. If this assumption is determined to be incorrect as projects and project level consultations (second tier) proceed, this consultation may need to be reinitiated to determine whether this assumption resulted in additional effects to lynx that were not considered and analyzed in this biological opinion. The proposed action includes monitoring requirements to report and track actions conducted under exceptions by each Forest. Further, site specific consultation (second tier) is required for actions that may affect listed species, including those conducted under the exceptions and exemptions. Therefore, the monitoring and reporting required in the proposed action, along with routine project specific consultation, provides the Service a means to assess the validity of our assumptions.

Analysis of Effects of the Proposed Action in Occupied Lynx Habitat

The following analysis pertains to the effects of the amendment affecting those 12 Forests that manage occupied lynx habitat, and only to those portions of the Forests where lynx habitat is occupied. The use of the term “lynx habitat” will be synonymous with “occupied lynx habitat” for the following effects analysis. The amendment would be implemented in occupied lynx habitat on all Forests following the final record of decision.

Since lynx are not known to occur in “unoccupied” lynx habitat at this time, the proposed action would not affect individual lynx in those areas. The Lewis and Clark, Gallatin and Helena National Forests manage areas of occupied lynx habitat (all of which is in core area), but also manage a number of small or disjunct mountain ranges with lynx habitat that are unoccupied (all are in lynx secondary or peripheral area). Six other Forests manage only lynx habitat that is presently unoccupied (all are in secondary or peripheral area) (see Table 1.). An analysis of potential effects to lynx, and lynx recovery, pertaining to those six Forests and unoccupied lynx habitat on the Lewis and Clark, Gallatin, and Helena National Forests will follow under the section titled: *Effects of the Proposed Action in Relationship to Recovery*.

The following sections analyze the effects of the measures in the proposed action on lynx, by primary areas of concern.

Habitat Connectivity Incorporating standard **ALL S1** (Appendix C) would address the impacts to lynx from loss of connectivity within occupied habitat in the NRLA area. This standard requires that new or expanded permanent developments and vegetation management projects in a LAU or linkage area maintain habitat connectivity. Thus, under this standard, Forest Service actions will not be permitted to degrade connectivity in lynx habitat or in linkage areas. Further, the Forest Service has also incorporated objectives, standards and guidelines for management direction to improve connectivity (**LINK 01, S1, G1 and G2, and HU O6, G3, G7**) (see Appendix B).

This direction is consistent with recommendations in the LCAS. Many actions that affect connectivity in or between blocks of lynx habitat are primarily conducted under the authority of other agencies, such as highway departments or private landowners. The proposed direction

promotes maintenance and improvements in connectivity to the extent that the Forest Service has authority to influence or control actions that affect connectivity. There may be instances where Forest Service actions, such as permitting the expansion of ski areas, result in indirect adverse effects on connectivity for individual lynx, due to associated development on private lands. However, given the geographic extent of lynx habitat within the NRLA area, and the number, location and size of existing ski areas (Table 5, Appendix D), we anticipate that the level of adverse effects to connectivity expected from these sorts of actions would be insignificant or discountable on the population as a whole, as the standards and guidelines require maintenance of connectivity in lynx habitat.

The objectives, standards and guidelines described above would reduce or minimize the potential for adverse effects to lynx in most cases, and therefore the Plans would ultimately conserve adequate connectivity with occupied lynx habitat. Therefore, the proposed action, related to effects on connectivity, would not contribute to appreciably diminishing survival or recovery of lynx within occupied lynx habitat in the NRLA area. (See also discussion under Effects of the Proposed Action in Relationship to Recovery.) The specific effects of these types of projects would be analyzed during project-specific consultation.

Vegetation Management including (Timber Harvest and Management, Salvage Harvest, Fuels Treatment) The primary factors driving lynx populations, behavior and distribution is the abundance and distribution of their snowshoe hare prey. As noted earlier, vegetation management or natural fire can set back vegetation succession to an early seral stage, which may be used by hares during the summer but is snow-covered and thus unavailable to hares during the winter. The LCAS defines “lynx habitat in unsuitable condition” as those areas within mapped lynx habitat that are in these early successional stages as a result of recent fires or vegetation management, in which the vegetation has not yet developed sufficiently to support snowshoe hare populations during all seasons (Ruediger et al. 2000). However, eventually these stands regenerate and provide high stem densities and horizontal structure extending above snowpack during the winter, and become high quality snowshoe hare habitat. High quality lynx habitat contains an abundance of this early successional habitat in “unsuitable condition” (up to 30 percent of an LAU) within a mosaic of mid- to late-seral stands. For purposes of this amendment, “stand initiation structural stage” is synonymous with “lynx habitat in unsuitable condition” (as used in the LCAS).

Older forested stands also provide high quality winter habitat when they provide multi-story structure that provides forage and horizontal cover, for both lynx and snowshoe hare (Murray et al. 1994). In Montana, these stands were used consistently by both lynx and snowshoe hare during the winter (Squires et al. 2006). These stands, along with stands in a stand initiation structural stage and intervening successional stages, provide the landscape mosaic of habitat conditions needed for snowshoe hare production and lynx foraging (hunting) habitat, and thus for recovery and survival of lynx.

The Forest Service has identified four objectives related to vegetation management that would improve the quality of lynx habitat by improving conditions for prey: 1) manage vegetation to mimic or approximate natural succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx (**VEG O1**); 2) provide a mosaic of habitat

conditions through time that support dense horizontal cover and high densities of snowshoe hare, and provide winter snowshoe hare habitat in both the stand initiation structural stage and in the mature, multi-story conifer vegetation (**VEG O2**); 3) conduct fire use activities to restore ecological processes and maintain or improve lynx habitat (**VEG O3**); and 4) focus vegetation management in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover (**VEG O4**).

Standards **VEG S1**, **VEG S2**, **VEG S5**, and **VEG S6** would lead to attainment of the objectives above by ensuring that enough habitat within each LAU would be available to provide lynx with sufficient snowshoe hare prey and lynx foraging (hunting) habitat conditions. The direction for **VEG S1** and **S2** is consistent with the LCAS. Under **VEG S1**, the majority of the lynx habitat in the action area (94 percent) would be managed so that LAUs would have no more than 30 percent of area in early seral stand initiation stages that do not yet provide snowshoe hare winter foraging habitat. Additionally, **VEG S2** requires that timber management will not “regenerate” (i.e., change to early seral stand initiation stage) more than 15 percent of lynx habitat in an LAU in a 10-year period. It is important to note that early seral stand initiation stages are not considered adverse if they occur in less than 30 percent of an LAU. Indeed, these young stands typically contain high stem densities and horizontal cover, which provides summer habitat and eventually grows into essential mid-to-later seral winter foraging habitat for snowshoe hares. The 30 percent per LAU limit on stand initiation phase habitat and the 15 percent change per decade limit promote a balance, a mosaic, of young and older stands within each LAU.

Standard **VEG S5** further ensures that high quality snowshoe and lynx habitat is not degraded by deferring precommercial thinning during the stand initiation structural stage, until the stand no longer provides winter snowshoe hare habitat. This direction is consistent with the LCAS. This standard protects and maintains the high stem densities that provide high quality snowshoe hare forage during both summer and winter seasons. Thinning can reduce horizontal cover that is critical to maintain the snowshoe hare prey base. Horizontal cover is important to hares and lynx. In summer, lynx broaden their habitat use from older, multi-storied forest stands to include younger forest stands with an abundance of shrub cover (Squires et al. 2006). The researchers assumed “this shift in habitat use [by lynx] during summer is due to hares being abundant in young forest stands with deciduous vegetation providing high horizontal cover.” Reducing dense horizontal structure through silvicultural thinning would likely reduce an area’s carrying capacity for snowshoe hares (Ruggiero et al. 2000b). In the southern portion of the range of lynx in the contiguous United States, lynx populations appear to be naturally limited by the availability of snowshoe hare prey, as evidenced by large home range size, high kitten mortality due to starvation, and greater reliance on alternate prey (Aubry et al. 2000). Deferring thinning in young dense conifer stands until they reach older age classes maintains the inherent capacity of the habitat to produce snowshoe hares.

Standard **VEG S6** similarly conserves lynx habitat by precluding vegetation management actions that reduce snowshoe hare habitat in multi-storied mature or late successional forests. This standard represents an important conservation measure in addition to those in the LCAS. Standard **VEG S6** was based in part on recent information gained through on-going research (Squires et al. 2006) within the NRLA, which was not available during development of the LCAS. Lynx preferentially foraged in spruce-fir forests with high horizontal cover, abundant

hares, deep snow, and large-diameter trees during the winter (Squires et al. 2006). The high horizontal cover found in multistory conifer stands was a major factor affecting winter hare densities (Hodges 2000a, b *in* Squires et al. 2006). During winter, snowshoe hares were consistently found in multi-storied forest stands. These older, multi-storied stands provide forage, hiding cover, and likely thermal cover for both snowshoe hares and lynx. This new standard is a significant improvement in conserving lynx in addition to the vegetation management measures in the earlier LCAS.

Guideline **VEG G1** is consistent with the LCAS and directs that vegetation management projects recruit high density of conifers and management focus on those stands currently not providing snowshoe hare habitat (e.g. mature monotypic lodgepole pine stands). Guideline **VEG G11** directs that denning habitat be distributed in each LAU.

VEG S1, S2, S5 and S6 and VEG G1 and G11 would work together promote vegetation management objectives. Based on the best available information, the Service concludes that combined, this direction would conserve the most important components of lynx habitat: a mosaic of early, mature and late successional staged forests, with high levels of horizontal cover and structure. These components ensure habitat that maintains its inherent capability to support both snowshoe hare prey base and adequate lynx foraging habitat (and denning habitat, discussed later) during all seasons. These standards are required for all vegetation management actions on at least 94 percent of lynx habitat within the NRLA area. Areas within the WUIs (totaling six percent of lynx habitat) are exempt from these standards, however **VEG G10** would apply and requires at least some consideration of the standards in designing fuel reductions treatments. Where these standards are applied to vegetation management projects, we anticipate few projects, if any, would have adverse effects on lynx. Collectively, application of these standards for vegetation management is expected to avoid adverse effects to lynx and promote the survival and recovery of lynx populations.

Exemptions and exceptions to vegetation standards for fuels management and precommercial thinning

The proposed amendment includes exemptions from standards **VEG S1, S2, S5, and S6** to allow for fuels management within the WUI. Also, exceptions listed in **VEG S5 and S6** would allow some precommercial thinning to protect structures, for research and to promote the conservation of tree species such as whitebark pine and aspen. These exemptions and exceptions would allow actions that may have adverse effects on lynx by reducing the horizontal structure of natural forest succession phases, and/or affecting the mosaics of the forested landscape in localized areas. The total area that *could* be impacted by the exemptions is limited to no more than about 729,000 acres (or about six percent of lynx habitat) in occupied lynx habitat, and exceptions could impact approximately another 64,320 acres (about 0.5 percent of occupied lynx habitat) (Appendix D, Table 1).

Exemptions from **VEG S1** for fuel management would affect the forest mosaic by allowing more than 30 percent of lynx habitat within an LAU to be in a stand initiation structural phase. Further, the exemption for fuel management in **VEG S2** would allow more than 15 percent of an LAU to be converted from suitable to stand initiation structural stage within a decade. Where

exemptions from **VEG S1** or **S2** are used within the WUI, there would be likely be adverse effects to lynx by reducing the quality and productivity of lynx and snowshoe hare habitat for at least 10 to 15 years, depending upon location, until treated stands regenerate to provide winter snowshoe hare habitat. Further, depending upon the fuel loading, location and funding, these stands may be treated again to retain them as fuel breaks and not allowed to regenerate, extending the length of time they remain in early seral conditions. This is most likely in those areas closest to communities or structures (generally < .25 miles); in most other cases, the Forest Service would consider moving the openings around to reduce fire size and intensity (Joan Dickerson, U.S. Forest Service, pers. comm. 2007). These openings would be allowed to regenerate.

The exemption from **VEG S5** for fuel management would reduce natural levels of horizontal structure in early successional phases by allowing precommercial thinning during the stand initiation structural stage, prior to when the stand no longer provides winter snowshoe hare habitat. It is well documented that such thinning in hare habitat results in a corresponding decrease in the abundance of snowshoe hares (see Ruggiero et al. 2000; see also BA Appendix C). Thinning dense stands of young trees would adversely affect lynx by reducing the capacity of these stands to produce snowshoe hares. Similarly, the exemption for fuel management from **VEG S6** would likewise allow management actions that would reduce the horizontal cover and thus quality of snowshoe hare habitat in older, multi-layered stands. Research has recently documented the importance of these older stands as foraging habitat for lynx and for hares in the NRLA area (Squires et al. 2006), especially during the winter months. Thus, exemptions in either **VEG S5** or **S6** may reduce the capacity of an LAU to support lynx reproduction and/or occupancy. The impact would depend upon the size of the treated area as well as the inherent capacity of the site to produce snowshoe hares. Overall, the amendment limits the exemptions from **VEG S5 and S6** to areas within the WUI, and so the anticipated adverse effects would occur in no more than six percent of lynx habitat.

Over the next ten years, the proposed action would also allow exceptions to **VEG S5 and S6** for thinning projects that would protect structures from wild fire or to conserve other vegetation communities such as whitebark pine and aspen. The amount of pre-commercial thinning that could reduce the quality of snowshoe hare habitat in occupied lynx habitat would range from a total of approximately 21,170 to 64,320 acres, or 2,117 to 6,432 acres per year for the life of the Plans. The pre-commercial thinning allowed under **VEG S5** would be dispersed across the National Forests in the NRLA area (see Table 1, Appendix D). The Idaho Panhandle National Forest proposes to treat substantially more acres than other Forests: 40,280 acres (4,028 acres per year) would be treated over 10 years. However, 36,400 acres of this thinning is slated to restore western white pine habitat; 80 percent of the cover in western white pine stands would be retained (Table 1, Appendix D). Other Forests have estimated substantially less need for such projects.

A maximum of six percent of occupied lynx habitat (about 729,000 acres) within the NRLA could be treated through the exemptions and additional 0.5 percent (about 64,000 acres) through the exceptions described above for both fuels management and vegetation management to benefit other resources during the next ten years. This amounts to a total of about 6.5 percent of occupied lynx habitat in the action area. However, given likely funding scenarios, it is unlikely

that this much lynx habitat would actually be treated (BA). Based upon projected funding levels, the Forest Service suggests a more likely estimate of 563,130 acres of lynx habitat treated to reduce hazardous fuels over a 10-year period (Appendix E). This equates to about 4.6 percent of *all* occupied lynx habitat, versus the maximum exemption of 6 percent within the WUI. More likely, about 170,270 acres (1.4 percent) of occupied lynx habitat is likely to be treated within the next decade within the WUI, where exemptions could be used (Appendix E). Another 392,860 acres (3.2 percent) of occupied lynx habitat is expected to be treated outside the WUI, but objectives, standards and guidelines would apply. Therefore, while we assume the worst case scenario of six percent of lynx habitat being treated under exemptions, it is most probable that a) the entire WUI (six percent of occupied lynx habitat) would not be treated with fuel reduction projects (treated area would be more on the order of 1.4 percent of lynx habitat in the WUI; see Appendix E), and b) not all fuel treatment projects within this area would require use of the exemptions and so would not result in adverse effects to lynx. It is likely that many fuel treatment projects could either comply with the standards, and or would adhere to **VEG G10** and be designed considering **VEG S1, S2, S5, and S6**, reducing the level of adverse effects. Similarly, it is unlikely that full funding would be obtained for the work allowed under the exceptions listed in **VEG S5 and S6**.

For perspective on the total area likely treated with projects that may adversely affect lynx, the average home range size of a lynx in the NRLA area was reported as 53,375 acres for males and 21,745 acres for females (Squires et al. 2004). Actions conducted under exemptions and exceptions would be distributed among the 12 individual National Forests with over 12,500,000 acres of occupied lynx habitat across the NRLA area. Adverse effects, while possible, are likely to affect only portions of any individual lynx home range. If acres of these treatments were concentrated in an area the effects to individual lynx may be more significant, but would affect fewer lynx. Further, many of the WUI areas occur at lower elevation (i.e. near the lower edge of lynx habitat) and are less likely to be the highest quality lynx habitat, which may reduce the potential overall effect of the exemptions (T. Bertram, pers. comm. 2007). Under the proposed action, vegetation treatments that adversely affect the essential components of lynx habitat would not be allowed in ninety-four percent of occupied lynx habitat.

Under the assumption that the exemptions and exceptions for fuels management and vegetation management would be spread across the administrative units within the action area, the worst case scenario of six percent of lynx habitat being subject to treatments that do not comply with **VEG S1, S2, S5 or S6** would adversely affect foraging for individual lynx, but as limited, the number of individuals affected would not result in adverse impacts to the survival and recovery of the lynx, either within the NRLA area or to the species as a whole. The proposed management would allow for the action area as a whole to serve its role in the conservation of lynx, by maintaining its inherent capacity to provide a prey base and foraging habitat for a breeding population of lynx and connectivity for lynx movement within home ranges, and dispersal.

The BA (Table 18) states that the baseline condition (referring to current Plan management under the Conservation Agreements) contributes to conserving lynx, and that the proposed action “partially” contributes to conserving lynx, due to exemptions and exceptions to vegetation standards for fuel treatment and thinning that result in adverse effects. However, other than fuel

treatments in the WUI or for exceptions analyzed above, the proposed action would continue to preclude pre-commercial thinning and understory removal in the majority of lynx habitat within the action area and thereby reduce the potential for degradation of existing snowshoe hare habitat. Additionally, **VEG S6** is a new standard designed to conserve multi-storied stands and represents a substantial improvement over the baseline condition, existing Plans, and recommendations in the LCAS. **VEG S6** is a standard not included in the 2000 LCAS and based upon recent research efforts on use of habitat by lynx (Squires et al. 2006). This standard will further retain and promote important lynx habitat components, foraging and denning habitat.

On the whole, the potential for adverse effects in up to six percent of lynx habitat would be offset by the vegetation management direction that applies to the remaining 94 percent, which would provide objectives, standards and guidelines for appropriate long-term management of lynx and snowshoe hare habitat. The vegetation objectives, standards and guidelines would contribute to sustaining and growing snowshoe hare and lynx populations within the both core areas and occupied secondary areas within the NRLA area, and would therefore avoid an appreciable reduction in the reproduction, numbers, and distribution of lynx in the NRLA area.

Fire Management In the western United States, fire historically played an important role in maintaining the mosaic of forest successional stages that provide habitat for both snowshoe hare and lynx (Fox 1978; Bailey et al. 1986; Quinn and Thompson 1987; Koehler and Brittell 1990; Poole et al. 1996; Slough and Mowat 1996). Periodic fire maintains this mosaic by reducing forest stands to early seral stages. Suitable vegetation management can also contribute to maintaining a mosaic of successional stages. Early successional stages lack horizontal cover, and snowshoe hare densities within them are typically low. However, snowshoe hare populations increase as the vegetation (trees and/or understory trees and shrubs) grows back to provide dense horizontal cover. Hare populations decrease if the stand matures and the lowest limbs of trees grow out of the reach of hares, and/or the understory is suppressed by the stand's closed canopy. A typical example of the importance of fire within the NRLA area is fires' role in a mature stand of lodgepole pine, which provides little snowshoe hare forage. Fire in such stands is typically very hot, resulting in stand replacement. Such stands typically regenerate into large, dense stands of lodgepole pine seedlings and then saplings, which provide quality snowshoe hare habitat. Low to moderate intensity fires also may stimulate understory development in older, mixed conifer stands.

Fire exclusion may have altered the pattern and composition of vegetation in some lynx habitat within the action area (Hillis 2003; Losensky 2002). Others suggest that fire suppression has not been as significant in lynx habitat vegetation types as in other regimes (Agee 2000). Within nondevelopmental land allocations (67 percent of lynx habitat in the NRLA area) (see Table 5), natural processes are expected to predominate. In these areas, fire would continue to play a significant role in creating natural mosaics of vegetation valuable to lynx.

The direction and intent in the LCAS for wildland fire management is well represented in the proposed action, although direction formerly found in one standard and a guideline was integrated into vegetation management objectives. The amendment clarifies vegetation management objectives **VEG O1**, **O2**, and **O4**, and **VEG O3** (specific to fire use) remains unchanged. All are consistent with the direction in the LCAS to restore fire as a natural

ecological process in lynx habitat. These objectives are attained through application of the vegetation management standards and guidelines described earlier. The objectives for vegetation management would provide guidance to allow fire to contribute to sustaining snowshoe hare habitat in all occupied lynx habitat (both core areas and occupied secondary area), and thus would improve the reproduction, numbers, and distribution of lynx in the core areas (and all occupied lynx habitat) in the NRLA area. This would avoid an appreciable reduction in the reproduction, numbers and distribution with the NRLA area.

Landscape Patterns In general, the proposed action would promote forested landscape patterns that maintain or restore lynx habitat. This positive effect would occur everywhere but the lands associated with the fuel and vegetation management exceptions discussed previously. As discussed earlier, lynx use a variety of forest age and structure classes within dynamic forest ecosystems. Snowshoe hares generally reach highest abundance in younger seral stages, although mid- to late seral, multistoried forests provide lynx foraging and denning habitat and produce both snowshoe hares and red squirrels. Multistoried forests provide important snowshoe hare habitat during the winter months, providing forage and thermal and hiding cover. The spatial and temporal interspersion of habitat is influenced both by natural disturbance events, such as wind and wildland fire, and by vegetation management activities, including timber harvest and prescribed fire. Because lynx occur at low densities and occupy large home ranges, conservation objectives cannot be achieved on small parcels of land (McKelvey et al. 2000a).

The direction in the LCAS for landscape patterns is well represented in the proposed vegetation management objectives. Vegetation management objectives **VEG O1, O2, O3** and **O4** (described above) are all consistent with the direction in the LCAS. These objectives are attained through application of the vegetation management standards and guidelines.

As described earlier, the proposed action contains a suite of vegetation standards and guidelines that limit vegetation management activities that have the potential to adversely affect important components of lynx and snowshoe hare habitat. Further, **VEG S1** and **S2** limit early stand initiation stages, created by vegetation management such as timber harvest. **VEG S1**, limits young regenerating stands to 30 percent of the LAU in order to sustain a mosaic of age-classes across the landscape. This 30 percent limit is required unless a broad scale assessment is completed to demonstrate a need based on historic levels of early seral conditions. When applied across the landscape, even with six percent of the area exempted for fuels management, this measure and other vegetation standards would collectively result in sufficient lynx habitat being maintained over time to support recovery objectives. The wide-spread application of these measures would provide sufficient habitat to sustain lynx populations in the NRLA area. Although the exceptions and exemptions to vegetation guidance may result in adverse effects to individual lynx (as detailed earlier), vegetation objectives, standards and guidelines would contribute to creating and maintaining landscape patterns that sustain snowshoe hare and lynx populations in core areas and occupied secondary areas, thus on the whole would avoid an appreciable reductions in the reproduction, numbers, and distribution of lynx in the NRLA area.

Denning Habitat Denning habitat is used for parturition and rearing of young. The common component of denning habitat appears to be large amounts of coarse woody debris (Koehler 1990; Staples 1995). This structure is most valuable when distributed throughout the home range, in or near foraging habitat. Coarse woody debris is needed at den sites for cover and shelter for kittens at den sites. Vegetation management activities such as salvage harvesting and prescribed fire may remove existing coarse woody debris and/or affect its recruitment. The proposed action may result in localized effects to denning habitat, mostly through fuels management activities and salvage and timber harvest. These activities may remove existing coarse woody material, which can affect the quality and quantity of available lynx denning habitat.

Recent research in northwestern Montana and elsewhere has shown that lynx use a variety of conditions for dens sites (Squires et al. 2006; Merrill and Shenk 2006; Merrill 2005; McCollough, pers. comm. 2007; BA). Most sites occurred in mature to older stands but younger stands were also used, all providing structure by large downed trees, smaller logs in wind-thrown tree piles, slash piles; even talus was used for den sites. In the northeast United States, lynx dens were found in a several stand types including softwood mid/late regeneration, mature forest mixed regeneration, mature softwood, other regeneration, and hardwood/softwood mid/late regeneration (M. McCullough, pers.comm. 2007). The structural components of lynx den sites are common features in managed (logged) and unmanaged (spruce budworm damaged areas, wind-throw) stands. Tip-up mounds (root wads) were the most common predictor of den sites in Maine. Across the range of lynx, information indicates that the key component for suitable lynx denning habitat appears to be horizontal structural.

On the whole, the best information suggests that Forest Service management conducted under current Plans has resulted in conditions that provide adequate denning habitat. Since publication of the 2000 LCAS, lynx studied in the United States have been shown to use a variety of sites and conditions for denning. The common factor appears to be dense cover for kittens, typically provided by downed wood and/or debris. These habitat elements are generally found distributed across National Forests. Lynx denning sites are not believed to be a limiting factor in Montana and Maine study areas (J. Squires, pers. comm. *in* BA; M. McCollough, pers. comm. 2007). Further, earlier assessments also concluded that in most geographic areas, denning habitat was not likely limiting to lynx, and existing Plan direction would not result in adverse effects (Hickenbottom et al. 1999). Within nondevelopmental land allocations (e.g., wilderness, roadless, late successional reserves), denning habitat would likely be maintained at or above levels that occurred historically. Thus, only in exceptional circumstances would an LAU lack of denning habitat.

Similarly we do not anticipate that vegetation management under the proposed action would result in a lack of denning habitat within an LAU. The 2000 LCAS contained prescriptive and somewhat redundant standards and guidelines for denning habitat. The Forest Service proposes to minimize the potential for lack of adequate denning habitat through **VEG G11**, which condenses the direction found in two LCAS standards and three guidelines for retention of denning habitat into a less prescriptive guideline specific to denning habitat. **VEG G11**, which states that denning habitat should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads, or large piles of small wind thrown trees (“jack-strawed” piles). If denning habitat appears to be lacking in the LAU, then projects should be designed to retain some coarse woody debris, piles, or residual trees to provide denning habitat in the future. Further, **VEG G1** states that vegetation management projects should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available. Priority should be given to stem-exclusion, closed-canopy structural stage stands for lynx or their prey (e.g. mesic, monotypic lodgepole stands). Winter snowshoe hare habitat should be near denning habitat. This direction is similar to that recommended in the LCAS, but has changed from standards to guidelines. Objectives **VEG O1, O2, O3, and O4** and implementing standards **VEG S1, S2, and S6**, also indirectly promote the development and retention of the structure needed for denning habitat, distributed across the landscape, through vegetation management that promotes a mosaic of stand types across the landscape.

In most cases, denning habitat is not known to be limited within lynx habitat on federal lands within the NRLA area, and the vegetation management objectives, standards and guidelines either directly or indirectly promote the development and retention of adequate amounts of denning habitat. Therefore projects are unlikely to reduce denning structure to levels that result in adverse effects to lynx. In the infrequent cases where denning habitat is limited in an LAU, or projects would result in substantial reduction of denning structure, **VEG G11** would be followed in most cases. The number of projects leading to adverse effects on lynx due to lack of denning habitat is expected to be very few. The vegetation objectives, standards and guidelines would contribute to the generation and maintenance of adequate denning habitat within lynx habitat in core areas and areas occupied by lynx, sustaining lynx populations in core areas and occupied secondary areas, thus on the whole would avoid an appreciable reductions in the reproduction, numbers, and distribution of lynx in the NRLA area.

Habitat Conversions Forest management activities can result in conversion of vegetation types. For example, silvicultural prescriptions might be designed to change species composition to favor western larch, which has a high economic value, at the expense of lodgepole pine, which has low economic value but provides better winter habitat for snowshoe hare. This kind of type conversion could reduce lynx foraging habitat.

The proposed action includes objectives similar to those recommended in the LCAS to reduce the potential for adverse effects to lynx from type conversions of habitat. Vegetation management objectives **O1, O2, O3** and **O4** (described above) are all consistent with the intent of objectives in the LCAS to minimize habitat conversions. The LCAS did not contain standards or guidelines specific to habitat conversions. The LCAS objectives were to be attained through application of the vegetation management standards and guidelines, similar to the direction in the

proposed action. With the application of these measures, we do not anticipate that the proposed action would adversely affect lynx via habitat conversions within the NRLA area. Attainment of the vegetation management objectives through projects designed using vegetation management standards and guidelines would support lynx survival and recovery.

Forest Roads Lynx are known to have been killed by vehicle-collisions in Colorado (reintroduced lynx population; paved, high-speed highways), in Minnesota (paved, high-speed highways) and in Maine (high-speed, relatively straight gravel roads on flatter terrain). The best information suggests that the types of roads managed by the Forest Service in the NRLA area do not likely adversely affect lynx. Lynx mortality from vehicle strikes are unlikely, and to date have not been documented, on National Forest lands in the NRLA area given the relatively slow speeds at which vehicles on these roads travel (due to topography and road conditions) and generally low traffic volumes.

Unlike paved highways, Forest roads rarely receive motorized use at levels that create barriers or impediments to lynx movements. Lynx have been documented using less-traveled roadbeds for travel and foraging (Parker 1981; Koehler and Brittell 1990). Recreational, administrative, and commercial uses of forest roads are known to disturb many species of wildlife (Ruediger 1996). However, preliminary information suggests that lynx do not avoid roads (Ruggiero et al. 2000b), except at high traffic volumes (Apps 2000). Lynx show no preference or avoidance of unpaved forest roads, and the existing road density does not appear to affect lynx habitat selection (McKelvey et al. 2000c). Most investigations indicate that lynx do not alter their behavior to avoid human activities (Staples 1995; Roe et al. 1999; Aubry et al. 2000; Mowat et al. 2000; J. Squires, pers. comm. 2006 *in BA*). Human access via Forest roads can increase the potential for mortality or injury of lynx captured incidentally in traps aimed at other species or through illegal shooting. Lynx harvest seasons closed due to listing in 2000. Some trapping incidental to other fur bearer seasons occurs (MDFWP *in litt.* 2006). Road densities may contribute to this factor. National Forests have road density standards for various resource objectives. For instance, within the grizzly bear recovery zones in Montana, Idaho and Wyoming, lynx would benefit from road limits for grizzly bear management or where roads are limited or closed for big game management. In roadless and wilderness areas, roads are not present.

The LCAS included several guidelines related to addressing potential impacts of forest roads, including upgrading, cutting and brushing and public use. These guidelines generally discourage improving road access for people or reduce the likelihood that people would see lynx near roads. Most of these LCAS guidelines have been retained in the amendment, **HU G7, G7, G8, G9**, with modifications of guideline **HU G6**. The guideline in LCAS directed to avoid upgrades to levels 4 or 5, while the amendment directs that methods to reduce effects to lynx should be used when upgrading.

At the time of the 2000 BO, forest roads were thought to potentially impact lynx due to the potential that snow compaction could allow lynx competitors into deep snow habitats. Thus, the one LCAS standard pertaining to forest roads focused on snow compaction. However, research has provided no conclusive evidence that snow compacted routes adversely affect lynx or their habitats, including research conducted within the NRLA area. This LCAS road standard was

changed to a guideline, and is included under winter dispersed recreation, discussed later under *Winter Dispersed Recreation*.

To reduce the potential effects of roads on lynx, the amendments retained the road management guidance recommended in the LCAS. The objectives and guidelines reduce or minimize the impacts of forest roads on lynx, which would avoid appreciable reductions in the reproduction, numbers, and distribution of lynx in core areas and all occupied habitat, and within the NRLA area.

Developed Recreation We anticipate that the proposed action related to developed recreation would limit adverse effects to lynx. Most investigations indicate that lynx do not alter their behavior to avoid human activities (Staples 1995; Roe et al. 1999; Aubry et al. 2000; Mowat et al. 2000). The exception may be activities that would cause abandonment of a den site, possibly affecting kitten survival (Ruggiero et al. 2000). However, lynx are known to move kittens from natal to rearing den sites, sometimes moving kittens several times during rearing. Further, if an area were disturbed to levels that impact lynx denning, it is unlikely lynx would select the site for denning in following years. Den sites are typically not re-used year to year and denning habitat does not appear limited in the action area (J. Squires, pers. comm. 2006 *in BA*).

Developed recreation can result in direct loss of lynx habitat and associated development of the surrounding area. Large developed sites, such as four-season resorts, alters lynx habitat, results in direct loss of lynx habitat on the footprint of the development itself, and may fragment the landscape depending upon size and location. Resort developments result in permanent loss of lynx habitat through the development of permanently groomed runs and resort infrastructure, such as lift termini, buildings and roads. Potential lynx habitat within resorts receive very high levels of use by people, which likely reduces use by lynx use. However, collectively, ski resorts currently impact only a small proportion of lynx habitat; a total of 24 downhill and cross-country ski areas affect about 17,459 acres of occupied lynx habitat within the NRLA area (Table 5, Appendix D). Eight of these have plans for expansion and one new ski area is being planned. Developed recreation sites such as ski areas and warming huts may encourage snow compaction in lynx habitat. Some loss of lynx habitat is unavoidable with development, but at Forest or larger scales, relatively small areas are affected.

The most serious impact of ski or four-season resort development is the associated private land development at the base, with resulting increases in highway traffic, speeds, and surrounding development. Such development can impact connectivity between areas of lynx habitat, typically valley bottoms between mountain ridges. Lynx may avoid areas with concentrated housing, roads, busy highways, and business parks. Higher traffic volumes and speed may impede or create barriers to lynx movement, and may somewhat increase the likelihood of lynx mortality through vehicle collision, although this impact is rarely documented outside of lynx re-introduction areas.

The direction and intent of the LCAS regarding developed recreation is well represented in the amendment. The proposed action retained LCAS objectives and standards that address the most serious consequence of development, requiring new or expanding permanent developments to maintain or where possible, promote habitat connectivity within LAUs and linkage areas (**All**

O1, All S1, LINK O1, and LINK S1). The proposed amendment retained LCAS guidelines to further promote connectivity (**All G1**). Further, the proposed amendment retained several guidelines that reduce impacts within the development itself, including: adequately sized inter-trail islands that support winter snowshoe hare habitat (**HU G1**), providing nocturnal foraging opportunities for lynx that are consistent with the ski area's operational needs, especially where lynx habitat occurs as narrow bands of coniferous forest across mountain slopes (**HU G2**), and providing for lynx movement and maintenance of the effectiveness of lynx habitat (**HU G3**). These guidelines were not changed from those in the LCAS. Although the LCAS included a standard for maintaining and providing diurnal security habitat, there is no evidence that diurnal security habitat is required by or, where it occurs on ski areas, is used by lynx. The proposed action changed this LCAS standard to a guideline in the amendment (**HU G10**).

With the application of these objectives, standards and guidelines, we anticipate that many adverse effects of developed recreation on lynx would be minimized under the proposed action. Based on evidence suggesting lynx are fairly tolerant of human activity (e.g. Roe et al. 2000), some use of large ski areas, or immediately adjacent areas, by lynx may be possible. If lynx use is precluded by habitat alteration or excessively high levels of human activities, standard **ALL S1** addresses the most significant adverse effect of developed recreation on lynx populations. Neither the LCAS nor the proposed action prohibits the development of recreation sites on National Forest lands, therefore individual lynx may be adversely affected by developed recreation through habitat avoidance, alteration or loss. However, the total area affected by the existing 24 sites is currently 17459 acres. Some of these developments have expansions planned and only one new site is being planned (BA). Where expansions develop substantial amounts of habitat outside the existing footprint of development, adverse effects through habitat loss are expected. However, even with these expansions, the amount of habitat altered or lost is unlikely to impact the lynx population within the NRLA, given approximately 12.5 million acres of lynx habitat within the action area. Therefore, although individual lynx may be adversely affected by recreation development actions, the Plans as a whole would have objectives, standards and guidelines to reduce potential project impacts and overall impacts at a landscape scale, and thus would avoid an appreciable reduction in the reproduction, numbers, and distribution of lynx in the NRLA area.

Non-winter Dispersed Recreation Due to the low susceptibility of lynx to displacement by humans, this activity presents low risk of adverse effects except possibly for disturbance near den sites. Because plans in the NRLA area generally already provide for adequate and widely distributed denning habitat (Hickenbottom et al. 1999), no adverse effects were identified related to non-winter dispersed recreation. Dispersed recreation often occurs along hiking trails through forested areas and well-used, if not designated camp sites. Human-created disturbance near such areas is fairly predictable and if disturbance occurred at levels affecting lynx or their dens, it is unlikely that lynx would den near such established sites at all. Further, lynx could move their kittens to an alternate site and/or would likely avoid denning in these areas in following years. Lynx den sites are not easily detected in forests and unlikely to be noticed by recreationists. Lynx are rare, as such are den sites are very rare. The likelihood that dispersed recreation on or off trails would occur in proximity of a den site, and/or that the dispersed recreation activities occurring would actually disturb a lynx den site or in other ways adversely affect lynx is so low as to be discountable and effects. Further, the intent of the LCAS standard to ensure landscape

connectivity in recreation projects is found in the proposed action in **All O1 and All S1**. Therefore, non-winter dispersed recreation activities are not likely to adversely impact lynx, nor result in adverse impacts to the lynx population in the NRLA area.

Winter Dispersed Recreation Dispersed recreational uses and activities, such as snowmobiling, cross-country skiing, and snowshoeing are increasing within higher elevation environments. These activities are unlikely to have direct adverse effects on lynx. Most investigations indicate that lynx do not alter their behavior to avoid human activities (Staples 1995; Roe et al. 1999; Aubry et al. 2000; Mowat et al. 2000).

Some researchers hypothesized that the presence of compacted snowmobile trails may allow coyotes to access lynx habitat from which they were previously excluded by deep, unconsolidated snow, which may negate the competitive advantages of lynx over coyotes and other predators during the winter (Buskirk et al. 2000, Murray and Boutin 1991, Bunnell et al. in press). Research documents that coyotes use compacted snow routes, or often select for shallow or more supportive snow conditions (Thibault and Oullet 2005), and scavenge for carrion, and/or prey on snowshoe hare and other small mammals during the winter (Kolbe and Squires in press; Shirley 2005; Staples 1995; O'Donoghue 2001).

The range of lynx and coyotes overlap in many regions of Canada and the United States. The range of lynx is restricted to forested areas with deep snow conditions during the winter. Lynx evolved in and are highly adapted to a boreal forest environment. Morphologically, lynx are well-adapted to hunting snowshoe hares in deep snow (Murray and Boutin 1991) in densely forested environments. Lynx have very large feet in relation to body mass, which prevents them from sinking deep into snow. This provides lynx with an inherent competitive advantage over many other mammalian carnivores in deep snow conditions. Their primary prey, snowshoe hare are also adapted to living in dense boreal forests in areas with abundant snow. Within the last century, coyotes have expanded their range from western and central prairie regions in North America to forests of the east and far north. Morphologically, coyotes are at a disadvantage hunting in high snow areas, as their feet are fairly small in relation to body mass and they therefore sink into soft snow (Murray and Boutin 1991).

Dietary and habitat-use overlap influences competition between predators. Much of what is known of lynx diet in the NRLA comes from recent studies in Montana. As in many areas across the range of lynx, lynx in Montana preyed almost exclusively on hares in the winter (Squires and Ruggiero in press) and so a significant depletion of hares by coyotes during winter could adversely affect lynx (Kolbe and Squires in press). Squires and Ruggiero (in press) noted that the lynx use of alternate prey may increase as hares become scarce, but not at the hare densities they observed during 1998 to 2002. In areas of Canada where hares are abundant and hare populations cycle, lynx switched to red squirrels during cyclic hare lows (O'Donoghue et al. 2001). In the United States, snowshoe hare habitat becomes more fragmented as habitats becomes drier, and thus hare densities are significantly lower than in Canada. Hodges (2000) reports that hares may be cyclic in southern areas, although with peak and low densities lower than those in the north. Thus, snowshoe hare densities are relatively and consistently lower across lynx range in the United States, including the NRLA. Snowshoe hares are the primary prey of lynx and thus throughout their range in the United States, lynx occur at inherently low

densities compared to Canada. Coyotes are known as generalist predators, using a diverse selection of mostly small mammal prey, as well as carrion. Where hares are abundant, hares may also be a primary component of coyotes' diet (O'Donoghue et al. 2001). Coyotes are highly adaptable carnivores, although researchers have noted that in several studies, forests appear suboptimal habitat for coyotes (see Thibault and Quillet 2005 and O' Donoghue et al. 2001).

Bunnell et al. (in press) suggested that their results indicated that snow compacted routes increased coyote presence in their study areas in Utah and Wyoming, thereby suggesting that compacted routes would increase coyotes' competition with lynx for snowshoe hare, if lynx were present. They also concluded that "restrictions placed on snowmobiles in lynx conservation areas by land management agencies because of the potential impacts of coyotes may be appropriate". However, in northwestern Montana (within the northern lynx core area) Kolbe and Squires (in press) concluded "little evidence that compacted snowmobile trails either facilitated coyote movements on our study area or that snowshoe hares provided a large proportion of the coyote's winter diet. It is unlikely that compacted snowmobile trails increased exploitation competition between coyotes and lynx during winter on our study area." Kolbe and Squires (in press) suggested that compacted snow routes did not appear to enhance coyotes' access to lynx and hare habitat, and so would not significantly affect competition for snowshoe hare. They found that coyotes used compacted snow routes for less than 8 percent of travel, suggesting normal winter snow conditions allowed access by coyotes, regardless of the presence or absence of compacted snow routes. Bunnell indicated that "circumstantial evidence" suggested the existence of competition. Kolbe was able to directly measure relationships between coyotes, compacted snow routes and snowshoe hare in an area that also supports a lynx population. Coyote diet was made up of large portions of carrion (over 60 percent) scavenged mostly along or near trails in the Uinta Mountains in Utah (Shirley et al. 2005), and similarly mostly ungulate carrion (over 60 percent) but not nearer to trails than expected in Montana (Kolbe and Squires in press). Analysis of coyote scat in each study area also revealed similar amounts of snowshoe hare (about 16 and 12 percent respectively). Advantages of Kolbe and Squires (in press) include a rigorous scientific methodology (e.g. a systematic random coyote sample, coyote population was sampled evenly across a large number of known individuals; radio-collared coyotes to locate individuals and begin backtracking in an unbiased manner; a rigorous quantification of coyote adjacency to all available packed snow routes; quantification of habitat use and daily availability of compacted snow routes; and GPS and GIS data to describe coyote use of and adjacency to trails).

The ecology of multi-species predator and prey relationships across the range of the boreal forest is complex. O'Donoghue et al. (2001) provide a comprehensive summary and integration of research from several study areas, and conclude they found in their findings "value as much in suggesting hypotheses as in providing answers," indicating there is much still to be known regarding the relationships and responses of these competing predators. They note that the question of how these two predators survive using a very limited resource base is "especially interesting." Even with high or complete overlap in resource use, recent models of competition have suggested that species may coexist for long periods of time (Hubbell and Foster 1986, MacNalley 1995 in O'Donoghue et al 2001). No research to date has documented a decline in lynx populations due to competition by coyotes. Further, the degree to which coyotes and lynx compete for snowshoe hares in the western United States is unknown (Kolbe and Squires in

press). The impact of competition by coyotes on lynx population is probably influenced by many variables including snowshoe hare abundance, alternate prey species, alternate prey abundance, availability of carrion, and several habitat variables including quality of snowshoe hare habitat, the extent of forest openings, and winter snow conditions over time.

To date, research has confirmed that lynx and coyote populations coexist, despite dietary overlap and competition for snowshoe hare, the primary prey of lynx, and alternate prey species. In some regions and studies, coyotes were found to use supportive snow conditions more than expected, but none confirm a resulting adverse impact on lynx populations in the area. The best scientific information from within the NRLA area in an area populated by both lynx and coyotes concludes that coyotes did not require compacted snow routes to access winter snowshoe hare habitat. In our final rule (March 24, 2000; 65 FR 16052), snow compaction created by human activities was not found to be a threat to the lynx DPS. In our 2000 and 2003 finding we concluded there is no evidence that any competition may exist between lynx and other species that exerts a population-level impact on lynx. We also have no evidence that packed snow trails facilitated competition to a level that negatively affects lynx or lynx populations. Neither factor is considered a threat to lynx populations, but may possibly have adverse effects on individual lynx depending upon the situation.

The proposed action includes an objective (**HU O1**) to maintain the lynx's natural competitive advantage over other predators in deep snow, by discouraging the expansion of snow-compacting activities in lynx habitat. The proposed action changes an LCAS standard for no net increase in compacted snow routes, unless it consolidates use, to a guideline stating that "compacted-snow areas should not expand outside baseline areas of consistent snow compaction, unless designation serves to consolidate use and improve lynx habitat" (**HU G11**). This measure directly addresses the hypothesis that the area impacted by coyotes (or other competitors) in deep-snow areas is related to the spatial arrangement of compacted snow routes. The guideline would reduce the potential for significant increases in the area influenced by compacted snow routes. Similar to the direction in the LCAS, the proposed action would continue to limit the expansion of winter dispersed recreation activities within lynx habitat. Further, guideline **HU G12** limits winter access for mineral and energy exploration and development to designated routes. Finally, the proposed action requires mapping and monitoring of snow compacting activities and designated and groomed routes at five-year intervals.

The Service concludes that the proposed guideline would be sufficient to maintain habitat effectiveness for lynx by limiting the expansion of compacted snow routes, and our conclusion would be tested through monitoring required in the Plans. The best information available has not indicated that compacted snow routes increase competition from other species to levels that adversely impact lynx populations, and under the proposed action, the amount of areas affected by snow compacted routes within the NRLA would not substantially increase. Thus the proposed action would allow projects that may adversely affect individual lynx in some specific cases, however the proposed action as a whole would avoid appreciable reductions in the reproduction, numbers, and distribution of lynx in core areas and all occupied habitat, and in the NRLA area.

Minerals and Energy Mining and energy development may directly impact habitat and can attract recreational activity (primarily snow compacting activities) into certain areas. As described earlier, the promotion of recreational activities is unlikely to adversely affect lynx. However, new development could result in small, localized losses of lynx and snowshoe hare habitat. The proposed action contains the following three guidelines that would minimize the potential impacts of mineral development on lynx by calling for management to reduce impacts on lynx and lynx habitat (**HU G5**), and encourage remote monitoring to reduce snow compaction (**HU G4**). These guidelines have not changed from the LCAS. An LCAS standard limiting winter access to designated routes was changed to a guideline in the amendment (**HU G12**). The direction and intent in the LCAS is well represented in the proposed action. With the application of these measures, the proposed action would result in no or only minor adverse effects to lynx depending upon the scale of development and potential loss of habitat. Therefore, the effects of minerals and energy development across the NRLA area would not appreciably reduce reproduction, numbers, and distribution of lynx.

Coordination/Connectivity Coordination among different land management agencies is important to recovery of lynx because lynx have large home ranges and may move long distances. Without coordination, the effects of highways and mixed land ownership patterns on lynx are likely to contribute to increased mortality on highways and reductions in habitat connectivity. Although the proposed action has measures to directly address coordination (coordination is already required under existing Forest management direction), the Forest Service is a lead member in the interagency Lynx Steering Committee and the Lynx Biology Team, and played a key coordination role for the Lynx Science Team.

Connected forest habitats allow lynx to move long distances to find food, cover, and mates. Because of the large amount of lynx habitat in the action area, the Forest Service has the ability to impact connectivity through the proposed action. The proposed action includes measures that would address the connectivity issue by requiring new or expanded permanent developments and vegetation management projects to maintain habitat connectivity in an LAUs and linkage areas through standard **All S1**, and by identifying potential highway crossings when highway or forest highway construction or reconstruction is proposed in linkage areas through standard **LINK S1**. This direction was found in the LCAS, and to that end the Forest Service led and completed an interagency effort that resulted in a map of potential lynx linkage areas for the NRLA area produced by a team of representatives of federal, state and tribal agencies (<ftp://ftp2.fs.fed.us/incoming/r1/ro/lynx/lynxhab21x27bw.pdf>).

Livestock Snowshoe hare densities and overwinter survival appear to be positively correlated with understory density (Adams 1959, Wolff 1980, Litvaitis et al. 1985). Livestock may compete with snowshoe hares for forage resources (Ruediger et al. 2000). Browsing or grazing also could impact plant communities that connect patches of lynx habitat within a home range. Conversely, appropriate grazing management can rejuvenate and increase forage and browse in key habitats such as riparian areas. We found no evidence that grazing was a factor threatening lynx, therefore, grazing was not addressed in the final listing rule (March 24, 2000; 65 FR 16052). There is no existing research that provides evidence of lynx being adversely affected by grazing within the NRLA or elsewhere, or of lynx movements within home ranges being impeded by grazing practices. Given the previous discussion of lynx dispersal movements, it is unlikely that grazing would impede lynx movements for dispersal or breeding. Accordingly, the proposed action changes LCAS grazing standards to guidelines. The proposed action would continue to reduce the potential for grazing to adversely affect lynx through guidelines for grazing management practices that provide for the regeneration of trees, shrubs and aspen clones in lynx habitat. These guidelines, formerly LCAS standards, should adequately minimize the potential for adverse effects of grazing to lynx, and may improve the habitat over baseline conditions: manage livestock grazing to allow regeneration in fire- and harvest-created openings (**GRAZ G1**); contribute to the long-term health and sustainability of aspen (**GRAZ G2**); maintain or achieve a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes in riparian areas and willow carrs (**GRAZ G3**); and contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes in shrub-steppe habitats (**GRAZ G4**). With the application of these measures in most cases, the proposed action would result in no effects or discountable effects to lynx as a result of grazing. Therefore, effects of grazing across the NRLA area would be minimal and would not appreciably reduce reproduction, numbers, and distribution of lynx in core areas or all occupied habitat, or in the NRLA area.

Effects of the Proposed Action in Relationship to Recovery

The action area includes all or part of the following areas identified in recovery outline for lynx (U.S. Fish and Wildlife Service 2005): the Northwestern Montana/Northeastern Idaho core area; the Greater Yellowstone core area; the southwestern Montana secondary area; and peripheral lynx habitat in Utah and Wyoming. Only the core areas currently have a clear role in recovery (lynx recovery outline); the secondary and peripheral areas may be important for periodic population expansion and connectivity.

The Forest Service proposes to amend the Plans of all 18 Forests in the NRLA, but require application of the amendment only in areas occupied by lynx. The direction in the amendment would be “considered” in areas with unoccupied lynx habitat, but would not be mandatory, until such time, if ever, the area becomes occupied by lynx.

Twelve Forests within the NRLA area are occupied (U.S. Forest Service and U.S. Fish and Wildlife Service 2006) by lynx (Appendix A). All core area is occupied by lynx, consisting of

nine Forests that are entirely or partially in core areas. Three Forests, within secondary areas only, are occupied as well-. For those Forests or portions of Forests that are occupied the amendment would be fully implemented.

Four Forests are in secondary areas only and are unoccupied by lynx (Appendix A). These Forests include the Beaverhead-Deerlodge, Bitterroot, Nez Perce, and Salmon-Challis. Additionally, the Lewis and Clark, Gallatin and Helena National Forests all manage portions of occupied lynx core area, but also manage disjunct mountain ranges in eastern Montana that occur in secondary or peripheral areas and are unoccupied. For these unoccupied Forests and disjunct mountain ranges, Plans would be amended but the provisions of the amendment would not be implemented until these areas become occupied by lynx.

Two Forests, the Ashley and Bighorn National Forests, are in peripheral areas only and are unoccupied.

Within these Forests (or portions thereof) that are unoccupied, we do not expect the proposed action would adversely affect individual lynx as lynx are not known to be present. However, there may be effects to lynx in the future if lynx use of the areas occurs, or to recovery if these areas are ultimately found to be essential to recovery by supporting resident lynx populations. The recovery plan suggests that secondary areas are important in providing connectivity between blocks of core area. Connectivity may be evaluated through an assessment of how habitat characteristics and management would facilitate lynx dispersal through an area, or even of how it might accommodate occupation of an area by low numbers of lynx.

The role of core, secondary and peripheral areas to recovery of the DPS is described in the recovery outline: “Focusing lynx conservation efforts on these core areas will ensure the continued persistence of lynx in the contiguous United States by addressing fundamental principles of conservation biology:

- 1) Representation by conserving the breadth of ecological settings of the distinct population segment;
- 2) Redundancy by retaining a sufficient number of populations to provide a margin of safety to withstand catastrophic events; and
- 3) Resiliency by maintaining sufficient numbers of animals in each population to withstand randomly occurring events and prey population dynamics.”

As described in the recovery outline (Service 2005), the importance of core areas to lynx recovery is well established, however “the role of areas outside core in sustaining lynx populations in the contiguous United States unclear. The fluctuating nature of lynx population dynamics and the ability of lynx to disperse long distances have resulted in many *individual* occurrence records outside of core areas, without accompanying evidence of historic or current presence of lynx *populations* [emphasis added]. Areas classified as “secondary areas” are those with historical records of lynx presence but no record of reproduction; or areas with historical records and no recent surveys to document the presence of lynx and /or reproduction. If future surveys document presence and reproduction in a secondary area, the area could be considered for elevation to core. We hypothesize that secondary areas may contribute to lynx persistence by

providing habitat to support lynx during dispersal movements or other periods, allowing animals to then return to “core areas”. In “peripheral areas” the majority of historical lynx records is sporadic and generally corresponds to periods following cyclic lynx population highs in Canada. There is no evidence of long-term presence or reproduction that might indicate colonization or sustained use of these areas by lynx. However some of these peripheral areas may provide habitat enabling the successful dispersal of lynx between populations or subpopulations. At this time, we simply do not have enough information to clearly define the relative importance of secondary or peripheral areas to the persistence of lynx in the contiguous United States.”

The recovery outline is clear in its emphasis on the need to manage lynx habitat within core to support recovery of lynx in the DPS. Focusing lynx conservation efforts on core areas will ensure the continued persistence of lynx in the contiguous United States. The previous sections analyzed how the proposed action would conserve lynx and lynx habitat within core areas as well as within currently occupied secondary areas.

The recovery outlines indicates a need for “research to determine the role of secondary areas in ensuring the persistence of lynx in both the contiguous United States and individual core areas”, and “based on results, adjust core and secondary area designations as appropriate” (recovery action 5.5.2). Secondary areas have fewer and more sporadic current and historic records of lynx than core areas, and no records of reproduction. This evidence suggests that historical lynx abundance was likely relatively low. The quality and quantity of lynx habitat in secondary areas is less clear, but habitat in secondary areas in the NRLA area generally becomes drier and patchier as it extends south, or lower in elevation. The recovery outline indicates that one hypothesis for the lack of lynx in unoccupied areas is that lynx were extirpated because of changes in vegetation structure resulting in poor prey populations, or due to past trapping, and the area has not been recolonized by lynx. On Forest Service land, the Service has reviewed no information related to habitat condition in LAUs in unoccupied secondary area that suggests that past vegetation alteration in lynx habitat was so severe as to reduce prey populations to levels that lynx would be extirpated. Further, lynx trapping in the NRLA area ended ten years ago or longer in Utah (1974), Wyoming (1973) and Idaho (1996), and was severely curtailed through a quota system in Montana beginning in the mid-1990s, ending altogether when lynx were listed in 2000. Further, our 2000 final rule (65 FR 16052) details how, in evaluating trapping harvests compared to anomalous cyclic highs in lynx populations in the 1960s and 1970s, overtrapping does not appear to have caused major declines in lynx populations in the contiguous United States.

As indicated earlier, National Forests mapped lynx habitat beginning in 1999, using the best available information on lynx and the best available mapping technology. The accuracy and precision of mapping methods varied among Forests. In some cases, lynx habitat may have been “overmapped”. As projects are planned, these maps are typically ground-truthed by biologists, in some cases with assistance from the Lynx Biology Team and lynx scientists (J. Claar, pers. comm. 2007). In the past, several areas of previously mapped lynx habitat were found to lack lynx habitat of sufficient quality or quantity to sustain use by lynx. In such cases, some LAUs were dropped altogether and in others, lynx habitat was more accurately delineated, usually resulting in a reduction of mapped habitat. As further investigation informs our mapping efforts, it may be determined that some of the unoccupied secondary area has lynx habitat that is of

poorer quality or occurs in less abundance than originally believed, which is a reasonable explanation for the poor historic record of lynx in the area.

Peripheral areas were identified based on sporadic records of lynx presence that generally occurred following cyclic declines of peak lynx numbers in the northern (Canadian) lynx populations. There is no historical evidence of lynx “populations” in peripheral areas (e.g. no reproduction documented, nor long term presence of multiple animals in these areas). The NRLA area includes two larger blocks of peripheral area, the Bighorn and Ashley National Forests, and two small mountain ranges in eastern Montana (see Appendix B). Compared to areas within the contiguous United States with strong historical presence of lynx populations, these peripheral areas evidently played a relatively minor role in sustaining lynx a population over time, and likely primarily facilitated dispersal between areas of more suitable habitat. Lynx habitat in peripheral areas were also mapped during the same process as described above for secondary areas, and so the same limitations apply.

The recovery outline identifies four recovery objectives. Below, we analyze the extent to which the proposed action addresses the recovery objectives:

Objective 1: Retain adequate habitat of sufficient quality to support the long-term persistence of lynx populations within each of the identified core areas.

To summarize, we conclude that the proposed action fulfills this objective and adequately manages the two core areas within the NRLA to support lynx recovery. The proposed action would support the long-term persistence of lynx populations within the Northwestern Montana/Northeastern Idaho and Greater Yellowstone core areas, which constitutes one third of the core areas nationwide.

In support of Objective 1, the proposed amendment includes the following direction for all core area (and occupied secondary lynx area) within the NRLA:

- 1) The proposed action includes vegetation management objectives that support this recovery objective, as detailed earlier (**VEG O1, O2, O3, and O4**).
- 2) The proposed action would maintain a mosaic of early to late forest successional stages necessary to support snow shoe hare and lynx. No more than 30 percent of lynx habitat within an LAU would be in stand initiation structural phase, and no more than 15 percent of lynx habitat in any LAU could be changed (harvested) to this stage per decade (**VEG S1 and S2**) (LAUs provide the basic scale within which to measure lynx habitat quality and moderate the impacts of Forest management.)
- 3) The proposed action would preclude a reduction in snowshoe hare winter forage habitat in either stand initiation structural stage (early successional stages) or in older, mature multistoried stands (**VEG S5 and S6**) in at least 94 percent of core and occupied secondary area within the action area.
- 4) Where fuels treatment actions are planned, **VEG S1, S2, S5, and S6** will be considered in designing treatments to reduce adverse effects to lynx (**VEG G10**).
- 5) Exemptions to standards that avoid adverse effects to lynx habitat are limited to fuel reduction treatments within the WUI and would affect no more than six percent of lynx

habitat within the NRLA core areas. It is unlikely that all six percent would be treated, or that all treatments would adversely affect lynx.

- 6) Exceptions to standards that avoid adverse effects to lynx habitat are limited to only those circumstances listed under **VEG S5 and S6**. Collectively, these actions are not likely to occur on more than about 6400 acres per year, and more likely nearer to 2200 acres per year in core areas within the NRLA.
- 7) A number of vegetation management guidelines, as described earlier in this biological opinion, would further reduce potential for adverse effects.
- 8) A large proportion of all lynx habitat within the NRLA area (67 percent) is in non-developmental status, where natural ecological processes are expected to predominate.
- 9) Although not a part of this proposed action, the Forest Service is a lead agency in the multi-agency Lynx/Wolverine Steering Committee, and National Lynx Biology Team. These teams help develop relationships with non-Federal land owners, including the States, and provide a source for non-Federal land management options through the LCAS.

Objective 2: Ensure that sufficient habitat is available to accommodate the long-term persistence of immigration and emigration between each core area and adjacent populations in Canada or secondary areas in the United States.

To summarize, we conclude that the proposed action contributes to this recovery objective in part, although we have concerns related to continued connectivity across the secondary area between the Northwestern Montana/Northeastern Idaho and Greater Yellowstone core areas. Connectivity between the core areas Northern Rockies and Yellowstone is likely important to sustaining lynx at the periphery of its range in the contiguous United States. Connectivity between the United States and Canada appears intact thus far, as the Northwestern Montana/Northeastern Idaho core area is directly adjacent to Canada, and includes Glacier Park along its northeastern edge. Occupied secondary area in northern Idaho abuts the core area and international border in the far northwest region of the NLAA area. Thus, to the extent of Forest Service authority and management, the proposed action meets this objective in part by providing and conserving core area lynx habitat directly adjacent to and continuous with lynx habitat in Canada. Such habitat should accommodate both immigration of lynx from Canada, and emigration from core areas to secondary areas or Canada.

In all core area and occupied secondary area, the proposed action includes objectives to use federal jurisdiction to actively maintain or restore lynx habitat connectivity in and between linkage areas and LAUS, either through federal land management or conservation easements, land exchanges, or other cooperative efforts with private land owners (**All O1, Link O1**). The proposed action contains a standard that applies to all programs requiring new or expanded developments and vegetation management projects maintain habitat connectivity within LAUs and linkage areas (**ALL S1**). The proposed action also includes a standard that requires the Forest Service to identify potential linkage across highways proposed for construction or reconstruction (**LINK S1**). Because these measures would apply in both core and occupied secondary areas, it clearly meets the recovery objective of accommodated long-term connectivity across these broad areas these areas.

The proposed action is less clear in its effects in unoccupied secondary areas, largely situated between the Northwestern Montana/Northeastern Idaho and Greater Yellowstone core areas. The amendment would not be implemented in the secondary area between these two core areas until or unless the areas become occupied by lynx. In the meantime, existing Forest Plan direction would be implemented. Management actions that degrade lynx habitat quality could occur under this direction. It is reasonable to expect that at some point during the life of the proposed action, individual lynx would attempt dispersal across secondary area that is now unoccupied. Lynx are known to travel extensive distances traversing seemingly unsuitable terrain (Mech 1980; McKelvey et al. 2000b). Lynx have been documented as far south from lynx habitat as Iowa, south-central North Dakota, and South Dakota. Many of these occurrences are associated with mid-continent (Canada) irruptions of lynx populations in the 1960s, 1970s and 1980s (McKelvey et al. 2000b).

Information from the Forest Service indicates that the likely impact of projected vegetation management on connectivity in this area may not be excessive (U.S. Forest Service in litt. 2007) (Appendix D and E). Related to key habitat components such as horizontal structure, under existing Plan direction, fuels treatment projects in unoccupied habitat would likely occur in no more than about two to four percent of all lynx habitat (inside and outside the WUI) on any Forest in secondary areas (Appendix E), despite lack of mandatory direction in Plans, because areas within the WUI would likely be treated before other areas (BA). The Forest estimates that during the next ten years, precommercial thinning could occur on 66,870 acres (about 1 percent) with full funding, and more likely would occur on 22,750 acres (0.4 percent) or less with projected funding (see Appendix D, Table 1) of the lynx habitat in the unoccupied Forests in secondary areas. We did not receive projections of timber harvest for these Forests. Timber harvest could result in creating stand initiation phase openings in more than 30 percent of an LAU. However, given the baseline condition of LAUs across all of the NRLA area and recent timber harvest levels (R. Smith, pers. comm. 2007), it is unlikely that timber harvest would create stand initiation conditions in over 30 percent of many LAUs. Hillis et al. (2003) described effects of past timber harvest on the Northern Region of the Forest Service and indicated that no more than about 9.2 percent of National Forest lands were in early seral condition. Overall, Forest Service vegetation management, under existing Plan direction, would not preclude connectivity or opportunistic foraging conditions.

Development is another key factor that may impede lynx movement. On National Forest land, four ski areas occur in unoccupied secondary lynx habitat and affect 3800 acres (about .06 percent of unoccupied habitat in the NRLA); two of the four are planning expansions. As detailed earlier, existing ski areas in the entire NRLA area in general affect only minor amounts of lynx habitat (less than one percent of all lynx habitat) and none impede connectivity of lynx habitat at this time (U.S. Fish and Wildlife Service 2001).

Connectivity for lynx could be more seriously compromised by development such as highway expansions, for instance. Even with implementation of the amendment however, the role of the Forest Service in ameliorating the impacts of highway or private land development are limited. The amendment would however, if it were applicable, require the Forest Service consider land exchanges or acquisition, and coordinate with other agencies to lessen the impacts of development. As described previously, the Forest Service led and completed the effort to

identify key linkage zones across the range of lynx. These areas are identified in both core and secondary areas, and the map is available information for use by Forests and other agencies in secondary areas.

Under the proposed action, the Forests are to “consider” the provisions in the amendment in unoccupied lynx habitat. However, the Plans would allow actions that would degrade lynx habitat in currently unoccupied habitat and Forests’ actions could to a limited extent, aggravate degradation of habitat connectivity because of development through its actions on adjacent Forest Service lands. Nonetheless, given lynx ability to move great distances through varied habitat and terrain, we expect Forest management actions in secondary areas that are currently unoccupied would not likely create total barriers to lynx movement or dispersal. As explained earlier in this opinion, dispersing lynx evidently use a variety of habitats and prey resources compared to lynx attempting to establish a home range and territory. A number of lynx from the reintroduced population in Colorado have dispersed to Idaho, Montana, and South Dakota (T. Shenk, pers. comm. 1007), traveling as far as 1220 kilometers, measured as a straight-line distance. Most of those lynx recaptured, or where carcasses were retrieved, were in good body condition. Some of these lynx evidently crossed the Red Desert region of Wyoming (Kurt Broderdorp, U.S. Fish and Wildlife Service, pers. comm. 2007). It is reasonable to predict that some of those eventually located in Montana or Idaho dispersed across unoccupied secondary areas. Individual lynx also would likely be able to occupy these secondary areas, but at low densities. If evidence of lynx on a Forest was determined to meet one or both of the criteria in the Conservation Agreement (U.S. Forest Service and U.S. Fish and Wildlife Service 2006), the Forest would be deemed occupied and the amendment would be fully implemented, and adverse effects to such lynx would be reduced.

Application of the amendment in secondary unoccupied habitat would ensure habitat conditions of higher quality throughout the unoccupied secondary area. However, given the estimates of projected impacts as described above and the best information available regarding lynx dispersal movements, we conclude that under existing Forest Plan direction, these secondary areas would reasonably be expected to provide adequate connectivity and opportunistic foraging habitat for lynx in unoccupied secondary area to allow dispersal.

Non-federal lands also contain lynx habitat. Although not a part of this proposed action, the Forest Service is a lead agency in the multi-agency Lynx/Wolverine Steering Committee, and National Lynx Biologist’s Team. These efforts facilitate relationships with other Federal and non-Federal land owners, including the States and provide a source for non-Federal land management guidance, through products such as the LCAS and Forest Plans. The Steering Committee would also provide a forum to build and sustain cooperative efforts with Canada to maintain lynx habitat connectivity across the international border, if and when the need arises. Thus, we conclude that the proposed action contributes to this recovery objective, in part.

Objective 3: Ensure that habitat in secondary areas remains available for continued occupancy by lynx.

To summarize, we conclude that the proposed action contributes to this recovery objective in part, although we have concerns related to future lynx habitat conditions in currently unoccupied secondary areas between the Montana/Northeastern Idaho and Greater Yellowstone core areas.

The recovery outline discusses the relative importance of core and secondary areas to lynx recovery. The proposed action would fully implement the amendment in occupied lynx habitat occurring in the secondary area on three National Forests (see Appendix A). The proposed action supports this objective in part by applying the amendment equally in occupied core and secondary area within the NRLA. The proposed action would mandate that occupied lynx habitat in secondary areas in Montana and Idaho, including areas on the Targhee, Clearwater, and Idaho Panhandle National Forests, be managed by the same objectives, standards and guidelines as core areas. This measure would ensure that habitat in currently occupied secondary areas remains available for continued occupancy by lynx.

The Forest Service would “consider” the guidance in the amendment on the four Forests and disjunct mountain ranges in eastern Montana that are unoccupied, but it would not be mandatory. If and when occupancy by lynx is established on a Forest, either through reproduction or at least two verified reports since 1999, the amendment would be implemented in full. The Nez Perce, Salmon-Challis, Bitterroot, Beaverhead – Deerlodge National Forests occur in secondary areas where lynx habitat is unoccupied (Appendix B). Also the Lewis and Clark, Gallatin and Helena National Forests manage disjunct mountain ranges in secondary areas that are also unoccupied by lynx. The amendment would not apply in these areas until the areas are occupied by lynx. There is no assurance in the proposed amendment as to whether these secondary area Forest lands would remain available for continued occupancy by lynx.

In the meantime, management actions could degrade lynx habitat that is currently unoccupied. Appendix D and E (U.S. Forest Service in litt. 2007) contain tables of data pertaining to occupied and unoccupied lynx habitat. The tables identify and quantify, for unoccupied habitat, many of the potential risks to lynx habitat that are projected for the next decade. As described above under recovery objective 2, the information indicates that the likely adverse impacts of anticipated Forest vegetation management activities in these unoccupied areas may not be excessive. Most important in conservation of lynx habitat are key habitat components such as horizontal structure. Fuel treatment projects that reduce horizontal structure in unoccupied habitat would likely occur in no more than two to four percent of all unoccupied lynx habitat (inside and outside the WUI) on any Forest in secondary areas (Appendix E), despite lack of mandatory direction in Plans, because areas within the WUI would likely be treated before other areas (BA). Also, the Forest Service estimates that during the next ten years, precommercial thinning could occur in about one percent with full funding (56,160 of 3.3 million acres), and more likely less with projected funding, of the lynx habitat in each of the unoccupied Forests in secondary areas. Timber harvest could result in creating stand initiation phase openings in more than 30 percent of an LAU. However, the Service has not reviewed any information from these Forests to suggest that timber harvest levels would reasonably be expected to create stand initiation conditions in over 30 percent many LAUs. Vegetation management projects such as

precommercial thinning or timber harvest resulting in more than 30 percent of lynx habitat being in early seral conditions within an LAU, did not occur under the Conservation Agreements. Hillis et al. (2003) analyzed the effect that past timber harvest has historically had on creating these early seral stages, or stand initiation phases, within Forest Service and other lands in Region One. Based upon an analysis that approximated the a multiple LAU scale, a 4th code hydrologic unit, 9.2 percent of National Forest lands and 8.9 percent of lands of all ownerships were in a stand initiation or early seral phase. Only 2.5 percent of the 4th code hydrologic units were determined to have exceeded the LCAS standard that requires management actions change no more than 15 percent of lynx habitat in an LAU to stand initiation phase per decade. Fire was determined to be the dominant influence in creating early seral conditions in lynx habitat. The BA indicates that the analysis was conducted using data from 1986 through 2001, and included years when timber harvest was very extensive in some areas. This indicates that the overall baseline condition of lynx habitat at the regional scale, as related to VEG S1, is in good condition. It also suggests that even without guidance specific to lynx conservation, it is reasonable to expect that timber harvest in LAUs in unoccupied lynx habitat would not likely exceed the limits of vegetation standards VEG S1 and S2 in many cases.

About seventy percent of unoccupied secondary lynx area in the NRLA area is in roadless or wilderness (i.e. nondevelopmental) status where Forest management actions are minimal, and natural processes predominate (see Table 5). Also, as described previously, the Forest led the effort to identify key linkage zones across the range of lynx. These areas are identified in both core and secondary areas, and the map is available information for use by Forests in secondary areas.

Nonetheless, the Plans would allow actions that could adversely affect lynx habitat, and if and when lynx attempt to establish home ranges in secondary area, individual lynx may be affected. Such occupancy could occur if lynx populations in core areas were to expand, as periodically happens in lynx populations in Canada. However, given the estimates of projected impacts described above, nondevelopmental areas, and existing habitat conditions, we believe it is reasonable to expect that some lynx would occupy these secondary areas despite lack of mandatory direction in Plans, but at lower densities than in core. Further, if detected, once lynx occupy a previously unoccupied Forest, the amendment and all objectives, standards and guidelines would apply. In the meantime, Forest Service vegetation management actions may degrade lynx habitat, but the resulting conditions are typically temporary (i.e. not permanent). The risks of most vegetation management actions conducted by the Forest Service, such as timber harvest, precommercial thinning, and other modifications of habitat, are reversible as forests typically regenerate over time, with or without active restoration. We hope to gain more information into the quality, quantity and importance of secondary areas to lynx recovery. In the interim, lynx habitat on National Forests in secondary areas would likely remain available for recovery of lynx over the long-term.

The recovery outline recommends surveys at least every ten years to determine whether unsurveyed secondary areas support lynx populations and adjust secondary and core area designations as appropriate. The Forests have surveyed all unoccupied Forests through the National Lynx Survey, research or other verified records (U.S. Forest Service and U.S. Fish and Wildlife Service 2006), except the Nez Perce National Forest. The Nez Perce National Forest is

being surveyed this winter (2006-2007) to determine whether lynx are present (J. Claar, U.S. Forest Service, pers. comm. 2007). There has been no discussion to date, of adjusting the core designations to include occupied secondary habitat, as the quality of the habitat and the number of lynx that could be supported in those areas is less clear, and reproduction has not been documented thus far.

Ongoing lynx research in the NRLA area has developed a preliminary predictive lynx habitat map that “already appears to be a valuable tool in predicting lynx occurrence and suitable habitat at a broad-spatial scale” (Squires et al. 2006). Once this model is finalized, researchers will build a map of the quantity and distribution of lynx habitat in the region. Similar models have been useful in predicting grizzly bear habitat the NRLA area. Such models, and other information, may be available in the future to inform us of the nature and quantity of currently unoccupied lynx secondary (and peripheral) area, providing information we need to assess the potential value of secondary and peripheral lynx areas to lynx recovery.

The proposed action does not fulfill Objective 3 entirely, as it lacks requirements for further or continued monitoring or surveying of unoccupied secondary area for the amount and condition of lynx habitat and lynx presence, as recommended in the recovery outline. The recovery outline does not specify the agency or entity that should lead the effort for surveys or monitoring. The State, Forest Service, or other entity, or a combination of participants, could assume roles to fulfill the recommendation to survey for lynx presence. However, the Forest Service would be the obvious entity to monitor the amount and condition of habitat in secondary area on national forest lands. It is not clear, and probably unlikely, that the existing direction in Plans that would remain in place on unoccupied Forests, along with the amendment, would fulfill this recommendation.

Given the projected or estimated level of adverse impacts that could affect lynx habitat in unoccupied secondary areas, and the lesser importance of secondary area to lynx recovery (as compared to core area), we conclude that the Forest Service would contribute to this recovery objective, in part, through the proposed action.

Objective 4: Ensure that threats have been addressed so that lynx populations will persist in the contiguous United States for at least the next 100 years.

Although the plans do not apply for 100 years and thus cannot directly fulfill this objective, the proposed action would allow lynx populations to persist on lands within core areas in the action area within the foreseeable future. The proposed amendments address the threat to the DPS, inadequate regulatory measures, within core areas in the NRLA area by limiting, reducing or avoiding the major adverse impacts of federal land management on lynx, as well as several other potential impacts or influences that do not rise to the level of a threat to the DPS. Further, a large proportion of lynx habitat within the NRLA area (67 percent) remains in non-developmental status, where natural ecological processes predominate. Finally, as explained previously, on the whole, unoccupied lynx habitat within secondary and peripheral lynx areas is likely to retain habitat that provides opportunistic foraging habitat and connectivity adequate for dispersal of lynx, despite the lack of specific direction for lynx habitat management.

Summary of the effects of the proposed action

The Forest Service designed the proposed action to address those risk factors to lynx evaluated in the LCAS that were relevant in terms of Forest Plan direction. The LCAS incorporated a comprehensive amount of information, including information contained in the Science Report and other available information on lynx and forest management activities, in the development of risk factors and conservation measures. In the 2000 BO, we determined that if Plans were amended or revised to include the conservation measures in the LCAS, or an equivalent, Plans would provide substantive and measurable direction for the management of lynx habitat and would reduce or avoid the potential for adverse effects on lynx. At that time, the LCAS (along with the Science Report) represented the best information regarding Forest Plan direction and lynx. The BA and this biological opinion considered the information, objectives, standards and guidelines in the LCAS, but also new information relevant to assessing the proposed action's impacts on lynx and lynx habitat.

We have determined that the proposed Plan amendments would incorporate substantial and relevant conservation measures in the LCAS or the equivalent thereof, as modified with updated information or clarified for amendment purposes. The proposed amendment includes protective measures for lynx, where lynx occur, and as such is an improvement over the direction found in the existing Forest Plans. However, since 2000, the Forest Service has been managing its lands consistent with the Conservation Agreement (U.S. Forest Service and U.S. Fish and Wildlife Service 2005 and 2006), which required *deferring* most projects that adversely affect lynx until Plans were amended to conserve lynx overall. The proposed action amends the Plans to conserve lynx and lynx habitat overall, but would allow some projects with adverse effects to lynx to proceed. Therefore, the proposed action is likely to result in adverse effects to individual lynx at higher levels than what has occurred during the past six years under the Conservation Agreements, while providing for the overall conservation of the species at a landscape level.

The majority of adverse effects to lynx from the proposed action would come from fuels management projects within as much as six percent of lynx habitat in the action area (within the WUI) and to a much lesser extent (less than one percent of lynx habitat), from pre-commercial thinning for other resource benefits (Appendices D and E). A limited number of actions where third parties are involved, such as ski area expansions and development, may also have adverse effects on lynx under the proposed action. (The amendment would not affect the level of effects from these types of actions involving third parties during interim management over the past six years, because the Conservation Agreements did not require deferral of projects involving third parties.)

Overall, the proposed action would reduce or avoid the potential for adverse effects in occupied lynx habitat and core areas over the direction in the current Plans. The benefits of the proposed action to lynx come primarily from the incorporation of vegetation management objectives and implementing standards **ALL S1, VEG S1, S2, S5, S6**, and others into the Plans (refer to Appendix B for objectives, standards and guidelines). This suite of objectives and standards clearly conserve snowshoe hare and lynx habitat in all core area, and occupied secondary area in the NRLA area. Research confirms the dependence of lynx on their primary prey, snowshoe hare, and confirms the importance of early and late seral vegetation conditions for hares. Thus,

we consider proper vegetation management on federal lands of primary importance to lynx populations, especially considering that the preponderance of lynx habitat occurs on National Forest lands. Other than vegetation management, many activities authorized by Forests have relatively minor or less substantial impacts on lynx. Although a variety of activities that might seemingly result in disturbance to lynx are allowed under the Plans, such as road use or recreation, most investigations indicate that lynx do not significantly alter their behavior to avoid human activities (Staples 1995; Roe et al. 1999; Aubry et al. 2000; Mowat et al. 2000). The best information suggests that the main influence that Forest Service forest management has on lynx come from actions that impact snowshoe hare numbers through vegetation management and actions that impact lynx habitat connectivity.

Lynx are not known to occur in those areas determined to be unoccupied. However, lynx may occur in currently unoccupied secondary area at some point in the future. The importance of secondary area to lynx recovery is not yet known. The quantity and quality of lynx habitat within unoccupied secondary area varies considerably across the NRLA area, but is generally drier and more fragmented than lynx habitat in core areas. Much of the unoccupied secondary and peripheral area occurs in mountain ranges disjunct from larger blocks of core area. Therefore we expect that lynx would occupy these areas only at very low densities, or only intermittently through time, if at all. Lynx that attempt to establish home ranges may be adversely affected by Forest management actions, as none of the objectives, standards or guidelines would apply if lynx go undetected. The proposed action includes no requirement or direction for surveying currently unoccupied lynx habitat. Lynx that disperse through secondary habitat are not as apt to be adversely affected by Forest actions, as the best information suggests that existing Plan direction likely provides connectivity and opportunistic foraging habitats for dispersing lynx. In any case, relatively low numbers of individuals would be adversely affected by Forest Service actions in unoccupied habitat in the next decade. We base this conclusion on: 1) the naturally low density of lynx in the NRLA area, even in the best habitat (core areas); 2) in recent decades, the lack of an observed increase or expansion of lynx, such as that which occurred in the early 1960s and again in the 1970s (such large increases were an anomaly during the 20th century (March 24, 2000; 65 FR 16052); 3) lynx habitat tends to become more fragmented, drier and of lower quality in secondary area, and thus inherently would support fewer lynx; and 4) the best information regarding the baseline habitat conditions that currently exist in unoccupied areas suggest lynx habitat is in relatively good condition as affected by past timber harvest. Current Plan direction, without the amendment, applied in unoccupied lynx habitat would allow degradation of lynx habitat in some areas. However, in most cases, vegetation management actions conducted by the Forest Service do not result in permanent alterations of habitat. In roadless areas or wilderness, natural conditions would most often prevail. Given the mosaic of mixed aged stands required to sustain lynx populations, and the temporary nature of habitat alterations, lynx habitat in secondary area would remain available for long-term lynx recovery, if it is deemed necessary in the future.

Effects of Plans in areas outside of lynx habitat

The standards and guidelines in the proposed action designed to benefit lynx generally apply only in lynx habitat on Federal lands within LAUs, with exceptions such as recommendations pertaining to connectivity. However, the administrative units within the NRLA area typically

encompass lands that provide lynx habitat and also lands that are not considered lynx habitat. Thus, the Plans being analyzed here affect both lynx habitat and areas without lynx habitat.

Lynx are known to occur outside lynx habitat in anomalous habitats adjacent to as well as far from primary lynx habitat (McKelvey et al. 2000b). We fully expect that lynx will occasionally use habitats outside lynx habitat. Based on our examination of the risk factors to lynx, the analysis in the BA, the information in the LCAS and Science Report, as well as other information in our files, we conclude that the current direction in programmatic Forest Service Plans for lands outside of lynx habitat within LAUs is not likely to adversely affect lynx for the following reasons:

1. In the contiguous United States, the distribution of lynx is associated with southern boreal forests that receive deep snow conditions and support their primary prey, the snowshoe hare (Ruggiero et al. 2000b; 70 FR 68294, November 9, 2005). The proposed amendments focus on maintaining and improving prey populations within lynx habitat. Lynx habitat within the range of the DPS is typically comprised of those vegetation associations that support the highest numbers of snowshoe hares. Habitats outside lynx habitat generally do not have inherent potential to produce snowshoe hares at densities that would support lynx residency and reproduction. Alternate prey species are important to lynx in the southern periphery of their range. However, available evidence suggests that lynx populations are not likely to persist where snowshoe hares do not predominate in the diet (Ruggiero et al. 2000b).
2. Given the best information available, we are able to reasonably define and map lynx habitats, based on—(a) lynx research from Canada and Alaska (Mowat et al. 2000; O’Donoghue et al. 2001), (b) lynx research in Montana, Washington, and Wyoming (Kohler and Britnell 1990; McKelvey et al. 2000c, Squires and Laurion 2000; Squires et al. 2006), (c) relationships between lynx occurrence records and vegetation types in the contiguous United States (McKelvey et al. 2000b), (d) trapping data, (e) knowledge about prey species (Hodges 2000b; Squires et al. 2006), (f) knowledge about prey abundance and lynx population responses (Dolbeer and Clark 1975; McKelvey et al. 2000b, Ruggiero et al. 2000b; O’Donoghue et al. 2001), (g) knowledge regarding lynx response to human activities (Staples 1995; Aubry et al. 2000; Ruggiero et al. 2000b) and (h) local site-specific analyses. Extensive effort has been expended to accumulate and interpret existing knowledge of lynx and their habitats, culminating with publication of the Science Report and LCAS. Lynx occurrence records in the 20th century correspond with our current biological understanding of lynx habitat in the contiguous United States (McKelvey et al. 2000b).
3. We know and expect that lynx will occur outside of lynx habitat types. We conclude, based on but not limited to the research information detailed in (3) above, that these occurrences represent—(a) lynx that are dispersing to lynx habitat elsewhere, (b) lynx that are on relatively short exploratory movements near or adjacent to lynx habitat and will ultimately return to lynx habitat, or (c) individuals that have emigrated from lynx habitat due to prey species declines and ultimately will not successfully establish home ranges and reproduce, and may succumb to starvation for lack of prey.

4. We concur with the direction of the proposed action to focus habitat management efforts in lynx habitat, especially core area, which supports resident populations and contributes to the long-term conservation of lynx.
5. The proposed action also provides direction for additional important non-lynx habitats such as key linkage areas, which likely provide connectivity and opportunistic foraging habitats for lynx. Thus connectivity issues are addressed to the extent Federal land management has jurisdiction or authority.

Species Response to Proposed Action

Lynx populations occur at naturally low densities in the contiguous United States, largely due to inherently low densities of snowshoe hares, their primary prey (Aubrey et al. 2000). Low snowshoe hare densities are likely a result of the naturally fragmented boreal habitat at southern latitudes (including the NRLA area) that prevents hare populations from achieving densities similar to those in the extensive northern boreal forest of Canada.

Rarity of lynx does not necessarily mean that management actions have or will cause population reductions. At the same time, rarity and large home ranges makes it essential to develop and apply broad, landscape-level approaches that ensure the adequate and appropriate analyses of potential management impacts and the development of effective lynx conservation measures.

With the proposed lynx amendments, the Plans will provide this big-picture approach to lynx management. The incorporation of the proposed management direction over the large geographic area in the NRLA area in occupied lynx habitat within 12 of 18 National Forests (12,150,00 acres), contributes to the landscape level direction necessary for the survival and recovery of lynx in the northern Rockies ecosystem. The proposed action would provide for the conservation of lynx and lynx habitat in two of six essential core areas within the range of the United States lynx DPS that were identified for lynx recovery. Further if and when lynx occupy Forests managing unoccupied lynx habitat, the amendment would be applied, which could affect as many as 6,320,000 acres of additional lynx habitat. Until lynx occur on these areas, the proposed action would not affect lynx in these areas. Although lynx habitat may be adversely affect in these areas, the most likely adverse effects from the proposed action would be to vegetation, which would be able to recover and regenerate over time. At the present time, the importance of the lynx habitat within unoccupied areas to lynx recovery is uncertain. The Service's recovery outline emphasizes the importance of core areas in supporting lynx recovery.

Federal land management assumes the largest single role in the conservation of the lynx in the contiguous United States because of the preponderance of lynx habitat types on Federal lands, particularly in the western United States. Because the Forest Service manages a substantial amount of lynx habitat types in the contiguous United States, particularly in the west, it is imperative that lynx habitat and habitat for lynx prey be maintained and conserved on Federal lands.

In the final rule, we concluded that at present time, the contiguous United States lynx DPS does not appear to be threatened by destruction, modification, or curtailment of its habitat or range.

However, under current Plans, a large proportion of Federal land remains subject to management under developmental allocations. Current land management Plans allow management activities that could result in substantial degradation of lynx habitat that could affect productivity, availability, juxtaposition, and connectivity of habitat components at a large scale. This proposed action addresses that risk by creating regulatory mechanisms that will reduce or eliminate those risks in core area within the NRLA area through vegetation and linkage/connectivity standards.

Past analyses (Hickenbottom et al. 1999; U.S. Fish and Wildlife Service 2000) demonstrated that the existing Plans would likely result in adverse effects to lynx, based on 15 different criteria related to the impacts of various Federal land management programs and activities on lynx. The proposed action ameliorates to a great extent the adverse effects of the Plans in lynx core areas by requiring that actions proposed by the Forest Service be designed considering lynx conservation, through application of objectives, standards and guidelines. Further, the proposed action mostly implements the intent and direction in the LCAS, modified with new information and review, which was designed to provide programmatic guidance and to guide project planning to avoid adverse effects to lynx (Ruediger et al. 2000). For all core area within the action area and occupied secondary area, the proposed action includes objectives and standards for appropriate design of or limits on projects that the best information and research indicate have the most serious consequences for lynx: management actions that reduce snow shoe hare numbers through habitat alteration.

Based on our review of the LCAS and new information, the Service concludes that most actions in lynx habitat that are in compliance with the proposed action would either have no effect on lynx or would not likely adversely affect lynx. The most significant exceptions to this include the fuels management and pre-commercial thinning under special circumstances exempted from the standards, which are limited to no more than six percent of occupied habitat. The proposed action also limits the level of adverse effects that are unavoidable with certain other actions, such as recreation developments. Further, we conclude that changes from the standards contained in the LCAS to guidelines does not necessarily increase the likelihood that actions would adversely affect lynx. Guidelines would be implemented in most cases (BA) and adverse effects would not always occur where guidelines were not implemented. Effects would be based on site-specific conditions. Thus, we do not expect that adverse effects, as a result of changing LCAS standards to guidelines for this amendment, would reach levels that impact lynx populations. The Forest Service changed standards to guidelines mostly based on our finding that the actions did not pose threats to the DPS, and upon review of past and new research information. Our positions were based on the lack of conclusive or reliable information that supported that such actions or activities were exerting negative impacts on the DPS. Thus, changes from standards in the LCAS to guidelines in the amendment occurred when the best available information indicated that the action was not likely to adversely affect lynx, or not likely to adversely affect lynx in most cases (i.e. where no conclusive or reliable information supported the standard in the LCAS). Application of the proposed standards and for the most part, guidelines, in core and occupied secondary area would substantively reduce the potential for adverse effects on lynx over the existing Plans.

Lynx may occur in currently unoccupied secondary area at some point in the future. The importance of secondary area to lynx recovery is not yet known. However, it is reasonable at this point in our understanding of lynx ecology to expect that lynx may occupy portions of secondary area in the future, either for dispersal movements or perhaps to establish home ranges, if and when lynx populations in core area expand. The quantity and quality of lynx habitat within unoccupied secondary area varies considerably across the NRLA area, but is generally drier and more fragmented than lynx habitat in core areas. Much of the unoccupied secondary and peripheral area occurs in mountain ranges disjunct from larger blocks of core area. Therefore we expect that lynx would occupy these areas only at very low densities, or only intermittently through time, if at all. It is difficult to predict if, when or where lynx would most likely occur within these areas. Lynx that attempt to establish home ranges may be adversely affected by Forest management actions, as none of the objectives, standards or guidelines would apply if lynx go undetected. The proposed action includes no requirement or direction for surveying currently unoccupied lynx habitat. Lynx that disperse through secondary habitat are not as likely to be adversely affected by Forest actions, as existing Plan direction likely provides connectivity and opportunistic foraging habitats for lynx that provide for dispersal. The best information related to dispersal movements and recent evidence of dispersal of lynx from Colorado to Wyoming, Montana and Idaho support this premise. In any case, relatively low numbers of individuals would be adversely affected in the next decade. We base this conclusion on: 1) the naturally low density of lynx in the NRLA area, even in the best habitat (core areas); 2) in recent decades, the lack of an observed increase or expansion of lynx, such as that which occurred in the early 1960s and again in the 1970s (such large increases were an anomaly during the 20th century (March 24, 2000; 65 FR 16052); and 3) lynx habitat tends to become more fragmented, drier and of lower quality in secondary area, and thus inherently would support fewer lynx. Current Plan direction, without the amendment, applied in unoccupied lynx habitat would allow degradation of lynx habitat in some areas. However, in most cases, vegetation management actions conducted by the Forest Service do not result in permanent alterations of habitat. In roadless areas or wilderness, natural conditions would most often prevail. Glacier and Yellowstone National Parks occur within or adjacent to the NRLA area and also provide contiguous expanses of lynx habitat where natural condition are expected to predominate. Given the mosaic of mixed aged stands required to sustain lynx populations, and the temporary nature of habitat alterations, lynx habitat in secondary area would remain available for long-term lynx recovery, if it is deemed necessary in the future.

We conclude, based on our entire analysis, that the proposed action would support lynx populations in core areas, and would not appreciably reduce the reproduction, numbers or distribution of lynx in the NRLA. The recovery outline for lynx (U.S. Fish and Wildlife Service 2005) presents our current understanding of historical and current lynx distribution, ecology, population dynamics, and the relative importance of different areas to the persistence of lynx in the contiguous United States. We have determined that the proposed action is compatible with our understanding of recovery needs for lynx in the contiguous United States DPS. As analyzed in this opinion, the proposed action addresses, in whole or in part, each of the objectives in the recovery outline for lynx.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

In the NRLA action area, seven percent of the area occurs on private, State or tribal lands, encompassing over three million acres (Table 17, BA). Portions of private lands, especially those above 4000 feet in elevation, are likely in potential lynx habitat. Due to the forested nature of lynx habitat, large portions of this habitat occur on private, State, and corporate timber lands where timber harvest and thinning occurs. The tribes, States and several corporate timber companies own property in the NRLA area.

The Confederated Salish and Kootenai Tribes (CSKT) manage the Flathead Indian Reservation in Montana. Their Forest Management Plan incorporates the provisions of the LCAS (Confederated Salish and Kootenai Tribes 2000). The CSKT manage lynx habitat in the Mission Mountains, where the plan will continue to reduce the potential for land management actions to adversely affect lynx or lynx habitat. The Montana Department of Natural Resources and Conservation (MTDNRC) has had a lynx habitat management plan in place since 1998, prior to lynx being listed. In 2003, the department developed a mapping protocol for State lands and adopted administrative rules to conserve lynx.

Plum Creek Timber company is a major land owner in the NRLA area, with over 450,000 acres of lynx habitat. The company participates in the Sustainable Forest Initiative (SFI) program, which is a comprehensive system of principles, objectives and performance measures developed by foresters, conservationists and scientists, which combines the growth and harvest of trees and protection of wildlife, plants, soils and water quality (American Forest and Paper Association 2006). Plum Creek lands in western Montana are also managed under its Native Fish Habitat Conservation Plan. Both of these programs moderate to an extent, the potential adverse impacts of forestry practices on lynx.

Other smaller parcels of private lands will be primarily used for residential areas, or may be used for small scale forestry, or will developed for business uses in the future. Also, corporate timber lands are being divided into smaller parcels and offered for sale to private landowners. For example, in the Seeley Lake/Swan Valley area of northwest Montana, Plum Creek Timber Company is selling some corporate timber land for (primarily) residential development. Some corporate timber land is being acquired by conservation organizations or State agencies (Jim Williams, Montana Fish, Wildlife and Parks pers. comm. 2006). Plum Creek is a partner in a conservation agreement for grizzly bears in the Swan River Valley of Montana, along with the Flathead National Forest, MTDNRC and the Service, and is proposing to sell important sections of their holdings to conservation buyers or the Forest Service.

In addition to timber management, activities on non-Federal lands may include mineral extraction, oil and gas exploration, urban and rural development, recreation site construction and use, road construction, and utility corridors. Habitat loss or degradation and direct mortality of

lynx are possible adverse impacts on lynx. Cumulatively, urbanization and highway development may impact connectivity in lynx habitat. To date, lynx are known to have dispersed long distances, from Canada to northwest Montana and from Colorado to northwest Montana (T. Shenk, pers. comm. 2007). Past highway development has evidently not created a total barrier to lynx movements and highway projects would be reviewed under section 7(a)2 of the Endangered Species Act. However, ensuing private land development is likely to continue.

While not an action that will result in cumulative effects, the Service acknowledges that the MTDNRC is in process of completing a Habitat Conservation Plan (HCP) with the Service; MTDNRC entered into an agreement with the Service committing to developing an HCP using Congressional appropriated funding. Although not yet final, the plan has undergone technical and public review, scoping for an Environmental Impact Statement (EIS) is complete and the EIS is in preparation (April 28, 2003, 81 FR 22412). We therefore consider the completion of the HCP as a reasonably foreseeable action that will reduce the potential for negative effects to lynx from State forestry practices. The HCP will also go through review under section 7(a)2 of the Endangered Species Act.

There is potential and a reasonable likelihood for future management of many private lands within the NRLA area to have negative impacts on lynx habitat. Some snowshoe hare habitat would likely be permanently lost to development, and some would be reduced in quality through thinning or timber harvest. Not all lands would be developed or used in ways that have negative impacts on lynx habitat. Combined, private lands developed or used in ways that would have negative impacts on lynx habitat would constitute a fairly small proportion of lynx habitat within the NRLA area. With the exception of State or corporate timber lands, private land parcels are fairly small in size relative to the large landscape required by an individual lynx to support its home range and are scattered throughout the NRLA area. Many are and would be adjacent to or interspersed with Forest Service or other Federal land, and therefore some of the potential negative effects on the private parcels would be moderated by federal land management.

The final rule did not find that present conditions on private lands threaten the DPS. Within the action area, 93 percent of lynx habitat would be managed by the Forest Service or other federal agencies into the future. As stated previously, the Forest Service manages the preponderance of lynx habitat within the NRLA area. Within the core areas in the NRLA area, the proposed action substantively reduces the primary threat to lynx (inadequate regulatory mechanisms) by addressing the major adverse impacts of Federal land management on lynx, as well as several other potential impacts or influences that do not rise to the level of a threat to lynx. Further, the proposed action would alleviate some of the adverse actions on private land, where lands are adjacent to Forest lands or within the same LAU. The Forest Service considers the condition of lynx habitat on private lands within LAUs, to the extent possible, in its assessment of baseline conditions during the development of projects for Forest lands, and adjusts its action to reduce negative effects in the LAU.

CONCLUSION

After reviewing the current status of Canada lynx, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of lynx within the contiguous United States DPS. No critical habitat has been designated for this species on Federal lands within the NRLA area, therefore none will be affected.

The proposed action incorporated much of the information in the LCAS and Science Report, part of the best commercial and scientific information available with which to analyze the effects of Federal land management on lynx. The LCAS incorporated a comprehensive amount of information available in 2000, including information contained in the Science Report and other information on lynx and forest management activities. The LCAS is currently being updated and clarified with new information, information from recent publications, investigations in progress, and improved knowledge of the distribution of lynx (J. Claar, pers. comm. 2006). However new information supports that primary conservation measures that conserve horizontal structure and vegetation mosaics are essential components of lynx habitat. We conclude that the programmatic and project-level objectives, standards, and guidelines in proposed action provide comprehensive conservation direction adequate to reduce adverse effects to lynx from Forest management and to preclude jeopardy to the lynx DPS.

As stated in the final rule, we believe Plan amendments for those administrative units with lynx habitat are necessary for long-term conservation of habitat for lynx and its prey on Federal lands. Without programmatic guidance and planning to conserve lynx, assessment of land management effects to lynx and development of appropriate conservation strategies are left to project-specific analyses without consideration for larger landscape patterns.

The Service concludes that continued implementation of the Plans incorporating the amendments for lynx conservation may result in some level of adverse effects to lynx. However, the level of adverse effects to lynx are not reasonably expected to, directly or indirectly, reduce appreciably the likelihood of both the survival and recovery of the lynx DPS in the wild by reducing the reproduction, numbers, or distribution of lynx. Factors important in our assessment of jeopardy include, but are not limited to the following:

- Considering the environmental baseline for lynx, the final rule indicated that although several factors may be impacting lynx at smaller scales, only one factor was currently threatening the lynx DPS--inadequate Plans that reflect inadequate regulatory mechanisms. The proposed action addresses that threat through Forest management adequate to ensure long-term persistence of lynx in two of the six areas within the range of the United States lynx DPS determined to be lynx "core" area (Service 2005).
- The proposed amendments considered information in the Science Report, LCAS, final listing rule, remanded determination of listing, recent research information, and the recovery outline for lynx. These documents outline the best available information concerning threats to lynx and means to address the threats.

- The recovery outline for lynx (U.S. Fish and Wildlife Service 2005) presents our current understanding of historical and current lynx distribution, ecology, population dynamics, and the relative importance of different areas to the persistence of lynx in the contiguous United States. We have determined that the proposed action is compatible with our understanding of recovery needs for lynx. As analyzed in this opinion, the proposed action addresses, in whole or in part, each of the objectives in the recovery outline for lynx.
- The proposed action would immediately apply lynx management direction on nearly 12.2 million acres of occupied lynx habitat, including all lynx habitat in the two core areas in the action area, that were delineated in the recovery outline. The proposed action would apply direction that would substantially reduce or eliminate adverse effects to lynx from Forest Service land management activities on at least 94 percent of this area, and more likely nearer to 98 percent. This lynx management direction would apply to also to occupied lynx habitat in secondary areas as well.
- The best information indicates that existing Forest Plan direction would provide connectivity and opportunistic foraging habitats for dispersing lynx, and may provide for lynx home ranges at low densities, in unoccupied lynx habitat within secondary areas. The proposed action would amend the Forest Plans on approximately 3.3 million acres of unoccupied lynx habitat in secondary areas, and 1.1 million acres of unoccupied peripheral area, but would not require implementation of the amendment until evidence indicates that lynx occupy a Forest. If and when occupancy is established, the amendment would apply throughout the life of the proposed action. In the meantime, existing Forest Plan direction would apply, but the measures in the amendment could be considered in planning actions.
- Forest management actions conducted under existing Plan direction may negatively affect lynx habitat in secondary area in currently unoccupied Forests. However, the nature of most vegetation management alteration is temporary and reversible (i.e. forests regrow, or can be restored), and other types of Forest Service actions are unlikely to have severe or permanent impacts during the life of the proposed amendment. Thus, if additional information suggests or a final recovery plan determines that lynx habitat in secondary (or peripheral) areas is needed to sustain additional occupancy by lynx in the future, and as such warrants more protection, currently unoccupied lynx habitat in secondary areas on National Forest lands would be available for lynx recovery purposes over the long term.
- The lynx recovery outline is clear in its emphasis of concentrating lynx conservation measures in core area.
- One factor considered in this effects analysis was the uncertainty regarding the level and type of effects that land use management decisions at both project and programmatic levels may have on the contiguous United States lynx DPS. Researchers suggest that management plans should thus be conservative regarding retention of known important

lynx habitat components (McKelvey et al. 2000a). The proposed amendment meets this direction by addressing Forest land management actions that have the most potential to adversely affect key lynx habitat components. The Service considers the retention of high quality snowshoe hare habitat in core area as most essential to lynx conservation. The vegetation standards would be applied across at least 94 percent of lynx habitat in core area, and in any secondary area occupied by lynx. These standards directly address the major impacts identified in research: harvesting forests and creating early stand initiation stages, precommercial thinning, and altering multistoried stands. Managing and moderating the impacts of these actions will maximize snowshoe hare production, thus benefiting lynx populations.

- The Forest Service has demonstrated a commitment toward partnerships for the conservation of lynx and lynx habitat on a programmatic level. In March 1998, the Forest Service, BLM, and NPS began a collaborative process with the Service to collect and analyze existing information on lynx (the Science Report) and assess the conservation needs of lynx and develop a lynx conservation strategy (LCAS) applicable to Federal land management. From 1999 through 2002 the Forest Service conducted extensive surveys to detect lynx presence on Forests across the range of lynx DPS, and are surveying the remaining Forest this year (J. Claar, pers. comm. 2006). In 2006, the agencies have initiated an update and clarification of the LCAS in order to incorporate new science and other information regarding the impacts of forest management on lynx.
- A large proportion of lynx habitat on Forest Service lands in the NRLA area (67 percent) occurs in lands with nondevelopmental status where management focuses on the maintenance of natural ecological processes, or conservation of rare ecological settings or components. In unoccupied lynx habitat in secondary areas, about 70 percent is in nondevelopmental status.
- Negative effects on lynx may not be totally eliminated, but are significantly reduced by the proposed management direction compared to the direction in existing Forest Plans. In at least 94 percent of core area and occupied secondary areas, vegetation management projects on Forest Service lands would be designed under the management direction and guidance of the proposed action to the point that they are likely to avoid adverse effects on lynx. Further, in the remaining six percent of this areas, many fuels management projects can be designed in compliance or in partial compliance with the proposed standards and guidelines. Other projects types that are likely to adversely affect lynx, such as recreation development, are constrained by standards mandating maintenance of connectivity (the major adverse impact) and affect a relatively small proportion of lynx habitat within the NRLA area.
- The adverse effects of the action to lynx in core area due to the exemptions for fuels management and pre-commercial thinning constitute a small portion of the range of the species (less than six percent) and are offset by the beneficial effects of the proposed action in the balance of the core area and occupied secondary areas. Monitoring and recording of fuels treatment actions are required as decisions are signed to ensure that the

number of acres treated through exceptions stated in the vegetation management standards does not exceed six percent of lynx habitat.

- The proposed action is consistent with section 7(a)(1) of the Act through Forest Service commitments to undertake proactive management actions to benefit lynx.

INCIDENTAL TAKE

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of an incidental take statement.

In general, an incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize the impacts of the take and sets forth terms and conditions which must be complied with in order to implement the reasonable and prudent measures.

Amount or Extent of Take Anticipated

Forest Plans are permissive, in that they allow, but do not authorize actions to occur. This biological opinion identifies management direction that allows for activities that adversely affect lynx. The proposed action reduces the potential for incidental take to occur as a result of actions implemented under the current Plans. However, at the broad scale of this consultation (18 National Forests), the Service is unable to anticipate all possible circumstances that may possibly involve the take of lynx that may be caused by the proposed action, with the exception of fuels and timber management (see below). The Service therefore conservatively anticipates that some low level of incidental take may occur in core and occupied secondary areas from activities other than fuels and timber management. The Service believes that the level of take would be low because the proposed action considers the known habitat and environmental factors influencing lynx, and includes standards and guidelines that avoid or minimize adverse effects, as detailed in this biological opinion. We also anticipate that there is a small risk that Forest management actions may result in take of lynx that could occupy what is currently unoccupied habitat, sometime in the future during the life of the proposed action. In unoccupied secondary areas, lynx may establish home ranges but the proposed measures to reduce or eliminate the potential for adverse effects would not be implemented unless lynx were detected, and there is no provision in the proposed amendment to survey for lynx in lynx habitat in currently unoccupied

secondary area. However, it is not possible at this time to estimate incidental take of lynx likely to occur from the proposed management direction, since site specific information related to the number, type, timing, location, and other such details of projects conducted under the amendment is unknown. Consequently, all consideration of incidental take and any reasonable and prudent measures required to minimize its effect on the species addressed in this consultation is deferred to further consultation on individual projects. Take that may occur due to trapping or shooting by private citizens within the action area is not exempted in this opinion.

The exception to this deferral is take from fuel and timber management projects in core and occupied secondary areas. We anticipate that that most of the take associated with implementation of the proposed action would occur in core area and occupied secondary areas when projects are conducted under the exceptions to the vegetation standards VEG S1, S2, S5 and S6. We anticipate this take in the form of harm, as the exceptions allow modification of lynx habitat that would result in decreased production and density of snow shoe hares, their primary prey. The Service anticipates such incidental take of lynx will be difficult to detect for the following reasons:

- Lynx are wide-ranging, not easily detected in the wild.
- Although we have a general understanding of where lynx population centers are within the action area, the distribution of individual lynx across the NRLA area or at smaller scales within the area is not known.
- Although we have a general understanding that snowshoe hares occur and are widely distributed in lynx habitat across the action area, snowshoe hare densities across the NRLA area or at smaller scales within the area are not known.
- We lack information to accurately predict the number of snowshoe hares and alternate prey needed for the survival of adult lynx or kittens.
- Snowshoe hare populations exhibit population cycles in Canada and although not well understood, populations likely fluctuate in the United States as well. This variation could cloud our ability to demonstrate a direct cause and effect relationship. It may be difficult in many cases to determine whether mortality or injury of lynx is attributable to incidental take of lynx as a result of the proposed action, or whether it was natural mortality or injury of lynx due to natural declines in snowshoe hares.
- We lack information to predict with precision the densities of hares in various habitat and forest stands, before and after specific treatments, especially in relationship to the host of naturally occurring environmental variables that may affect hare densities.
- Discovery or detection of lynx injury or mortality attributed to habitat alteration is very unlikely.

All of these variables are difficult to monitor or census. According to Service policy, as stated in the Endangered Species Consultation Handbook (March 1998) (Handbook), some detectable measure of effect should be provided, such as the relative occurrence of the species or a surrogate species in the local community, or amount of habitat used by the species, to serve as a measure for take. Take also may be expressed as a change in habitat characteristics affecting the species, such as water quality or flow (Handbook, p 4-47 to 4-48). Because of the difficulty of estimating the precise number of lynx that would experience take in the manner described above,

we have developed a surrogate measure to estimate the amount of anticipated take. The surrogate measure for the number of lynx harmed will be quantified using acres of occupied lynx habitat.

Because the Forest Service has provided explicit estimates on the number of acres that will be impacted by the proposed fire and timber management within occupied lynx habitat, we are able to accurately assess take from these activities. We have determined that many of the projects conducted under the exemptions from or exceptions to vegetation standards VEG S1, S2, S5 and S6 would result in take in the form of harm. Therefore, we are using the number of acres treated under these exceptions under the proposed action as a detectable surrogate for the number of lynx taken in the form of harm. This approach is consistent with Service policy, as stated in the Endangered Species Consultation Handbook, that some detectable measure of effect should be provided, such as the relative occurrence of the species or a surrogate species in the local community, or amount of habitat used by the species, to serve as a measure for take.

This biological opinion anticipates the following amounts of take in the form of harm (modification of habitat that reduce the snowshoe hare prey base for lynx): treatment of up six percent of occupied lynx habitat over ten years -- 729,000 acres (12,150,000 x 6 percent) due to fuels management, and no more than 64,320 acres of snowshoe hare foraging habitat due to pre-commercial thinning for vegetation management for other resource benefits (Appendix D, Table 1). Because the exemptions and exceptions are limited to a total of no more than about six percent of all lynx habitat, the decrease in prey base would translate to some low level of impairment of reproduction and feeding, during some years. Specifically, we anticipate that some adult female lynx within home ranges affected by such projects may fail to complete a pregnancy or would be less successful in finding adequate food resources needed to ensure maximum survival potential for kittens. Thus, we expect reproductive impairment and kitten survival to be impacted.

Effect of Take

To give perspective on what these losses mean to lynx, the average lynx territory in the NRLA area is 53,375 acres for males and 21,745 acres for females (Squires et al. 2004). While the proposed action limits adverse fuel treatments allowed in the WUI to total no more than six percent of lynx habitat per Forest, it does not prohibit fuels treatments that are exempt from VEG S1 to occur in adjacent or multiple LAUs. However, the impacts from fuels treatments and precommercial thinning would be distributed across the Forests encompassing 12,150,000 acres of occupied lynx habitat in the NRLA occupied area and occur within WUIs (Table 1, Appendix D and Appendix E), therefore the number of individual lynx home ranges that would be affected would be low. Further, the Forest Service estimates that based on past and anticipated funding levels, the acres of lynx habitat treated would in fact most likely be much less than six percent, more on the order of about 1.4 percent (Appendix C and D, Table 1). Also, even in areas treated through exemptions and exceptions and resulting in adverse effects, the level of reduction in snowshoe hare prey base will vary depending upon site conditions, and thus would not always result in take of lynx.

The take of lynx in the future in currently unoccupied secondary habitat would be low and of less impact to recovery than take of lynx in core area because a) lynx habitat in secondary areas is often of inherently lower quality, either drier or more naturally fragmented, or smaller in area than in core area and/or relatively isolated from other blocks of lynx habitat and thus supports corresponding lower densities of lynx, if any, in secondary area; and/or b) the expected numbers and densities of lynx in these secondary areas would be low for many years if lynx establish, thus intra-specific competition for available resources would also be low for many years.

In the accompanying biological opinion, the Service has determined that this level of anticipated take is not likely to result in jeopardy to the species.

Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of lynx:

RPM #1: The Forest Service shall minimize harm of lynx from fuels management by ensuring that the acres impacted are not concentrated in a geographic area or several adjacent LAUs .

RPM #2: The Forest Service shall minimize harm of lynx from pre-commercial thinning and other vegetation management projects by ensuring that lynx home ranges, as represented by LAUs, either retain sufficient foraging habitat (when sufficient foraging habitat already exists in an LAU) or does not substantially reduce foraging habitat (when sufficient foraging habitat does not already exist in an LAU).

RPM #3: On those Forests with currently unoccupied lynx habitat, lynx detection is needed to assess whether further management direction is warranted (including application of the amendment) to minimize or avoid adverse affects to lynx. The Forest Service shall minimize harm to lynx attempting to establish or maintain home ranges in currently unoccupied secondary habitat at some point in the future, during the life of the proposed action.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the Act, the Forest Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline reporting and monitoring requirements. These terms and conditions are non-discretionary.

The following terms and conditions implement reasonable and prudent measure #1:

The Forest Service shall ensure that fuels management projects conducted under the exemptions from standards VEG S1, S2, S5 and S6 in occupied habitat:

1. Do not occur in greater than six percent of lynx habitat on any Forest.
2. Do not result in more than 3 adjacent LAUs not meeting the VEG S1 standard of no more than 30 percent of an LAU be in stand initiation structural stage.

The following term and conditions implement reasonable and prudent measure #2:

3. In occupied lynx habitat, precommercial thinning and vegetation management projects allowed per the exceptions listed under VEG S5 and S6, shall not occur in any LAU exceeding VEG S1, except for protection of structures.

The following term and condition implements reasonable and prudent measure #3:

4. The Forest Service shall work with the Service to develop and complete an acceptable protocol to survey currently unoccupied lynx habitat in secondary area within 18 months of the date of Forest Service's Record of Decision for the amendments. An acceptable protocol may include any or none of the following, and is not limited to the following: surveying each Forest with unoccupied lynx habitat at some regular interval; ground-truthing and refining lynx habitat maps to more accurately identify lynx habitat in secondary area; relying on survey data generated by other cooperating agencies; removing some portions of secondary area from survey requirements (based on for instance, the best mapping information, most recent information, habitat quality and quantity, advice and recommendations from lynx experts, and juxtaposition between core areas). The Forest Service shall provide a written rationale for the protocol.

Monitoring and Reporting Requirement

The Forest Service Northern Region (Region 1) Office in Missoula, shall provide a written annual report to the Service each year this biological opinion is in effect. The report will include a summary of the reporting requirements listed below. The report shall be submitted to the Service by April 1 of each year, or other date through mutual agreement.

The report shall document the following information related to fuel treatment and vegetation management projects occurring in occupied lynx habitat:

- 1) To ensure that term and condition 1 has not been exceeded in any administrative unit, report the acres per Forest and LAU, of lynx habitat treated through fuel treatment projects, within and outside the WUI (as defined by HFRA). Report whether or not fuel treatment project met the vegetation standards and guidelines. If standards or guidelines were not met, report which were not met and include which exemptions were used, how many acres were affected, and why the standards could not be met.
- 2) To ensure that term and condition 2 is met, report any two, adjacent LAUs that have more than 30 percent of lynx habitat in stand initiation structural stages, either because of natural events, vegetation management or fuel treatment projects, or any combination of these or other causes.
- 3) To ensure that term and condition 3 is met, report the acres per Forest and LAU, of lynx habitat treated through precommercial thinning or other vegetation management projects as allowed in VEG S5 and S6; record the type of activity, acres, location and whether or not standard VEG S1 was within the allowance.

- 4) Monitoring requirements **shall be reported by Forests at the time the project decision is signed**. The report shall be sent to the designated Forest Service office with responsibility for maintaining an accurate accounting of reports. This requirement ensures that projects do not treat more than six percent of lynx habitat under exceptions to the vegetation standards, as described in the proposed action and term and condition 1. of this incidental take statement. This reporting requirement is found, in part, in the proposed action and is also a requirement of this biological opinion.

The following monitoring requirement is partially required by the proposed action, and would allow us to gauge the validity of our assumptions and those in the BA that suggest guidelines would be implemented in most cases:

- 5) In occupied lynx habitat, the Forest Service shall document, in the annual report, the rationale for deviations from guidelines established in the proposed action. The draft Environmental Impact Statement defines a “guideline” as follows: A guideline is a particular management action that should be used to meet an objective found in a land management plan. The rationale for deviations *may be* documented [emphasis added], but amending the plan is not required. Application of specific guidelines in some cases may further minimize the impact of or potential for take. This monitoring requirement requires the Forest Service to document the rationale in all cases.

The annual report should be submitted to Service Field Offices responsible for tracking the requirements of the proposed action and the monitoring requirements. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. The anticipated level of incidental take exempted in this incidental take statement is quantified through the use of the surrogate measures of up to 729,000 acres treated through exemptions to vegetation standards for fuels management, and no more than 62,260 acres of lynx habitat treated through exceptions to VEG S5 for precommercial thinning projects. If, during the course of this action, these limits on acres treated are exceeded on any Forest, the Service will determine if the level of anticipated incidental take has been exceeded. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal Agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery programs, or to develop information.

1. The Forest Service should ensure to the extent possible, that unoccupied habitat continues to facilitate and allow dispersal of lynx into the future. Therefore in linkage zones in unoccupied lynx habitat or for projects that may affect such linkage zones, apply the following direction from the proposed action:

- Maintain or restore lynx habitat connectivity in linkage areas (**All O1**).
- New or expanded permanent developments and vegetation management projects must maintain habitat connectivity in linkage areas (**All S1**).
- Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways or forest highways across federal lands (**All G1**).
- In areas of intermingled land ownership, work with landowners to pursue conservation easements, habitat conservation plans, land exchanges, or other solutions to reduce the potential of adverse impacts on lynx and lynx habitat (**LINK O1**).
- When highway or forest highway construction or reconstruction is proposed in linkage areas, identify potential highway crossings (**LINK S1**).
- National Forest Service lands should be retained in public ownership (**LINK G1**).

2. The Forest Service should coordinate with the Service to develop, within 18 months, a method to monitor the amount and condition of lynx habitat in unoccupied secondary habitat, as recommended in the lynx recovery outline. This information would be useful in future assessments of the value of secondary area to lynx.

3. The Service commends the Forest Service for initiating important efforts to increase our understanding of lynx and lynx habitat with completion of the Science Report, lynx habitat mapping, and linkage zone identification, and assuming leadership roles on both the Lynx Biology Team and Lynx Steering Committee. We recommend that you continue to be a leader in these arenas, and to the extent possible, alone and/or in coordination/cooperation with other federal, State, or private entities, work to fulfill the following key items identified in the lynx recovery outline to gain additional information could be useful in managing lynx.: 5.5.2, 5.5.4, 5.5.5, 6.6.1, 6.6.2, 6.6.3, 6.6.5

REINITIATION REQUIREMENT

This concludes formal consultation on the proposed action outlined in your request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We appreciate your continued cooperation in meeting our joint responsibilities under the Endangered Species Act. If you have questions or comments regarding this biological opinion, please Anne Vandehey of my staff at (406) 449-5225 extension 212.

Sincerely,

R. Mark Wilson
Field Supervisor

LITERATURE CITED

- Adams, A.W. 1963. The lynx explosion. *North Dakota Outdoors* 26:20-24.
- Adams, L. 1959. An analysis of a population of snowshoe hares in northwestern Montana. *Ecological Monographs* 29:141-170.
- Agee, J.K. 2000. Disturbance ecology of North American boreal forests and associated northern/mixed subalpine forests. Chapter 3. In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado, Boulder.
- American Forest and Paper Association 2006. Website.
http://www.afandpa.org/Content/NavigationMenu/Environment_and_Recycling/SFI/SFI.htm
- Apps, C.D. 2000. Space-use, diet, demographics, and topographic associations of lynx in the southern Canadian Rocky Mountains: a study. Chapter 12. In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado, Boulder.
- Aubry, K.B., G. Koehler, and J.R. Squires. 2000. Ecology of Canada lynx in southern boreal forests. Chapter 13. In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado, Boulder.
- Ausband, D.E. and G.R. Baty. 2005. Effects of precommercial thinning on snowshoe hare habitat use during winter in low-elevation montane forests. *Canadian Journal of Forest Research* 35:206-210.
- Bailey, T.N. 1974. Social organization in a bobcat population. *Journal of Wildlife Management* 38:435-556.
- Bailey, T.N., E.E. Bangs, M.F. Portner, J.C. Malloy, and R.J. McAvinchey. 1986. An apparent over exploited lynx population on the Kenai Peninsula, Alaska. *Journal of Wildlife Management* 50:279-290.
- Berrie, P.M. 1974. Ecology and status of the lynx in interior Alaska. Pages 4-41 in R.L. Eaton, editor. *The world's cats*. Volume 1. World Wildlife Safari, Winston, Oregon.
- Bittner, S.L., and O.J. Rongstad. 1982. Snowshoe hare and allies. In J.A. Chapman, and G.A. Feldhamer, editors. *Wild mammals of North America biology, management and economics*. Johns Hopkins University Press, Baltimore, Maryland.
- Brainerd, S.M. 1985. Reproductive ecology of bobcats and lynx in western Montana. M.S. Thesis, University of Montana, Missoula.

- Brand, C.J., and L.B. Keith. 1979. Lynx demography during a snowshoe hare decline in Alberta. *Journal of Wildlife Management* 43:827-849.
- Brand, C.J., L.B. Keith, and C.A. Fischer. 1976. Lynx responses to changing snowshoe hare densities in central Alberta. *Journal of Wildlife Management* 40:416-428.
- Brocke, R.H. 1982. Restoration of the lynx (*Lynx canadensis*) in Adirondack Park: a problem analysis and recommendations. Federal Aid Project E-1-3 and W-105-R, Study XII, Job 5, Final Report. New York Department of Environmental Conservation.
- Brocke, R.H., K.A. Gustafson, A.R. Major. 1990. Restoration of lynx in New York: biopolitical lessons. *Trans. N.A. Wildl. and Nat. Res. Conf.* 55:590-598.
- Buehler, D.A., and L.B. Keith. 1982. Snowshoe hare distribution and habitat use in Wisconsin. *Canadian Field Naturalist* 96:19-29.
- Bunnell, K.D., J.T. Flinders, and M.L. Wolfe. 2006. Potential impacts of coyotes and snowmobiles on lynx conservation in the Intermountain West. *Wildlife Society Bulletin* 34(3):828-838.
- Bureau of Land Management and U.S. Fish and Wildlife Service. 2000. Lynx conservation agreement between the U.S. Fish and Wildlife Service and the Bureau of Land Management. U. S. Fish and Wildlife Service, Denver, Colorado.
- Burt, W.H. 1954. The mammals of Michigan. University of Michigan Press, Ann Arbor, Michigan.
- Buskirk, S.W., L.F. Ruggiero, C.J. Krebs. 2000a. Habitat fragmentation and interspecific competition: implications for lynx conservation. Chapter 4. In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado, Boulder.
- Carbyn, L.N., and D. Patriquin. 1983. Observations on home range sizes, movement, and social organization of lynx (*Lynx canadensis*) in Riding Mountain National Park, Manitoba. *Canadian Field Naturalist* 97:262-267.
- Confederated Salish and Kootenai Tribes. 2000. Flathead Indian Reservation forest management plan. Unpublished report, Confederated Salish and Kootenai Tribes, Pablo, Montana.
- DeStefano, S. 1987. The lynx. *Audubon Wildlife Report*: 411-422. National Audubon Society Publication.
- Dolbeer, R.A., and W.R. Clark. 1975. Population ecology of snowshoe hares in the central Rocky Mountains. *Journal of Wildlife Management* 39:535-549.

- Eisenberg, J.F. 1986. Life history strategy of the Felidae: variations on a common theme. Pages 293-303 in S.D. Miller and D.D. Everett. Cats of the world: biology, conservation, and management. National Wildlife Federation, Washington, D.C.
- Findley, J.S., and S. Anderson. 1956. Zoogeography of the montane mammals of Colorado. *Journal of Mammalogy* 37:80-82.
- Fox, J.F. 1978. Forest fires and the snowshoe hare-Canada lynx cycle. *Oecologia* 31:349-374.
- Gibeau, M., and K. Heuer. 1996. Effects of transportation corridors on large carnivores in the Bow River Valley, Alberta. Pages 67-79 in Proceedings of the Florida Department of Transportation/Federal Highway Administration Transportation-Related Wildlife Mortality Seminar. Orlando, Florida.
- Griffin, P.C. 2004. Landscape ecology of snowshoe hares in Montana. PhD dissertation, University of Montana, Missoula.
- Gunderson, H.L. 1978. A mid-continent irruption of Canada lynx, 1962-1963. *Prairie Naturalist* 10:71-80.
- Halfpenny, J.C., S.J. Bissell, and D.M. Nead. 1982. Status of the lynx (*Felis lynx*; *Felidae*) in Colorado with comments on its distribution in the western United States. Unpublished manuscript, Institute of Arctic and Alpine Research, Boulder, Colorado.
- Hall, E.R., and K.R. Kelson. 1959. The mammals of North America. Volume II. Ronald Press, New York.
- Harger, E.M. 1965. The status of the Canada lynx in Michigan. *Jack-pine Warbler* 43:150-153.
- Hickenbottom, J. R., B. Summerfield, J. Aardahl, G. Halekas, M. Hilliard, L. Jackson, D. Prevedel, J. Rupe. 1999. Biological assessment of the effects of National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans on Canada lynx. U.S. Forest Service, Ogden Utah. 149 pp.
- Hillis, M., A. Jacobs and V. Wright. 2003. U. S. Forest Service region one Canada lynx assessment. Prepared by the National Fire Plan Cohesive Strategy Team. U.S. Forest Service, Northern Region. Missoula, Montana. 29 p.
- Hodges, K.E. 2000a. The ecology of snowshoe hares in northern boreal forests. Chapter 6. In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.
- Hodges, K.E. 2000b. Ecology of snowshoe hares in southern boreal and montane forests. Chapter 7. In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.

- Homyack, J.A. 2003. Effects of precommercial thinning on snowshoe hares, small mammals, and forest structure in northern Maine. M.S. Thesis, University of Maine.
- Kesterson, M.B. 1988. Lynx home range and spatial organization in relation to population density and prey abundance. M.S. Thesis, University of Alaska, Fairbanks.
- Koehler, G.M. 1990. Population and habitat characteristics of lynx and snowshoe hares in north-central Washington. *Canadian Journal of Zoology* 68:845-851.
- Koehler, G.M., and K.B. Aubry. 1994. Chapter 4: Lynx. Pages 74-98 in American Marten, Fisher, Lynx, and Wolverine in the Western United States, L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, L.J. Lyon, W.J. Zielinski, editors. U.S. Forest Service, General Technical Report RM-251.
- Koehler, G.M., and J.D. Brittell. 1990. Managing spruce-fir habitat for lynx and snowshoe hares. *Journal of Forestry* 88:10-14.
- Koehler, G.M., J.D. Brittell, and H.S. Hash. 1979. Lynx movements and habitat use in Montana. *Canadian Field Naturalist* 93:441-442.
- Kolbe, J.A. 2005. The effect of snowmobile trails on coyote movements within lynx home ranges. M.S. Thesis, University of Montana, Missoula.
- Kolbe, J.A., J.R. Squires, D.H. Pletscher and L.F. Ruggiero. In press. The effect of snowmobile trails on coyote movements within lynx home ranges. *Journal of Wildlife Management*.
- Kuchler, A.W. 1964. Potential natural vegetation of the conterminous United States (map and manual). American Geographical Society Special Publication 36.
- Litvaitis, J.A., J.A. Sherburne, J.A. Bissonette. 1985. Influence of understory characteristics on snowshoe hare habitat use and density. *Journal of Wildlife Management* 49:866-873. .
- Losensky, J.B. 2002. "An evaluation of methods to determine the historic range of variability for selected species in the northern Rockies." Unpublished report. 12p.
- Major, A.R. 1989. Lynx (*Lynx canadensis canadensis*) (Kerr), predation patterns and habitat use in the Yukon Territory, Canada. Unpublished M.S. Thesis, State University of New York, Syracuse.
- McCord, C.M., and J.E. Cardoza. 1982. Bobcat and lynx. In J.A. Chapman and G.A. Feldhamer, editors. Wild mammals of North America biology, management and economics. Johns Hopkins University Press, Baltimore, Maryland.
- McDaniel, G.W., K.S. McKelvey, J.R. Squires, and L.F. Ruggiero. 2000. Efficacy of lures and hair snares to detect lynx. *Wildlife Society Bulletin* 28:119-123.

- McKelvey, K.S., S.W. Buskirk, C.J. Krebs. 2000a. Theoretical insights into the population viability of lynx. Chapter 2. In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.
- McKelvey, K.S., K.B. Aubry, Y.K. Ortega. 2000b. History and distribution of lynx in the contiguous United States. Chapter 8. In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.
- McKelvey, K.S., Y.K. Ortega, G. Koehler, K. Aubry, and D. Britnell. 2000c. Canada lynx habitat and topographic use patterns in north central Washington: a reanalysis. Chapter 10. In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.
- McKelvey, K.S., K.B. Aubry, J.K. Agee, S.W. Buskirk, L.F. Ruggiero, G.M. Koehler. 2000d. Lynx conservation in an ecosystem management context. In Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al., tech. eds. The scientific basis for lynx conservation in the contiguous United States. Gen. Tech. Rpt. RMRS-GTR-30. Ogden, UT: U.S. Dept. Agriculture, Forest Service, Rocky Mountain Research Station.
- Mech, L.D. 1973. Canadian lynx invasion of Minnesota. *Biological Conservation* 5:151-152.
- Mech, L.D. 1977. Record movement of a Canadian lynx. *Journal of Mammalogy* 58:676-677.
- Mech, L.D. 1980. Age, sex, reproduction, and spatial organization of lynxes colonizing northeastern Minnesota. *Journal of Mammalogy* 61:261-267.
- Merrill, G. and T. Schenk. 2006. Colorado lynx den site habitat. Progress report. September 30. U.S. Forest Service and Colorado Division of Wildlife. 4pp. .
- Merrill, G. 2005. Colorado lynx den site habitat. Progress report. September 30. U.S. Forest Service and Colorado Division of Wildlife. 4pp.
- Minnesota Department of Natural Resources. 2005. Lynx sightings in Minnesota (March 2000 – August 15, 2005). website: http://www.dnr.state.mn.us/ecological_services/nhnrp/research/lynx_sightings.html.
- Moen, R., G. Niemi, C.L. Burdett, L.D. Mech. 2004. Canada lynx in the Great Lakes region 2004 annual report to USDA Forest Service and Minnesota Cooperative Fish and Wildlife Research Unit. Natural Resources Research Institute Technical report number NRRI/TR-2004-33, Duluth, Minnesota.
- Monthey, R.W. 1986. Responses of snowshoe hares, *Lepus americanus*, to timber harvesting in northern Maine. *Canadian Field Naturalist* 100:568-570.

- Mowat, G., S. Boutin, and B.G. Slough. 1996. Using placental scars to estimate litter size and pregnancy rate in lynx. *Journal of Wildlife Management* 60:430-440.
- Mowat, G., K.G. Poole, and M. O'Donoghue. 2000. Ecology of lynx in northern Canada and Alaska. Chapter 9. *In* L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado, Boulder.
- Murray, D.L., S. Boutin, and M. O'Donoghue. 1994. Winter habitat selection by lynx and coyotes in relation to snowshoe hare abundance. *Canadian Journal of Zoology* 72:1444-1451.
- Nellis, C.H., S.P. Wetmore, and L.B. Keith. 1972. Lynx-prey interactions in central Alberta. *Journal of Wildlife Management* 36:320-329.
- O'Donoghue, M., S. Boutin, C.J. Krebs, and E.J. Hofer. 1997. Numerical responses of coyotes and lynx to the snowshoe hare cycle. *Oikos* 80:150-162.
- O'Donoghue, M., S. Boutin, C.J. Krebs, D.L. Murray, and E.J. Hofer. 1998a. Behavioural responses of coyotes and lynx to the snowshoe hare cycle. *Oikos* 82:169-183.
- O'Donoghue, M., S. Boutin, C.J. Krebs, G. Zuleta, D.L. Murray, and E.J. Hofer. 1998b. Functional responses of coyotes and lynx to the snowshoe hare cycle. *Ecology* 79:1193-1208.
- Parker, G.R. 1981. Winter habitat use and hunting activities of lynx (*Lynx canadensis*) on Cape Breton Island, Nova Scotia. *In* J.A. Chapman and D. Pursley, editors. *Proceedings of the 1980 Worldwide Furbearer Conference*, Frostburg, Maryland.
- Parker, G.R., J.W. Maxwell, L.D. Morton, and G.E. J. Smith. 1983. The ecology of the lynx (*Lynx canadensis*) on Cape Breton Island. *Canadian Journal of Zoology* 61:770-786.
- Poole, K.G. 1994. Characteristics of an unharvested lynx population during a snowshoe hare decline. *Journal of Wildlife Management* 58:608-618.
- Poole, K.G. 1997. Dispersal patterns of lynx in the Northwest Territories. *Journal of Wildlife Management* 61:497-505.
- Poole, K.G., L.A. Wakelyn, and P.N. Nicklen. 1996. Habitat selection by lynx in the Northwest Territories. *Canadian Journal of Zoology* 74:845-850.
- Quinn, N.W.S., and G. Parker. 1987. Lynx. *In* M. Novak, J.A. Barber, M.E. Obbard, B. Malloch, editors. *Wild furbearer management and conservation in North America*. Ontario Ministry of Natural Resources.
- Quinn, N.W.S., and J.E. Thompson. 1987. Dynamics of an exploited Canada lynx population in Ontario. *Journal of Wildlife Management* 51:297-305.

- Roe, A.N., K.G. Poole, and D.L. May. 1999. A review of lynx behavior and ecology and its relation to ski area planning and management. Unpublished Report, IRIS Environmental Systems. Calgary, Alberta, Canada.
- Ruediger, B. 1996. The relationship between rare carnivores and highways. Pages 24-38 in G. Evink, D. Ziegler, P. Garret, and J. Berry, editors. Transportation and wildlife: reducing wildlife mortality/ improving wildlife passageways across transportation corridors. Proceedings of the Transportation-Related Wildlife Mortality Seminar, 1996, Orlando, Florida. Florida Department of Transportation Federal Highway Administration.
- Ruediger, B., S. Mighton, B. Naney, T. Rinaldi, F. Wahl, N. Warren, D. Wenger, A. Williamson, L. Lewis, B. Holt, G. Patton, A. Vandehey, and S. Gniadek. 2000. Canada Lynx Conservation Assessment and Strategy. Unpublished interagency document prepared for the U.S. Forest Service, U.S. Fish and Wildlife Service, Bureau of Land Management and National Park Service. Missoula, Montana.
- Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.R. Squires. 2000a. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.
- Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.R. Squires. 2000b. The scientific basis for lynx conservation: can we get there from here? Chapter 18. In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.
- Saunders, J. K. 1963. Food habits of the lynx in Newfoundland. *Journal of Wildlife Management* 27:384-390.
- Slough, B.G., and G. Mowat. 1996. Population dynamics of lynx in a refuge and interactions between harvested and unharvested populations. *Journal of Wildlife Management* 60:946-961.
- Shirley, J.J., J.T. Flinders and K.D. Bunnell. No date. Winter diet selection of coyotes in northeastern Utah. *In* J.T. Flinders, principal investigator: Forest carnivores occurrence, distribution and limiting factors: Canada lynx and wolverine surveys in Utah, Final report. Unpublished. Brigham Young Univ. 108 pages.
- Squires, J.R., and T. Laurion. 2000. Lynx home range and movements in Montana and Wyoming: preliminary results. Chapter 11. In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.
- Squires, J.R. and L.F. Ruggiero. In press. Lynx prey selection in northwestern Montana. *Journal of Wildlife Management*.

- Squires, J.R., L.F. Ruggiero, and J.A. Kolbe. 2004. Ecology of lynx in western Montana, including Seeley Lake, progress report - January 2003-September 2004. Unpubl. report. U.S. Forest Service, Rocky Mountain Research Station, Missoula, Montana.
- Squires, J.R., L.F. Ruggiero, J.A. Kolbe, and N.J. DeCesare. 2006. Lynx ecology in the intermountain west. Unpubl. report. U.S. Forest Service, Rocky Mountain Research Station, Missoula, Montana.
- Staples, W.R. 1995. Lynx and coyote diet and habitat relationships during a low hare population on the Kenai peninsula, Alaska. Unpublished M.S. Thesis, University of Alaska, Fairbanks.
- Thiel, R.P. 1987. The status of Canada lynx in Wisconsin, 1865-1980. Wisconsin Academy Sciences, Arts and Letters 75:90-96.
- U.S. Fish and Wildlife Service. 2000. Biological opinion on the effects of National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans on Canada lynx (*Lynx canadensis*) in the contiguous United States. October 25, 2000. Helena, Montana.
- U.S. Fish and Wildlife Service. 2001. Biological opinion on the effects of Montana Ski Areas on Canada lynx (*Lynx canadensis*). February 9, 2001. Helena, Montana.
- U.S. Fish and Wildlife Service. 2005. Recovery outline for the contiguous United States distinct population segment of the Canada lynx.
- U.S. Fish and Wildlife Service. 2006. *in litt.* Canada lynx conservation agreement with the Forest Service. Correspondence, August 31. U.S. Fish and Wildlife Service, Portland, Oregon. 9 pp.
- U.S. Forest Service. 2004. Northern Rockies lynx amendment, draft environmental impact statement. USDA Forest Service, Missoula, Montana.
- U.S. Forest Service. 2006. Biological assessment (revised) of the Northern Rockies lynx amendment on threatened, endangered and proposed vertebrate and invertebrate species (revision of BA dated November 18, 2005). December 8. U.S. Forest Service, Region 1, Missoula, Montana.
- U.S. Forest Service. 2007. Biological assessment (revised) of the Northern Rockies lynx amendment on threatened, endangered and proposed vertebrate and invertebrate species (revision of BA dated December 8, 2006). January 4. U.S. Forest Service, Region 1, Missoula, Montana.
- U.S. Forest Service. 2007b. *in litt.* Biological Assessment and supplemental information. March 14. U.S. Forest Service, Region 1, Missoula, Montana.

- U.S. Forest Service and U.S. Fish and Wildlife Service. 2000. Canada lynx conservation agreement between the U.S. Fish and Wildlife Service and the U.S. Forest Service. U.S. Forest Service Agreement Number 00-MU-11015600-013. Denver, Colorado. .
- U.S. Forest Service and U.S. Fish and Wildlife Service. 2005. Revised Canada lynx conservation agreement between the U.S. Fish and Wildlife Service and the U.S. Forest Service. U.S. Forest Service Agreement 00-MU-11015600-013. Denver, Colorado. .
- U.S. Forest Service and U.S. Fish and Wildlife Service. 2006. Amended Canada lynx conservation agreement between the U.S. Fish and Wildlife Service and the U.S. Forest Service. U.S. Forest Service Agreement 00-MU-11015600-013. Denver, Colorado.
- van Zyll de Jong, C.G. 1966. Food habits of the lynx in Alberta and the Mackenzie District, North West Territories. *Canadian Field Naturalist* 80:18-23.
- Vashon, J.H., A.L. Meehan, W.J. Jakubas, J. F. Organ, A.D. Vashon, C.R. McLaughlin, and G.J. Matula, Jr. 2005a. Preliminary diurnal home range and habitat use by Canada lynx (*Lynx canadensis*) in northern Maine. Unpubl. report, Maine Department of Inland Fisheries and Wildlife, Bangor.
- Vashon, J.H., J.F. Organ, W.J. Jakubas, A.D. Vashon, G.J. Matula Jr., C.R. McLaughlin, and S.M. Crowley. 2005b. Reproduction and mortality of Canada lynx (*Lynx canadensis*) in northern Maine. Unpubl. report, Maine Department of Inland Fisheries and Wildlife, Bangor.
- Ward, R., and C.J. Krebs. 1985. Behavioural responses of lynx to declining snowshoe hare abundance. *Canadian Journal of Zoology* 63:2817-2824.
- Washington Department of Wildlife. 1993. Status of the North American lynx (*Lynx canadensis*) in Washington. Unpublished report. Washington Department of Wildlife, Olympia.
- Wolfe, M.L., N.V. Debyle, C.S. Winchell, T.R. McCabe. 1982. Snowshoe hare cover relationships in northern Utah. *Journal of Wildlife Management* 49:662-670.
- Wolff, J.O. 1980. The role of habitat patchiness in the population dynamics of snowshoe hares. *Ecological Monographs* 50

From: Belleman, Ann
To: [Solberg-Schwab, Lisa](#)
Subject: Re: Good news!
Date: Tuesday, October 21, 2014 9:24:48 AM
Attachments: [Final NRLA BO 3 23 07.pdf](#)
[Final NRLA BO appendices 3 23 07.pdf](#)
[LCAS Revised August2013.pdf](#)

The NRLA/NRLMD BiOp and the new LCAS attached. The details will come, so don't be overwhelmed. The important thing is you already know the basics, or they'll come back to you quickly, and you have field knowledge. The biggest change is VEG S6 and understanding that. But Gary can help you. Maybe you can schedule some time with him in Jackson once you're on "our" dime, or maybe he'll be in Pinedale for some upcoming meeting.

Ann Belleman
U.S. Fish and Wildlife Service
Wyoming Ecological Svcs. Field Office
5353 Yellowstone Rd., Suite 308A
Cheyenne, WY 82009

ann_belleman@fws.gov

307-421-5839 (work cell)
307-772-2374 (FWS-Cheyenne)
218-529-5171 (EPA-MN)

On Tue, Oct 21, 2014 at 9:18 AM, Belleman, Ann <ann_belleman@fws.gov> wrote:

We'll talk soon, but a couple of quick responses ...

First - Mikaela is a cutie! Thanks for sending the photo!

Re: office location - I've been teleworking 3 days at home and 2 days in a cubie at the EPA lab in Duluth. I don't have set days I work one place or the other - it all depends on what calls I have, etc. (This arrangement was based on Mark S's desire that I have some physical connection w/a federal building.) I have a work cell that I will turn in next June and also a landline at home; I also have a work vehicle and maybe you'll get it next - I'll return it likely this winter. So as you and Tyler consider your work location, and just in case NRCS doesn't work out, there are ways to get out of the office. If you get stuck at BLM, could you have your cubie moved away from nosey people? Just some thoughts.

Re: lynx stuff - we'll talk - but in the meantime, yes, there are still the minimal thresholds in the new LCAS; however, it did away with the words "standards" and "guidelines." I'll forward it - I printed it out, as it's not available in hard copy. The NRLMD is more of a challenge and I suggest you start getting acquainted w/VEG S6 as well as the FWS' biological opinion, which says some things that aren't in the NRLMD. You'll need to pay attention to WUIs in particular, which is an upcoming issue. I'm guessing you can get hard copies of the EIS - you'll need Vol. I - and the ROD. I've got a lot of lynx stuff here that I'll bring back to WY in Jan. or Feb.; I could also mail some of it beforehand. Again, we'll talk.

Finally, you'll definitely want to spend some time with Gary Hanvey asap to discuss the lynx stuff. He's a wealth of info, is one of the old timers when it comes to lynx, and may not be around for long - hard to say. I know he's been considering both a new job and retirement (please don't share this), so when he goes, so does most of the gritty type of integrity of the NT's biology program. He really knows forestry and that's what he can also help with.

Ann Belleman
U.S. Fish and Wildlife Service
Wyoming Ecological Svcs. Field Office
5353 Yellowstone Rd., Suite 308A
Cheyenne, WY 82009

ann_belleman@fws.gov

307-421-5839 (work cell)
307-772-2374 (FWS-Cheyenne)
218-529-5171 (EPA-MN)

On Tue, Oct 21, 2014 at 8:51 AM, Solberg-Schwab, Lisa <lsolbergschwab@blm.gov> wrote:

Ann,

It is good news, i'm really excited. I've been wanting to get back to the service ever since I got to WY :)

My baby girls name is Mikaela she was born on July 10 she is three months old now. I've attached a photo.

I start my new job on Nov 16. Tyler told me about your transition, i'm glad we will have time for you to get me up to speed and mentor me. when i worked for the service before I was only working on informal consultations so I know i'll have a lot of questions about that let alone the details about the species. i know it'll be different from the other side of consultation. and i for sure need your mentorship on the LAU calculations and so forth. i haven't read through the new lcas so maybe the thresholds are not in there anymore?

anyway lots for us to catch up on, i'm hoping tyler negotiates for me to have a spot over at the NRCS, I don't really want to get into arguments with the pinedale bios when they overhear my conversations with you.

thanks for all your help and friendship over the years. I know you and pauline helped me a lot in getting this job!!

Lisa

On Tue, Oct 21, 2014 at 8:00 AM, Belleman, Ann <ann_belleman@fws.gov> wrote:

Hi Lisa,

I hope you're doing well and enjoying parenthood! I heard you had a baby girl but don't

know her name - or - age (a few months?).

Also, congratulations on the new job! This is terrific news and I'm thrilled you'll be with "us" now! Imagine we'll talk soon. At this point, I don't know how much of my work you'll pick up ... some, most? Both lynx and grizz? But we'll all know soon enough! You may've heard that I'm switching to part-time for WY FO sometime in January and will work part-time for MN-WI FO, then switch to full time for MN-WI next June - leaving WY altogether. This change hopefully will give us both time to transition/get up to speed on stuff.

I don't know your work schedule or when you'll start w/FWS, but let me know and I can call you whenever it's convenient to talk.

Cheers - Ann

Ann Belleman
U.S. Fish and Wildlife Service
Wyoming Ecological Svcs. Field Office
5353 Yellowstone Rd., Suite 308A
Cheyenne, WY 82009

ann_belleman@fws.gov

307-421-5839 (work cell)
307-772-2374 (FWS-Cheyenne)
218-529-5171 (EPA-MN)

--

Lisa M. Solberg Schwab
Wildlife Biologist, Wyoming State Office
WY SG 9 Plan Project Manager
located at the Pinedale Field Office
P.O. Box 768, 1625 W. Pine Street
Pinedale, WY 82941
(307) 367-5340

From: [Matt Hogan](#)
To: [Noreen Walsh](#)
Subject: FW: Standing up for Montana
Date: Wednesday, October 29, 2014 11:55:25 AM

Not sure that was helpful.

From: Michael Thabault [mailto:michael_thabault@fws.gov]
Sent: Wednesday, October 29, 2014 11:54 AM
To: Noreen Walsh; Matt Hogan
Subject: Fwd: Standing up for Montana

FYI results of an interview I did with FWP monthly publication. In case Jeff calls.

Michael Thabault
Assistant Regional Director
Ecological Services
Mountain Prairie Region

Begin forwarded message:

From: "Fahey, Bridget" <bridget_fahey@fws.gov>
Date: October 29, 2014 at 10:43:29 AM PDT
To: Michael Thabault <michael_thabault@fws.gov>
Subject: Fwd: Standing up for Montana

Whoa, Mike! Feeling punchy!

Bridget Fahey
Chief of Endangered Species
Mountain Prairie Region
(303) 236-4258

----- Forwarded message -----

From: Zelenak, Jim <jim_zelenak@fws.gov>
Date: Wed, Oct 29, 2014 at 9:49 AM
Subject: Standing up for Montana
To: Bridget Fahey <bridget_fahey@fws.gov>, Justin Shoemaker <justin_shoemaker@fws.gov>, Leith Edgar <leith_edgar@fws.gov>
Cc: Lori Nordstrom <lori_nordstrom@fws.gov>, Katrina Dixon <katrina_dixon@fws.gov>, Jeff Berglund <jeff_berglund@fws.gov>

"It's like walking three miles a day and going on a diet. No one wants to do that, but it beats having a heart attack."

The Canada Lynx listing in 2000 has since halted timber harvest across much of western Montana. Were it to occur, the listing of sage-grouse, warns Hagener, would threaten activities in the bird's range connected to federal funding, including Farm Bill subsidies, CRP payments, and grazing leases on BLM land. "Many people don't understand how bad things could get," says Hagener. "If the sage-grouse is listed, we'd end up with the USFWS dictating farming, ranching, and oil and gas development across much of eastern and southwestern Montana."

“Chest thumping and rhetoric can make it tough for us to convince the courts and other federal agencies that a state is really serious [about conserving at-risk species],” says Mike Thabault, an assistant regional director with the USFWS. “We know that a lot of it is just bluster, but the general public often doesn’t.”

<http://fwp.mt.gov/mtoutdoors/HTML/articles/2014/ESA2014.htm#.VFEHmflDVMU>

--

Jim Zelenak
Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Matt Hogan](#)
To: [Noreen Walsh](#)
Subject: Fwd: Lynx 5 year review
Date: Monday, March 16, 2015 8:47:43 PM

Have you heard concerns from states?

Begin forwarded message:

From: "Frazer, Gary" <gary_frazer@fws.gov>
Date: March 16, 2015 at 8:02:43 PM MDT
To: Michael Thabault <Michael_Thabault@fws.gov>
Cc: Noreen Walsh <Noreen_Walsh@fws.gov>, Matt Hogan <Matt_Hogan@fws.gov>, Paul Phifer <Paul_Phifer@fws.gov>, Jeff Newman <jeff_newman@fws.gov>, Gina Shultz <Gina_Shultz@fws.gov>
Subject: Lynx 5 year review

Mike -- Thanks for the info on the plans for a new 5 year review on lynx. The new AFWA science advisor, Jonathan Mawdsley, gave a presentation on lynx at last week's T&E Policy committee meeting that mentioned the 5 year review.

It generated comments Chad Bishop and someone who I think was from MT FWP about how they felt dissed the last time around (presumably the revised CH and DPS boundary), when some State lynx expert contributed greatly to the draft finding but was then locked out of the final decision without explanation. At least that's how they described it.

And after the meeting, Jim Connolly, Director of the Bureau of Resource Management for Maine Inland Fish and Wildlife, came up and expressed his great interest in working with the Service on the updated 5 year review.

Don't know how far along you are and what the plans are for conducting this review, but there is clearly a strong desire on the part of some lynx states to be part of the process. I know it adds complexity, but I think it would be wise to include interested states. -- GDF

Gary Frazer
Assistant Director -- Ecological Services
U.S. Fish and Wildlife Service
(202) 208-4646

From: [Matt Hogan](#)
To: [Kristine Martin](#); [Stephen Torbit](#)
Subject: Re: Meeting: Colorado landowner/NGO delegation about Wolf Creek Pass
Date: Thursday, June 18, 2015 1:22:06 PM

Looping in Torbit as don't have agenda with me to know if that is possible.

Matt Hogan
Deputy Regional Director
Mountain-Prairie Region
U.S. Fish & Wildlife Service
303-236-7920

On Jun 18, 2015, at 2:18 PM, Kristine Martin <kristine_martin@fws.gov> wrote:

Matt,
Can you and/or Noreen do this call from Kansas? It would be 8:30 CST.

v/r
Kris Martin

From: Sellars, Roslyn [mailto:roslyn_sellars@fws.gov]
Sent: Thursday, June 18, 2015 11:36 AM
To: susan@wildlandsnetwork.org
Cc: Irwin, Thomas; Kristine Martin
Subject: Meeting: Colorado landowner/NGO delegation about Wolf Creek Pass

I have sent our an electronic calendar invite from Steve Guertin. Please confirm the number in your group so we can determine what size meeting room is needed. Staff in our Colorado have been invited to join in by phone.

Our address is 1849 C Street NW. Visitors should enter the building on C Street and proceed to the security desk to check in. A Government issued photo ID will be needed to get cleared into the building. You will also need to give security the name of the person you will be meeting with (Steve Guertin), our room number 3356 and our telephone (202-208-4545) for clearance. Security will call us to confirm your meeting, issue a temporary badge and then send you upstairs to our office. We are in the hallway next to the 2nd set of elevators on the 3rd floor.

Roslyn Sellars
Please copy Thomas Irwin (thomas_irwin@fws.gov) on future emails related to scheduling.
Executive Assistant | Office of the Director | U.S. Fish and Wildlife Service
1849 C Street NW | Room 3356 | Washington, DC | (202) 208-4545 | roslyn_sellars@fws.gov

On Thu, Jun 18, 2015 at 12:44 PM, <susan@wildlandsnetwork.org> wrote:
Hi Tim

Thanks so much. How about 9:30 on Wednesday? Thanks, Susan

-----Original Message-----

From: "Irwin, Thomas" <thomas_irwin@fws.gov>
Sent: Wednesday, June 17, 2015 11:46am
To: susan@wildlandsnetwork.org
Cc: "Sellars, Roslyn" <roslyn_sellars@fws.gov>, "Anna Munoz" <anna_munoz@fws.gov>
Subject: Re: MEETING REQUEST with Colorado landowner/NGO delegation about Wolf Creek Pass

Steve Guertin's availability:

Wednesday, June 24

9:00a.m. - 1:00p.m.

3:00p.m. - 5:00p.m.

Thomas

thomas_irwin@fws.gov - (202) 208-4545
Office of the Director - 1849 C Street NW - Room 3356 - Washington, DC 20240

On Wed, Jun 17, 2015 at 11:43 AM, <susan@wildlandsnetwork.org> wrote:
Thanks Thomas. Let me check with my group and get right back with you. Would that be for 3:30 on Wednesday as well?

Susan

-----Original Message-----

From: "Irwin, Thomas" <thomas_irwin@fws.gov>
Sent: Wednesday, June 17, 2015 11:39am
To: susan@wildlandsnetwork.org
Cc: "Sellars, Roslyn" <roslyn_sellars@fws.gov>, "Anna Munoz" <anna_munoz@fws.gov>
Subject: Re: MEETING REQUEST with Colorado landowner/NGO delegation about Wolf Creek Pass

Susan,

June 23 doesn't work for the director and Gary Frazer, Assistant Director for Ecological Services is out of the office June 16 - 26.

Would meeting with Steve Guertin, FWS Deputy Director of Operations, here at Main Interior work? He is available on Wednesday, June 24 at 3:00p.m.

Thomas

thomas_irwin@fws.gov - (202) 208-4545
Office of the Director - 1849 C Street NW - Room 3356 - Washington, DC 20240

On Wed, Jun 17, 2015 at 11:09 AM, <susan@wildlandsnetwork.org> wrote:
Dear Thomas,

Would it be possible to change the meeting to Tuesday or to meet with Gary Fraser. This group is coming all the way to DC to speak with the folks at Washington office.

I will follow up with a call later today.

Thanks, Susan

-----Original Message-----

From: "Irwin, Thomas" <thomas_irwin@fws.gov>

Sent: Wednesday, June 17, 2015 11:03am

To: susan@wildlandsnetwork.org

Cc: "Sellars, Roslyn" <Roslyn_Sellars@fws.gov>, "Anna Munoz" <anna_munoz@fws.gov>

Subject: Re: MEETING REQUEST with Colorado landowner/NGO delegation about Wolf Creek Pass

Ms. Holmes,

Our director has been invited to attend/speak at the 2015 U.S.-China Strategic & Economic Dialogue being held at the State Department on Wednesday, June 24. Unfortunately, this event conflicts with being able to meet with you and your group.

After further discussion, it has been recommended we forward your meeting request to our Mountain-Prairie Regional Office in Lakewood, Colorado for appropriate action.

Please contact Kristine Martin at (303) 236-7920 or via email:

kristine_martin@fws.gov for the regional director and/or deputy's availability.

Regards,

Thomas

thomas_irwin@fws.gov - (202) 208-4545

Office of the Director - 1849 C Street NW - Room 3356 - Washington, DC 20240

On Mon, Jun 15, 2015 at 2:34 PM, <susan@wildlandsnetwork.org> wrote:

Dear Thomas,

Great to speak with you today. I am writing to confirm a meeting for a delegation of individuals with to discuss protection of Wolf Creek Pass in Colorado. We appreciate Director Ashe's support of conserving Colorado's wildlife would like to discuss our concerns about possible future development in Wolf Creek Pass. As per our conversation, we have tentatively scheduled a meeting with Mr. Ashe at 2:00 on Wednesday, June 24th. We do have flexibility at this point and could also do 3:00 or 4:00.

Wolf Creek Pass straddles the Continental Divide between two of the largest intact wilderness areas in the Southern Rockies – the Weminuche and South San Juan wildernesses. It is a critical area for the movement of wildlife such as lynx and wolverine. Recently, the Forest Service finalized a Record of Decision (ROD), which could set the stage for a large scale development – 10,000 year round residents in over 1,700 units -- in some of the most important wildlife habitat in the heart of Wolf Creek Pass. If this

development goes forward, one of the most important wildlife corridors in the Continental Divide would be forever lost in addition to other serious effects on water, fire safety and the scenic beauty of our Colorado wild spaces.

The Administration still has time to reconsider this development and take steps that could reverse this decision. That is why this group is coming together now to speak to key policy-makers.

Our delegation includes land owners from the area as well as NGOs working on lands and wildlife conservation:

Lavinia Currier -- Catspaw Ranch – A conservationist and rancher in Colorado, she has served on the Board of World Wildlife Foundation and Bull Run Mountain Conservancy and is President of Sacharuna Foundation.

Lori Udall -- President and founder of Montpelier Consulting, LLC. Carrying on her family's legacy of championing lands conservation, she has worked with International Rivers Network, Environmental Defense Fund and First Nations Development Institute.

Monique DiGiorgio -- Executive Director, Chama Peak Alliance, Durango, CO. The Chama Peak Land Alliance is an association of conservation minded landowners interested in working together on common issues and problems in the southern San Juan Mountains of Colorado and New Mexico.

Jimbo Buickerood -- Public Lands Coordinator, San Juan Citizens Alliance, Durango, CO (SJCA) SJCA is an alliance of citizens working on a range of issues in the region including climate change, coal mines and power plants, rivers, oil and gas development, forest health and lands protections.

Susan Holmes – Connectivity Policy Coalition (CPC) Coordinator, Washington, DC. The CPC is a coalition of national and regional groups working to advance landscape and wildlife connectivity through federal policy.

Please let me know when Mr. Bonnie might be available. I can best be reached on email or on the cell number below.

Very warmest regards,

Susan
Susan A. Holmes
Connectivity Policy Coalition
Washington, DC
202-329-1553 cell

From: [Matt Hogan](#)
To: [Stephen Torbit](#)
Cc: [Kristine Martin](#)
Subject: Re: Meeting: Colorado landowner/NGO delegation about Wolf Creek Pass
Date: Thursday, June 18, 2015 5:08:47 PM

Let's not change the schedule. We will call in if we have a signal. Thanks.

On Jun 18, 2015, at 5:29 PM, Stephen Torbit <Stephen_Torbit@fws.gov> wrote:

Matt: We are scheduled to be driving across the Flint Hills from 8 am to approximately 9 am. I have no idea if we will have cell coverage, I have sent that question on to our Kansas folks. If we have a signal, then you should be able to take it, if not we may have to delay our departure that morning so you can take the call. I am guessing the call would take about an hour. So, I will get back to you after I get the info from Kansas.

I can give you background on this before the call if you would like. I worked on this issue way back when (mid-80s). So, let me know if you would like some background too.

ST

Stephen Torbit Ph.D.
ARD - Science Applications
Region 6
Fish and Wildlife Service
Office: 303-236-4602
Cell: 720-626-7504
stephen_torbit@fws.gov

From: Matt Hogan [mailto:matt_hogan@fws.gov]
Sent: Thursday, June 18, 2015 1:22 PM
To: Kristine Martin; Stephen Torbit
Subject: Re: Meeting: Colorado landowner/NGO delegation about Wolf Creek Pass

Looping in Torbit as don't have agenda with me to know if that is possible.

Matt Hogan
Deputy Regional Director
Mountain-Prairie Region
U.S. Fish & Wildlife Service
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Roslyn Sellars

Please copy Thomas Irwin (thomas_irwin@fws.gov) on future emails related to scheduling.

Executive Assistant | Office of the Director | U.S. Fish and Wildlife Service

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9:00a.m. - 1:00p.m.

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Subject: Re: MEETING REQUEST with Colorado landowner/NGO delegation
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Office of the Director - 1849 C Street NW - Room 3356 - Washington, DC 20240

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Please let me know when Mr. Bonnie might be available. I can best be reached on email or on the cell number below.

Very warmest regards,

Susan
Susan A. Holmes
Connectivity Policy Coalition
Washington, DC
202-329-1553 cell

From: [Matt Hogan](#)
To: [Stephen Torbit](#)
Cc: [Kristine Martin](#)
Subject: Re: Meeting: Colorado landowner/NGO delegation about Wolf Creek Pass
Date: Thursday, June 18, 2015 5:09:22 PM

If Nicole is acting she can call in for us as well.

On Jun 18, 2015, at 5:29 PM, Stephen Torbit <Stephen_Torbit@fws.gov> wrote:

Matt: We are scheduled to be driving across the Flint Hills from 8 am to approximately 9 am. I have no idea if we will have cell coverage, I have sent that question on to our Kansas folks. If we have a signal, then you should be able to take it, if not we may have to delay our departure that morning so you can take the call. I am guessing the call would take about an hour. So, I will get back to you after I get the info from Kansas.

I can give you background on this before the call if you would like. I worked on this issue way back when (mid-80s). So, let me know if you would like some background too.

ST

Stephen Torbit Ph.D.
ARD - Science Applications
Region 6
Fish and Wildlife Service
Office: 303-236-4602
Cell: 720-626-7504
stephen_torbit@fws.gov

From: Matt Hogan [mailto:matt_hogan@fws.gov]
Sent: Thursday, June 18, 2015 1:22 PM
To: Kristine Martin; Stephen Torbit
Subject: Re: Meeting: Colorado landowner/NGO delegation about Wolf Creek Pass

Looping in Torbit as don't have agenda with me to know if that is possible.

Matt Hogan
Deputy Regional Director
Mountain-Prairie Region
U.S. Fish & Wildlife Service
303-236-7920

On Jun 18, 2015, at 2:18 PM, Kristine Martin <kristine_martin@fws.gov> wrote:

Matt,
Can you and/or Noreen do this call from Kansas? It would be 8:30 CST.

v/r
Kris Martin

From: Sellars, Roslyn [mailto:roslyn_sellars@fws.gov]
Sent: Thursday, June 18, 2015 11:36 AM
To: susan@wildlandsnetwork.org
Cc: Irwin, Thomas; Kristine Martin
Subject: Meeting: Colorado landowner/NGO delegation about Wolf Creek Pass

I have sent our an electronic calendar invite from Steve Guertin. Please confirm the number in your group so we can determine what size meeting room is needed. Staff in our Colorado have been invited to join in by phone.

Our address is 1849 C Street NW. Visitors should enter the building on C Street and proceed to the security desk to check in. A Government issued photo ID will be needed to get cleared into the building. You will also need to give security the name of the person you will be meeting with (Steve Guertin), our room number 3356 and our telephone (202-208-4545) for clearance. Security will call us to confirm your meeting, issue a temporary badge and then send you upstairs to our office. We are in the hallway next to the 2nd set of elevators on the 3rd floor.

Roslyn Sellars

Please copy Thomas Irwin (thomas_irwin@fws.gov) on future emails related to scheduling.

Executive Assistant | Office of the Director | U.S. Fish and Wildlife Service

1849 C Street NW | Room 3356 | Washington, DC | (202) 208-4545 | roslyn_sellars@fws.gov

On Thu, Jun 18, 2015 at 12:44 PM, <susan@wildlandsnetwork.org> wrote:
Hi Tim

Thanks so much. How about 9:30 on Wednesday? Thanks, Susan

-----Original Message-----

From: "Irwin, Thomas" <thomas_irwin@fws.gov>

Sent: Wednesday, June 17, 2015 11:46am

To: susan@wildlandsnetwork.org

Cc: "Sellars, Roslyn" <roslyn_sellars@fws.gov>, "Anna Munoz" <anna_munoz@fws.gov>

Subject: Re: MEETING REQUEST with Colorado landowner/NGO delegation about Wolf Creek Pass

Steve Guertin's availability:

Wednesday, June 24

9:00a.m. - 1:00p.m.

3:00p.m. - 5:00p.m.
Thomas

thomas_irwin@fws.gov - (202) 208-4545
Office of the Director - 1849 C Street NW - Room 3356 - Washington, DC
20240

On Wed, Jun 17, 2015 at 11:43 AM, <susan@wildlandsnetwork.org> wrote:
Thanks Thomas. Let me check with my group and get right back with you.
Would that be for 3:30 on Wednesday as well?

Susan

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Subject: Re: MEETING REQUEST with Colorado landowner/NGO delegation
about Wolf Creek Pass

Susan,
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Assistant Director for Ecological Services is out of the office
June 16 - 26.
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Operations, here at Main Interior work? He is available on
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Subject: Re: MEETING REQUEST with Colorado landowner/NGO delegation about Wolf Creek Pass

Ms. Holmes,

Our director has been invited to attend/speak at the 2015 U.S.-China Strategic & Economic Dialogue being held at the State Department on Wednesday, June 24. Unfortunately, this event conflicts with being able to meet with you and your group.

After further discussion, it has been recommended we forward your meeting request to our Mountain-Prairie Regional Office in Lakewood, Colorado for appropriate action.

Please contact Kristine Martin at (303) 236-7920 or via email: kristine_martin@fws.gov for the regional director and/or deputy's availability.

Regards,

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From: [Matt Hogan](#)
To: [Stephen Torbit](#)
Subject: Re: Meeting: Colorado landowner/NGO delegation about Wolf Creek Pass
Date: Friday, June 19, 2015 8:35:35 AM

Ok thanks. Be curious what the fws nexus is...Lynx?

On Jun 19, 2015, at 8:30 AM, Stephen Torbit <Stephen_Torbit@fws.gov> wrote:

Just heard from Disney, he says the coverage can be spotty and you might get a signal. You could give it a try, but someone like Nicole should back you up.

ST

Stephen Torbit Ph.D.
ARD - Science Applications
Region 6
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From: [Matt Hogan](#)
To: [Noreen Walsh](#)
Subject: Re: talking points for Lynx SSA and Recovery planning
Date: Tuesday, September 15, 2015 4:06:55 PM

That the lead RD seems like an afterthought!

Matt Hogan
Deputy Regional Director
Mountain-Prairie Region
U.S. Fish & Wildlife Service
303-236-7920

On Sep 15, 2015, at 3:01 PM, Noreen Walsh <noreen_walsh@fws.gov> wrote:

Anything strange?

*Noreen Walsh
Regional Director
Mountain-Prairie Region
U. S. Fish and Wildlife Service
303 236 7920*

From: Bush, Jodi [mailto:jodi_bush@fws.gov]
Sent: Tuesday, September 15, 2015 3:18 PM
To: Gary Frazer; Noreen Walsh
Cc: Jim Zelenak; Seth Willey; Nicole Alt
Subject: Re: talking points for Lynx SSA and Recovery planning

Hi Gary. Some updates.

I am also adding Noreen on this email as Seth suggested.

Updates to talking points below.

- The Service core team with input from our State partners has identified the expert panelists that will be part of the Lynx SSA. We will share this final list with our partners prior to our monthly call on September 30th.
- We believe, and in discussions with Jonathan Mawsdley of AFWA -he agrees, that we have good representation of State experts among our group of panelists. We considered expertise, range, geographic equity, redundancy and state interest in our identification of panelists.
- Besides the involvement of State experts on the panel, we also will have several State observers in attendance at the SSA workshop. These observers are expected to be liasons to the all states within the range of the lynx.

Please feel free to give me a call if you have questions. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Fri, Sep 11, 2015 at 2:24 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:

Hey Gary. Not much has changed since I sent these in July but here you go.

- The Service is working on a Lynx Recovery Plan in response to court ordered settlement using the Species Status Assessment process (SSA).
- The SSA is a structured, transparent, and scientifically-robust status, threat, and viability assessment that is intended to provide the scientific underpinnings for all determinations the Service is required to make in accordance with the Act.
- Since July of this year, the Service has been coordinating with States and other partners and seeking input from objective, independent experts in lynx ecology, habitat, management, and climate modeling to assess the current status and likely future viability of lynx populations within the DPS.
- We have been holding monthly calls with State wildlife management agencies within the range of the Lynx DPS to provide updates on our SSA progress.
- We have also requested and received input from the States on candidates to participate in an expert elicitation workshop that will be held. This workshop is scheduled for mid-October in Minnesota.
- The Service will continue to seek input at appropriate times during the process regarding the biological status of, and potential threats to, lynx populations within the DPS.
- The State coordination calls happen the last Wednesday of every month (starting July 29) at 1pm, MTN time. We have 15 states involved with some level of representation.
- We are working closely with Jonathan Mawdsley at AFWA to make sure we are as inclusive as possible while not undermining the SSA process.
- To ensure that our assessment will be as accurate and complete as possible, we will use the best scientific and commercial data available in the development of the SSA report.
- We hope to complete the SSA report by December of 2015 and then begin the recovery planning process.
- The Service intends to complete a recovery plan for the lynx DPS by January 15, 2018 in order to meet the court-ordered deadline.
- We continue to welcome any scientific information (e.g., survey results, habitat assessments, modeling efforts, implementation and/or monitoring of conservation measures, verified observations) you wish to provide for our consideration regarding the status, distribution, and likely future condition of lynx and snowshoe hare (*Lepus americanus*) populations and habitats.
- We appreciate the States interest and involvement in Lynx recovery and look forward to continued collaboration throughout this process.

FYI. The SSA process should also meet our need to complete a five year review but we are no longer focusing on that. Feel free to give me a call if you have any questions -thanks. JB

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From: [Matt Hogan](#)
To: [Noreen Walsh](#)
Subject: Re: talking points for Lynx SSA and Recovery planning
Date: Tuesday, September 15, 2015 4:23:54 PM

I already know where I stand

Matt Hogan
Deputy Regional Director
Mountain-Prairie Region
U.S. Fish & Wildlife Service
303-236-7920

On Sep 15, 2015, at 3:22 PM, Noreen Walsh <noreen_walsh@fws.gov> wrote:

And the lead DRD is still missing.

But.....even the ARD was omitted.

*Noreen Walsh
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U. S. Fish and Wildlife Service
303 236 7920*

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Subject: Re: talking points for Lynx SSA and Recovery planning
Date: Wednesday, September 16, 2015 1:08:55 AM

Many times....I'm with you!!

Matt Hogan
Deputy Regional Director
Mountain-Prairie Region
U.S. Fish & Wildlife Service
303-236-7920

On Sep 15, 2015, at 3:46 PM, Noreen Walsh <noreen_walsh@fws.gov> wrote:

Hey, have I mentioned I HATE WEDDING PLANNING?

*Noreen Walsh
Regional Director
Mountain-Prairie Region
U. S. Fish and Wildlife Service
303 236 7920*

From: Matt Hogan [mailto:matt_hogan@fws.gov]
Sent: Tuesday, September 15, 2015 4:24 PM
To: Noreen Walsh
Subject: Re: talking points for Lynx SSA and Recovery planning

I already know where I stand

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From: Matt Hogan [mailto:matt_hogan@fws.gov]
Sent: Tuesday, September 15, 2015 4:07 PM
To: Noreen Walsh
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That the lead RD seems like an afterthought!

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To: Gary Frazer; Noreen Walsh
Cc: Jim Zelenak; Seth Willey; Nicole Alt
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Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
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(406) 449-5225, ext.205

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Date: Wednesday, September 16, 2015 8:49:09 AM

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From: [Matt Hogan](#)
To: [Noreen Walsh](#)
Subject: Re: talking points for Lynx SSA and Recovery planning
Date: Wednesday, September 16, 2015 8:57:29 AM

Hard to tell but it just seemed to spark all of a sudden around the time of the banquet.

Matt Hogan
Deputy Regional Director
Mountain-Prairie Region
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On Sep 16, 2015, at 7:54 AM, Noreen Walsh <noreen_walsh@fws.gov> wrote:

yes of course

I am still curious if they asked Jodi that and she said no - did you find out?

Noreen Walsh
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From: [Matt Hogan](#)
To: [Jodi Bush](#)
Cc: [Michael Thabault](#); [Noreen Walsh](#); [Richard Hannan](#)
Subject: Lynx SSA
Date: Wednesday, September 16, 2015 9:01:25 AM

Jodi,

Hope you are well. I understand you have been working hard to get the Lynx SSA team organized. Both Rich Hannan and I had states come up to us at AFWA last night and ask us to expand the team by two additional state folks so all 5 geographic areas with the range are represented. The two areas are the Pacific Northwest and Upper Midwest (MN I believe). I understand you have been working with Jonathan Mawdsley at AFWA on this. Can you reach out to him to find out who the additional two folks should be. Thanks very much.

Matt

Matt Hogan
Deputy Regional Director
Mountain-Prairie Region
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303-236-7920

From: [Matt Hogan](#)
To: [Noreen Walsh](#)
Subject: FW: talking points for Lynx SSA and Recovery planning
Date: Thursday, September 17, 2015 8:21:10 AM

Why wouldn't we allow all the states that wanted to participate a seat at the table?

From: Noreen Walsh [mailto:noreen_walsh@fws.gov]
Sent: Wednesday, September 16, 2015 4:53 PM
To: Frazer, Gary
Cc: Jodi Bush; Michael Thabault; Matt Hogan
Subject: Re: talking points for Lynx SSA and Recovery planning

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On Sep 16, 2015, at 9:12 AM, Frazer, Gary <gary_frazer@fws.gov> wrote:

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 - Since July of this year, the Service has been coordinating with States and other partners and seeking input from objective, independent experts in lynx ecology, habitat, management, and climate modeling to assess the current status and likely future viability of lynx populations within the DPS.
 - We have been holding monthly calls with State wildlife management agencies within the range of the Lynx DPS to provide updates on our SSA progress.
 - We have also requested and received input from the States on candidates to participate in an expert elicitation workshop that will be held. This workshop is scheduled for mid-October in Minnesota.
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 - The State coordination calls happen the last Wednesday of every month (starting July 29) at 1pm, MTN time. We have 15 states involved with some level of representation.

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- The Service intends to complete a recovery plan for the lynx DPS by January 15, 2018 in order to meet the court-ordered deadline.
- We continue to welcome any scientific information (e.g., survey results, habitat assessments, modeling efforts, implementation and/or monitoring of conservation measures, verified observations) you wish to provide for our consideration regarding the status, distribution, and likely future condition of lynx and snowshoe hare (*Lepus americanus*) populations and habitats.
- We appreciate the States interest and involvement in Lynx recovery and look forward to continued collaboration throughout this process.

FYI. The SSA process should also meet our need to complete a five year review but we are no longer focusing on that. Feel free to give me a call if you have any questions -thanks. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

From: [Matt Hogan](#)
To: [Michael Thabault](#); [Noreen Walsh](#)
Cc: [Gary Frazer](#); [Jodi Bush](#)
Subject: RE: talking points for Lynx SSA and Recovery planning
Date: Thursday, September 17, 2015 3:27:14 PM

I think this all developed rather quickly and therefore they took advantage of talking to the Service folks there. I believe Jonathan thought all was good until AFWA.

That said, there are two concerns: 1) state participation and 2) timeframe. On the first one, Noreen and my general hope is that we can accommodate the states on participation. As the only other entity with mgt authority, it seems like we would want the buy in from states across the range. As to timeframe, having something done by the EOY does sound pretty ambitious and would ask that you work with the states to try to come to a mutually agreed upon resolution.

If either you (Mike) or Jodi could call Jonathan to resolve, that would be great. His number is 202-997-6628. Thanks.

From: Thabault, Michael [mailto:michael_thabault@fws.gov]
Sent: Thursday, September 17, 2015 3:20 PM
To: Noreen Walsh
Cc: Frazer, Gary; Jodi Bush; Matt Hogan
Subject: Re: talking points for Lynx SSA and Recovery planning

Just to add to the fray as I expressed to Matt today, if the states have issues then rather than letting things fester pick up the phone and call somebody. If Johnathon was having issues or was aware of particular state angst, he knows who I am. Please have him contact me so we can work it out. Sorry for the whine.

Michael Thabault
Assistant Regional Director
Ecological Services
U.S. Fish and Wildlife Service
Mountain Prairie Region
303-236-4210
michael_thabault@fws.gov

On Wed, Sep 16, 2015 at 4:53 PM, Noreen Walsh <noreen_walsh@fws.gov> wrote:
Thanks for the update Gary and Jodi for all the work on this process!
Looping in Matt who has been also working with the states on including representation from 5 areas.

Noreen Walsh
Regional Director
Mountain-Prairie Region
U. S. Fish and Wildlife Service

On Sep 16, 2015, at 4:49 PM, Frazer, Gary <gary_frazer@fws.gov> wrote:

Thanks, Jodi. Update went well, but as expected. Jonathan Mawdsley noted that there were still more states that wanted to be engaged. Jeff Hagener noted that the states thought they should have a rep from within each of the 5(?) recovery units/areas. Jim Connolly from Maine came up afterwards to pass on (ok, complain) that they needed more information on the SSA process and how it would work, that we needed to share with the panelists all the information that we had in advance of the elicitation meeting, that they were unclear about next steps and concerned that they were hearing that the Service was going to have a closed door meeting following the elicitation. Wanted to know how the Service intended to keep the states involved throughout.

I pointed out that this was a transparent and inclusive science process, but not a representative democracy and that the Service needed to find the sweet spot between engaging all those that wanted a seat at the table and keeping the panel to a workable and productive size. Also noted that this is not a prescriptive process, that you're still sorting out the details, and that more information will no doubt be forthcoming. Assume that is all in alignment with what you are doing

So surprise -- you get no credit for including the states, only criticism for not doing to everyone's satisfaction. But you've been there before, looks like you're doing a fine job, and I'm sure this will turn into a positive. Thanks for your investment in bringing the states into something that is obviously of great interest to them. Let me know if you need me to help in any way. -- GDF

Gary Frazer
Assistant Director -- Ecological Services
U.S. Fish and Wildlife Service
(202) 208-4646

On Wed, Sep 16, 2015 at 2:16 PM, Jodi Bush <jodi_bush@fws.gov> wrote:
We are going to work thru SsA and the come up with a process for state involvement as we move forward with recovery plan. We will continue to have coordination calls and many of the state folks are likely to continue to be involved. In field today but happy to chat with you more about this. JB

Sent from my iPhone

On Sep 16, 2015, at 9:12 AM, Frazer, Gary <gary_frazer@fws.gov> wrote:

Jodi -- What are your plans,if any, for continued engagement of states in the recovery planning process? -- GDF

Gary Frazer
Assistant Director -- Ecological Services
U.S. Fish and Wildlife Service
(202) 208-4646

On Tue, Sep 15, 2015 at 5:18 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:
Hi Gary. Some updates.

I am also adding Noreen on this email as Seth suggested.

Updates to talking points below.

- The Service core team with input from our State partners has identified the expert panelists that will be part of the Lynx SSA. We will share this final list with our partners prior to our monthly call on September 30th.
- We believe, and in discussions with Jonathan Mawsdley of AFWA -he agrees, that we have good representation of State experts among our group of panelists. We considered expertise, range, geographic equity, redundancy and state interest in our identification of panelists.
- Besides the involvement of State experts on the panel, we also will have several State observers in attendance at the SSA workshop. These observers are expected to be liasons to the all states within the range of the lynx.

Please feel free to give me a call if you have questions. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Fri, Sep 11, 2015 at 2:24 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:
Hey Gary. Not much has changed since I sent these in July but here you go.

-
- The Service is working on a Lynx Recovery Plan in response to court ordered settlement using the Species Status Assessment process (SSA).
 - The SSA is a structured, transparent, and scientifically-robust status, threat, and

viability assessment that is intended to provide the scientific underpinnings for all determinations the Service is required to make in accordance with the Act.

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FYI. The SSA process should also meet our need to complete a five year review but we are no longer focusing on that. Feel free to give me a call if you have any questions -thanks. JB

Jodi L. Bush
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Montana Ecological Services Office
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From: [Matt Hogan](#)
To: [Noreen Walsh](#)
Subject: FW: thanks for your help on lynx!
Date: Monday, March 14, 2016 8:28:54 AM

Here is the last email I got from him after AFWA in September. He talks about 5 states being on the SSA panel. Doesn't seem consistent with what we are hearing. Have reached out to him again. Will share anything I learn.

From: Jonathan Mawdsley [mailto:jmawdsley@fishwildlife.org]
Sent: Friday, September 25, 2015 8:58 AM
To: Matt Hogan
Subject: RE: thanks for your help on lynx!

Yes – states have been informed that there will be 5 states on the SSA panel and reconsideration of the timetable for the SSA process in order to make sure we get the science right. Thanks again for your help!

From: Matt Hogan [mailto:Matt_Hogan@fws.gov]
Sent: Friday, September 25, 2015 10:54 AM
To: Jonathan Mawdsley
Subject: RE: thanks for your help on lynx!

Thanks for the follow up. Have things settled down?

From: Jonathan Mawdsley [mailto:jmawdsley@fishwildlife.org]
Sent: Friday, September 25, 2015 8:51 AM
To: Matt_hogan@fws.gov
Subject: re: thanks for your help on lynx!

Hello Matt,

Just a quick note to say thanks for the good conversation last week regarding the states' concerns about the Species Status Assessment process for Canada Lynx. We really appreciate your help in addressing these concerns!

With best regards,
Jonathan Mawdsley

Jonathan R. Mawdsley, Ph.D.
Fish and Wildlife Science Coordinator
Association of Fish and Wildlife Agencies
1100 First Street, NE, Suite 825
Washington, DC 20002 USA
Phone: (202) 838-3462
Cell: (202) 997-6628
Fax: (202) 350-9869
E-mail: jmawdsley@fishwildlife.org

Web: <http://www.fishwildlife.org>

From: [Matt Hogan](#)
To: [Jonathan Mawdsley](#)
Subject: RE: thanks for your help on lynx!
Date: Monday, March 14, 2016 8:28:07 AM

Jonathan,

Not sure if you got the VM I left you on Friday. Curious what you are hearing about lynx heading in to the North American. Thanks.

Matt

From: Jonathan Mawdsley [mailto:jmawdsley@fishwildlife.org]
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E-mail: jmawdsley@fishwildlife.org

Web: <http://www.fishwildlife.org>

From: [Matt Hogan](#)
To: [Noreen Walsh](#)
Subject: Fwd: thanks for your help on lynx!
Date: Tuesday, March 15, 2016 6:11:08 AM

Response from Jonathan. Hopefully correct assessment.

Begin forwarded message:

From: Jonathan Mawdsley <jmawdsley@fishwildlife.org>
Date: March 15, 2016 at 6:03:59 AM MDT
To: Matt Hogan <Matt_Hogan@fws.gov>
Subject: Re: thanks for your help on lynx!

Matt,

Many thanks for the note - apologies for the delayed response. Things have been fairly quiet on the lynx front. We had a good discussion about lynx conservation with the state wildlife diversity managers earlier this year and there were no new significant issues raised at that time. I understand that Jodi Bush will be here at the North American which should be helpful for states to be able to ask questions directly. Thanks for the call and for the note - much appreciated!

Best,

Jonathan

From: Matt Hogan <Matt_Hogan@fws.gov>
Sent: Monday, March 14, 2016 10:28 AM
To: Jonathan Mawdsley
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From: [Matt Hogan](#)
To: [Jonathan Mawdsley](#)
Cc: [Bush, Jodi](#); [Vore, John](#); [Jen Mock Schaeffer](#)
Subject: Re: lynx update at AFWA T&E Committee
Date: Thursday, March 17, 2016 11:53:21 AM

Thanks Jonathan. I'll be gone but not sure about Jodi.

On Mar 17, 2016, at 1:46 PM, Jonathan Mawdsley <jmawdsley@fishwildlife.org> wrote:

Dear Matt, Jodi, and John,

I trust this message finds you well! There is time on the agenda at tomorrow's AFWA Threatened and Endangered Species Policy Committee meeting for an update on Canada lynx conservation efforts. I was thinking that this would potentially be a great opportunity for Jodi to brief the committee on the progress on the SSA and also perhaps for John to provide a state perspective on lynx conservation efforts. Many thanks in advance for your consideration - I am cc-ing Jen Mock Schaeffer who will be staffing that committee meeting tomorrow.

All the best,

Jonathan Mawdsley

From: [Matt Hogan](#)
To: [Jodi Bush](#)
Subject: Re: lynx update at AFWA T&E Committee
Date: Friday, March 18, 2016 11:12:38 AM

How'd it go?

Matt Hogan
Deputy Regional Director
Mountain-Prairie Region
U.S. Fish & Wildlife Service
303-236-7920

On Mar 17, 2016, at 8:25 PM, Jodi Bush <jodi_bush@fws.gov> wrote:

Hi Jen. I believe our Gina Schultz (ccd here), from our agency will be covering this topic. I will be there tho and am happy to assist or answer questions. JB

Sent from my iPhone

On Mar 17, 2016, at 4:55 PM, Vore, John <jvore@mt.gov> wrote:

I'd be happy to put in a word or two if I can do so before 9:00 because I have to leave shortly after that to catch my plane.

John Vore
Game Management Bureau Chief
Montana Fish, Wildlife & Parks
1420 E. 6th Ave.
Helena, MT 59620
406-444-3940

From: Jonathan Mawdsley [<mailto:jmawdsley@fishwildlife.org>]
Sent: Thursday, March 17, 2016 11:46 AM
To: Matt Hogan; Bush, Jodi; Vore, John
Cc: Jen Mock Schaeffer
Subject: re: lynx update at AFWA T&E Committee

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All the best,
Jonathan Mawdsley

From: [Matt Hogan](#)
To: [Jodi Bush](#)
Cc: nicole_alt@fws.gov
Subject: Re: lynx update at AFWA T&E Committee
Date: Friday, March 18, 2016 11:29:29 AM

Good deal....thanks for covering. Maybe we need to give you a few more issues that you can also make easy peasy.

Matt Hogan
Deputy Regional Director
Mountain-Prairie Region
U.S. Fish & Wildlife Service
303-236-7920

On Mar 18, 2016, at 11:21 AM, Jodi Bush <jodi_bush@fws.gov> wrote:

Easy peasy. I did a 5 min update. They said thank you. I also chatted with the Maine State director at break with R5 ARD Phifer. He has issues but also said thank you so I think we are good. I spent time this week giving everyone I saw that had Lynx an update so mission accomplished. JB

Sent from my iPhone

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All the best,
Jonathan Mawdsley

From: [Matt Hogan](#)
To: [Noreen Walsh](#)
Subject: Fwd: lynx update at AFWA T&E Committee
Date: Friday, March 18, 2016 11:30:37 AM

FYI

Matt Hogan
Deputy Regional Director
Mountain-Prairie Region
U.S. Fish & Wildlife Service
303-236-7920

Begin forwarded message:

From: Jodi Bush <jodi_bush@fws.gov>
Date: March 18, 2016 at 11:21:05 AM MDT
To: Matt Hogan <matt_hogan@fws.gov>
Cc: nicole_alt@fws.gov
Subject: Re: lynx update at AFWA T&E Committee

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All the best,
Jonathan Mawdsley

From: [Matt Hogan](#)
To: [Noreen Walsh](#)
Subject: FW: Montana Congressional Delegation Announced \$2 Million for Whitefish Lake Watershed Project
Date: Thursday, September 15, 2016 11:51:41 AM

Wonder if you should share with JH?

From: Mogadam, Roya [mailto:roya_mogadam@fws.gov]
Sent: Thursday, September 15, 2016 11:49 AM
To: Noreen Walsh; Matt Hogan
Cc: Brian Salem; Anna Munoz; Serena Baker
Subject: Re: Montana Congressional Delegation Announced \$2 Million for Whitefish Lake Watershed Project

Here is the revised press release:

FOR IMMEDIATE RELEASE
September 15, 2016
Contact: Marcie Kinzel (Daines) 202-224-2651
Luke Jackson (Tester) 406-702-5848
Heather Swift (Zinke) 202-225-3211

Montana Congressional Delegation Announces \$2 Million for Whitefish Lake Watershed Project

U.S. CONGRESS — U.S. Senators Steve Daines and Jon Tester and U.S. Representative Ryan Zinke today announced \$2 million in funding for the Whitefish Lake Watershed Land and Water Conservation Fund (LWCF) Project.

The funding is made available through the U.S. Fish and Wildlife Service (FWS).

“It’s great news that we were able to secure additional funds to help protect Montana’s natural resources and preserve it for future generations,” Daines stated. **“The Whitefish Lake Watershed Project is another example of the critical role LWCF in conservation and recreation in our local communities.”**

“I am thrilled that Montana’s Congressional delegation was able to come together and secure these funds for the Whitefish Lake Watershed Project,” Tester said. **“Folks come from around the world to see the beauty of Whitefish Lake and thanks to LWCF and the Whitefish Lake Watershed Project this land will be preserved for future generations of sportsmen and women.”**

“This grant is proof of what’s possible when our delegation works together,” said Zinke. **“Growing up in Whitefish, I developed a special appreciation for both our land and water and the timber industry and how the two can complement each other. I’m happy to see this project succeed and will continue to be a fighter for the Land and Water Conservation Fund in Congress.”**

“Thank you to Senator Tester, Senator Daines, and Congressman Zinke for their continued support of conservation efforts in Montana. This \$2 million grant will help further the large scale, partnership-based conservation efforts being undertaken by the Montana Department of Natural Resources. The grant will help support Montana’s incredible natural heritage for future generations and contribute to conservation of Canada lynx, bull trout, grizzly bears and other federally-listed species.”said Noreen Walsh, Regional Director, Mountain-Prairie Region, U.S. Fish and Wildlife Service.

This conservation easement on this Weyerhaeuser property will greatly complement conservation efforts for the Montana Department of Natural Resources and Conservation Habitat Conservation Plan and efforts by the U.S. Forest Service Forest Legacy Program supported by the delegation. It will help protect habitat of iconic wildlife species while ensuring the property remains in timber production and provides public access for hunting, fishing, hiking, mountain biking, and other ways of outdoor recreation, all critical to the local economy.

On May 20, 2016 the delegation urged the FWS to prioritize the Whitefish Lake Watershed Project. The letter is available to download [HERE](#).

###

Contact: [Marcie Kinzel](#), [Katie Waldman](#), [Lindsey Singer](#)

On Thu, Sep 15, 2016 at 11:28 AM, Mogadam, Roya <roya_mogadam@fws.gov> wrote:
I will share with you all the revised press release that should be coming my way shortly. They had accidentally had the wrong name attributed to the quote.

On Thu, Sep 15, 2016 at 11:10 AM, Mogadam, Roya <roya_mogadam@fws.gov> wrote:
Morning Noreen and Matt-

Please see below for the final press release that will be sent at 12:00pm MT/2:00pm ET today from the Montana congressional delegation on the \$2 million grant for the Whitefish Lake Watershed Project.

-Roya

----- Forwarded message -----

From: **Kinzel, Marcie (Daines)** <Marcie_Kinzel@daines.senate.gov>

Date: Thu, Sep 15, 2016 at 11:06 AM

Subject: Montana Congressional Delegation Announced \$2 Million for Whitefish Lake Watershed Project

To: "roya_mogadam@fws.gov" <roya_mogadam@fws.gov>

Cc: "Banks, Marnee (Tester)" <Marnee_Banks@tester.senate.gov>, "heather.swift@mail.house.gov" <heather.swift@mail.house.gov>

Roya,

Hope you are well. Below you will find the release that we will plan to send at 2pm EST.

Thank you,

Marcie

FOR IMMEDIATE RELEASE
September 15, 2016

Contact: Marcie Kinzel (Daines) 202-224-2651
Luke Jackson (Tester) 406-702-5848
Heather Swift (Zinke) 202-225-3211

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“I am thrilled that Montana’s Congressional delegation was able to come together and secure these funds for the Whitefish Lake Watershed Project,” Tester said. **“Folks come from around the world to see the beauty of Whitefish Lake and thanks to LWCF and the Whitefish Lake Watershed Project this land will be preserved for future generations of sportsmen and women.”**

“This grant is proof of what’s possible when our delegation works together,” said Zinke. **“Growing up in Whitefish, I developed a special appreciation for both our land and water and the timber industry and how the two can complement each other. I’m happy to see this project succeed and will continue to be a fighter for the Land and Water Conservation Fund in Congress.”**

“Thank you to Senator Tester, Senator Daines, and Congressman Zinke for their continued support of conservation efforts in Montana. This \$2 million grant will help further the large scale, partnership-based conservation efforts being undertaken by the Montana Department of Natural Resources. The grant will help support Montana’s incredible natural heritage for future generations and contribute to conservation of Canada lynx, bull trout, grizzly bears and other federally-listed species.” said Roya Mogadam, Deputy Assistant Regional Director, External Affairs, Mountain-Prairie Region, U.S. Fish and Wildlife Service.

This conservation easement on this Weyerhaeuser property will greatly complement conservation efforts for the Montana Department of Natural Resources and Conservation Habitat Conservation Plan and efforts by the U.S. Forest Service Forest Legacy Program supported by the delegation. It will help protect habitat of iconic wildlife species while ensuring the property remains in timber production and provides public access for hunting, fishing, hiking, mountain biking, and other ways of outdoor recreation, all critical to the local economy.

On May 20, 2016 the delegation urged the FWS to prioritize the Whitefish Lake Watershed Project. The letter is available to download [HERE](#).

###

Contact: [Marcie Kinzel](#), [Katie Waldman](#), [Lindsey Singer](#)

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Roya Mogadam
Deputy Assistant Regional Director, External Affairs
Mountain-Prairie Region
U.S. Fish and Wildlife Service
134 Union Boulevard
Lakewood, CO 80228

Roya_Mogadam@fws.gov
(303) 236-4572

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(303) 236-4572

From: [Matt Hogan](#)
To: [Noreen Walsh](#)
Subject: RE: Montana Congressional Delegation Announced \$2 Million for Whitefish Lake Watershed Project
Date: Thursday, September 15, 2016 12:16:24 PM

You mean drafting it?

From: Noreen Walsh [mailto:noreen_walsh@fws.gov]
Sent: Thursday, September 15, 2016 11:53 AM
To: Matt Hogan
Subject: RE: Montana Congressional Delegation Announced \$2 Million for Whitefish Lake Watershed Project

How did the quote end up being from Roya?

*Noreen Walsh
Regional Director
Mountain-Prairie Region
U. S. Fish and Wildlife Service
303 236 7920*

From: Matt Hogan [mailto:Matt_Hogan@fws.gov]
Sent: Thursday, September 15, 2016 11:52 AM
To: Noreen Walsh
Subject: FW: Montana Congressional Delegation Announced \$2 Million for Whitefish Lake Watershed Project

Wonder if you should share with JH?

From: Mogadam, Roya [mailto:roya_mogadam@fws.gov]
Sent: Thursday, September 15, 2016 11:49 AM
To: Noreen Walsh; Matt Hogan
Cc: Brian Salem; Anna Munoz; Serena Baker
Subject: Re: Montana Congressional Delegation Announced \$2 Million for Whitefish Lake Watershed Project

Here is the revised press release:

FOR IMMEDIATE RELEASE
September 15, 2016
Contact: Marcie Kinzel (Daines) 202-224-2651
Luke Jackson (Tester) 406-702-5848
Heather Swift (Zinke) 202-225-3211

Montana Congressional Delegation Announces \$2 Million for Whitefish Lake Watershed Project

U.S. CONGRESS — U.S. Senators Steve Daines and Jon Tester and U.S. Representative Ryan Zinke today announced \$2 million in funding for the Whitefish Lake Watershed Land and Water Conservation Fund (LWCF) Project.

The funding is made available through the U.S. Fish and Wildlife Service (FWS).

“It’s great news that we were able to secure additional funds to help protect Montana’s natural resources and preserve it for future generations,” Daines stated. **“The Whitefish Lake Watershed Project is another example of the critical role LWCF in conservation and recreation in our local communities.”**

“I am thrilled that Montana’s Congressional delegation was able to come together and secure these funds for the Whitefish Lake Watershed Project,” Tester said. **“Folks come from around the world to see the beauty of Whitefish Lake and thanks to LWCF and the Whitefish Lake Watershed Project this land will be preserved for future generations of sportsmen and women.”**

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“Thank you to Senator Tester, Senator Daines, and Congressman Zinke for their continued support of conservation efforts in Montana. This \$2 million grant will help further the large scale, partnership-based conservation efforts being undertaken by the Montana Department of Natural Resources. The grant will help support Montana’s incredible natural heritage for future generations and contribute to conservation of Canada lynx, bull trout, grizzly bears and other federally-listed species.”said Noreen Walsh, Regional Director, Mountain-Prairie Region, U.S. Fish and Wildlife Service.

This conservation easement on this Weyerhaeuser property will greatly complement conservation efforts for the Montana Department of Natural Resources and Conservation Habitat Conservation Plan and efforts by the U.S. Forest Service Forest Legacy Program supported by the delegation. It will help protect habitat of iconic wildlife species while ensuring the property remains in timber production and provides public access for hunting, fishing, hiking, mountain biking, and other ways of outdoor recreation, all critical to the local economy.

On May 20, 2016 the delegation urged the FWS to prioritize the Whitefish Lake Watershed Project. The letter is available to download [HERE](#).

###

Contact: [Marcie Kinzel](#), [Katie Waldman](#), [Lindsey Singer](#)

On Thu, Sep 15, 2016 at 11:28 AM, Mogadam, Roya <roya_mogadam@fws.gov> wrote:
I will share with you all the revised press release that should be coming my way shortly. They had accidentally had the wrong name attributed to the quote.

On Thu, Sep 15, 2016 at 11:10 AM, Mogadam, Roya <roya_mogadam@fws.gov> wrote:
Morning Noreen and Matt-

Please see below for the final press release that will be sent at 12:00pm MT/2:00pm ET today from the Montana congressional delegation on the \$2 million grant for the Whitefish Lake Watershed Project.

-Roya

----- Forwarded message -----

From: **Kinzel, Marcie (Daines)** <Marcie_Kinzel@daines.senate.gov>

Date: Thu, Sep 15, 2016 at 11:06 AM

Subject: Montana Congressional Delegation Announced \$2 Million for Whitefish Lake Watershed Project

To: "roya_mogadam@fws.gov" <roya_mogadam@fws.gov>

Cc: "Banks, Marnee (Tester)" <Marnee_Banks@tester.senate.gov>, "heather.swift@mail.house.gov" <heather.swift@mail.house.gov>

Roya,

Hope you are well. Below you will find the release that we will plan to send at 2pm EST.

Thank you,

Marcie

FOR IMMEDIATE RELEASE

September 15, 2016

Contact: Marcie Kinzel (Daines) 202-224-2651

Luke Jackson (Tester) 406-702-5848

Heather Swift (Zinke) 202-225-3211

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“This grant is proof of what’s possible when our delegation works together,” said Zinke. **“Growing up in Whitefish, I developed a special appreciation for both our land and water and the timber industry and how the two can complement each other. I’m happy to see this project succeed and will continue to be a fighter for the Land and Water**

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Contact: [Marcie Kinzel](#), [Katie Waldman](#), [Lindsey Singer](#)

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Roya Mogadam
Deputy Assistant Regional Director, External Affairs
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From: [Matt Hogan](#)
To: [Michael Thabault](#)
Cc: [Strickland, Jennifer](#); [Anna Munoz](#); [Nicole Alt](#); [Jodi Bush](#); [Marjorie Nelson](#); [Noreen Walsh](#); [Roya Mogadam](#); [Robert Segin](#); [Michael D"agostino](#); [Kate Miyamoto](#)
Subject: Re: Lynx: media and engagement summary
Date: Thursday, January 11, 2018 6:47:21 PM

Thanks Jen. Nice summary. And kudos to all who were part of the rollout and all those who worked to help recover the lynx!

Sent from my iPhone

On Jan 11, 2018, at 5:24 PM, Michael Thabault <michael_thabault@fws.gov> wrote:

Great job everybody!!!!

Michael Thabault
Assistant Regional Director
Ecological Services
Mountain Prairie Region

On Jan 11, 2018, at 4:56 PM, Strickland, Jennifer <jennifer_strickland@fws.gov> wrote:

Hi everyone,

Today our press release was distributed to 415 reporters and saw an open rate of 14.5% (60 opens). The release has been viewed 924 times on our website so far. To compare, our regional homepage received 288 views today and the lynx species information page was viewed 308 times.

We responded to press inquiries from the AP (Matt Brown in Montana), Reuters (Laura Zuckerman in Pinedale), the Bozeman Daily Chronicle, the Lone Peak Lookout Reporter out of Big Sky, the Lewiston Tribune in Idaho, the NWF's Montana region, KELO Radio News in Sioux Falls, and did recorded interviews with Yellowstone Public Radio and Colorado Public Radio. Sarah Levy in R1 received a general inquiry from an NPR affiliate in Boise and the Spokesman-Review out of Spokane, and Meagan Racey in R5 had a few calls and did an interview with Maine NPR.

Questions received were mainly were along the lines of:

- Do you have a timeline for a proposed rule?
- Why was the species originally listed if you don't have population counts?
- What, if anything, will change for lynx once it's delisted? CPR asked if it could be hunted.

What was is the main reason you're proposing to delist?

Matt Brown also mentioned that he's looking at the climate change connection between wolverine and lynx. We didn't answer any specific questions on wolverine other than that there is no new news.

On the social media front, audience reactions range from enthusiastic to skeptical. Michael provided the attached screenshots of the Facebook post's performance, and the post has already reached 1,000 more people since the screenshot was taken. We did receive a comment from WildEarth Guardians but since the message is political in nature, there's nothing to be gained in responding.

Jodi Bush did an excellent job as our subject matter expert and had a lengthy conversation with the AP and also was interviewed by CPR. Thank you Jodi!

Thanks also to Kate for stepping in and posting a raft of materials on the site for us, to Michael for engaging our audiences on social, to Marj and Nicole for their help, to Meagan, Georgia and Sarah for handling media in the other regions, and of course to Steve, Roya and Anna for making and shepherding the outreach through the process!

- Jen

<Artboard 6.png>

--

Jennifer Strickland

Sagebrush Communications
U.S. Fish and Wildlife Service, Mountain-Prairie Region
(o) 303-236-4574
(c) 720-595-4815
<https://www.linkedin.com/in/jenmstrick/>

<lynx01.png>

<lynx02.png>

From: [Parkin, Mary](#)
To: [Zelenak, Jim](#)
Subject: Re: Updated lynx invitation
Date: Wednesday, May 27, 2015 11:40:49 AM

Sorry about that, Jim! I now realize that in cutting and pasting the list from your email, I missed you.

Will add,
Mary

On Wed, May 27, 2015 at 1:22 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Mary,

Very sorry to hear about your daughter. I hope all is OK.

I don't see the invite, and I just realized I may not be on your list - I can see the invite on Heather's, Brent's and your calendars, but not my own.

Only thing that could be changed (but doesn't NEED to be) is the Description begins with "This purpose...." and could say "The purpose....").

Otherwise it looks correct.

Thanks,

Jim

On Wed, May 27, 2015 at 10:58 AM, Parkin, Mary <mary_parkin@fws.gov> wrote:

Hi Jim,

I just sent an updated Google invite to everyone. It has your conference line number and the webinar info that Brent set up. Could you please take a look at the invite and let me know if I need to correct anything?

Oh, and I started going through the REV slides to pick out the 2-3 best, then got interrupted with news that my daughter spent night in the ER (in Boston) -- she's being tested for what might be a serious health issue, so I've been trying to see what's going on. It may take another hour or so before I've figured all that out, but I'll definitely send the slides in the next few hours.

Take care,
Mary

--

*Mary Parkin
Endangered Species Recovery Coordinator, Northeast Region
U.S. Fish and Wildlife Service, Hadley, MA
Remotely located in Escalante, Utah:
Mailing address PO Box 637, Escalante, UT 84726
Street address 145 North Center St, Escalante, UT 84726*

Phone 617-417-3331
Email mary_parkin@fws.gov

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

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Mary Parkin
Endangered Species Recovery Coordinator, Northeast Region
U.S. Fish and Wildlife Service, Hadley, MA
Remotely located in Escalante, Utah:
Mailing address PO Box 637, Escalante, UT 84726
Street address 145 North Center St, Escalante, UT 84726
Phone 617-417-3331
Email mary_parkin@fws.gov

From: [Jay Kolbe](#)
To: [Zelenak, Jim](#)
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Friday, September 11, 2015 11:19:21 PM

Jim-

Sorry it has taken me a few days to get back with you. Of course I'd be honored to participate.

I'll need to check internally on travel and will get back with you.

Jay Kolbe
FWP Wildlife Biologist
White Sulphur Springs, Region 4
(406) 499-2356

On Sep 11, 2015, at 1:50 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi Jay,

Need to know if you can attend the lynx SSA expert elicitation workshop at dates and place below. Hope so.

We hope to send out formal invitations next week. For state folks, we can help with travel expenses if that is an issue.

Let me know.

Jim

----- Forwarded message -----

From: **Zelenak, Jim** <jim_zelenak@fws.gov>
Date: Fri, Sep 4, 2015 at 3:47 PM
Subject: Canada Lynx Expert Elicitation Workshop
To:

Greetings!

You have been identified by your peers, the U.S Fish and Wildlife Service, and our State, Federal, and Academic partners as a candidate to participate in a structured expert elicitation workshop that is a crucial part of our Species Status Assessment for the contiguous United States Distinct Population Segment (DPS) of Canada lynx.

The objective of the workshop is to assess the current status of and threats to the various DPS populations and to evaluate the DPS's viability under a range of future threat, habitat condition, and climate scenarios.

The workshop will be held in Minneapolis, Minnesota on Oct. 13-15, 2015.

This is not a formal invitation to participate in the workshop; it is a request to let me know at your earliest convenience whether or not you would be able to attend the workshop on those dates. We hope to finalize the list of invitees and send out formal invitations in the next week or so.

In addition to lynx experts, we are assembling a list of candidates for workshop presentations on boreal forest ecology (distribution, insects, fires, and likely future condition), climate change/ modeling, and the regulatory environment as it pertains to lynx in the Lower 48 states and southern Canada. If you have recommendations for experts on those topics, please also provide them to me with your response.

Thanks for your consideration of and prompt reply to this request.

Cheers!

Jim

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
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Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

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Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Bush, Jodi](#)
To: [Zelenak, Jim](#)
Cc: [Kaimy Marks](#)
Subject: Re: Travel Minneapolis Oct 12-16
Date: Monday, September 14, 2015 9:21:07 AM

Kaimy. Please hold on this until we get a contract signed with hotel (hopefully today or tomorrow). But I will need the same arrangements. Thanks. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Mon, Sep 14, 2015 at 9:12 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Kaimy,

Could you help with me travel authorization for the lynx SSA Expert Elicitation Workshop next month?

I'll need to fly on Mon., 10/12 (holiday), hopefully arriving in Minneapolis about 1 PM or so to have time to set up the conference room, etc.

The workshop will end Thursday afternoon, but right now we are thinking that me and a few others will stay Thurs. night and Fri. morning to wrap things up after the experts leave. So I'll probably need to return flight leaving Minn. around 12-1 on Fri.

We'll have a block of rooms at the Crown Plaza and won't need rental cars

Let me know if you need other info.

Thanks!

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Catton, Timothy J.-FS](#)
To: [Nathan Hostetter](#); [Ryan, Daniel C.-FS](#); [Grosshuesch, David A.-FS](#); [Beth Gardner](#); [Catton, Susan J.-FS](#); [Tamara_Smith@fws.gov](#)
Subject: RE: Lynx Surveys
Date: Monday, September 14, 2015 11:08:18 AM

Pretty good timing. We have recently received the DNA results back from the bulk of our 2014-2015 samples, just waiting on a few re-extractions which should be coming this week. I can then update the database and distribute.

Tim

From: Nathan Hostetter [mailto:njhostet@ncsu.edu]
Sent: Monday, September 14, 2015 10:16 AM
To: Catton, Timothy J.-FS; Ryan, Daniel C.-FS; Grosshuesch, David A.-FS; Beth Gardner; Catton, Susan J.-FS; Tamara_Smith@fws.gov
Subject: Lynx Surveys

Hi All,

Let's get the group together to discuss last winter's lynx data, timeline for genetic results, and ideas for what next. A few afternoon time slots are on a doodle poll (times are ET). Let me know ASAP if you are unavailable next week so I can reschedule.

<http://doodle.com/poll/4hqkqpvnffr9cx5r>

Thanks!
-Nathan

Nathan J. Hostetter
Ph.D. student
NC State University
Department of Forestry and Environmental Resources
Campus Box 8001
Raleigh, NC 27695
P: 1-541-410-1453
njhostet@ncsu.edu

From: [Zelenak, Jim](#)
To: [Catton, Susan J -FS](#)
Cc: [Catton, Timothy J -FS](#); [Tamara Smith](#); [Jodi Bush](#)
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Monday, September 14, 2015 2:12:47 PM

Hi Susan and Tim,

I really appreciate that both of you are interested in and available to participate in the lynx expert elicitation workshop. However, because of the need to keep the group to a size appropriate for a structured elicitation process, we really need to limit the number of lynx experts we can formally invite. That, combined with the need to have some level of representation from each of the geographic regions of the DPS, also limits the number of folks we can have from any particular part of the range.

We are working on finalizing the list of experts to whom we will send formal invitations, which we hope to get out this week.

Jim

On Mon, Sep 14, 2015 at 1:51 PM, Catton, Susan J -FS <scatton@fs.fed.us> wrote:

Jim,

I wanted to let you know that I plan to attend and we are trying to schedule some child care so that Tim can attend also.

Looking forward to seeing you in a few weeks. -Susan

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Friday, September 04, 2015 4:48 PM
Subject: Canada Lynx Expert Elicitation Workshop

Greetings!

You have been identified by your peers, the U.S Fish and Wildlife Service, and our State, Federal, and Academic partners as a candidate to participate in a structured expert elicitation workshop that is a crucial part of our Species Status Assessment for the contiguous United States Distinct Population Segment (DPS) of Canada lynx.

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This is not a formal invitation to participate in the workshop; it is a request to let me know at your earliest convenience whether or not you would be able to attend the workshop on those dates. We hope to finalize the list of invitees and send out formal invitations in the next week or so.

In addition to lynx experts, we are assembling a list of candidates for workshop presentations on boreal forest ecology (distribution, insects, fires, and likely future condition), climate change/ modeling, and the regulatory environment as it pertains to lynx in the Lower 48 states and southern Canada. If you have recommendations for experts on those topics, please also provide them to me with your response.

Thanks for your consideration of and prompt reply to this request.

Cheers!

Jim

--

Jim Zelenak, Biologist

U.S. Fish and Wildlife Service

Montana Ecological Services Office

585 Shepard Way, Suite 1

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(406) 449-5225 ext. 220

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From: [Zelenak, Jim](#)
To: [Catton, Susan J -FS](#)
Cc: [Catton, Timothy J -FS](#); [Tamara Smith](#); [Jodi Bush](#)
Bcc: [Mary Parkin](#); [Heather Bell](#)
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Monday, September 14, 2015 2:12:43 PM

Hi Susan and Tim,

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Jim

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Jim Zelenak, Biologist

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(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Bell, Heather](#)
To: [Mary Parkin](#); [Jim Zelenak](#)
Subject: Fwd: new paper about spatial models and stressors for rare species
Date: Monday, September 14, 2015 3:08:56 PM

Isn't Josh Lawlor on our list of experts?

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
Lakewood, CO 80228
303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>

----- Forwarded message -----

From: **Darst, Cat** <cat_darst@fws.gov>
Date: Mon, Sep 14, 2015 at 10:17 AM
Subject: Re: new paper about spatial models and stressors for rare species
To: "Crouse, Debby" <debby_crouse@fws.gov>
Cc: Heather Bell <Heather_Bell@fws.gov>, Tara Nicolaysen <Tara_Nicolaysen@fws.gov>, Jennifer Szymanski <Jennifer_Szymanski@fws.gov>, Mary Parkin <Mary_Parkin@fws.gov>, Maile Neel <mneel@umd.edu>, Judy Che-Castaldo <jchecastaldo@sesync.org>

I haven't seen this paper, but it looks very interesting! Thank you for sharing. I've interacted a little bit with Josh Lawler...he's really good: <http://faculty.washington.edu/jlawler/>

Happy Monday,
Cat

On Mon, Sep 14, 2015 at 8:26 AM, Crouse, Debby <debby_crouse@fws.gov> wrote:
Are you folks familiar with this paper? I have not had time to read it. Abstract sounds interesting.

Debby

US Fish and Wildlife Service
Endangered Species Program
Branch of Recovery, Delisting and State Grants

Debby_Crouse@fws.gov
(p) 703-358-2471
(f) 703-358-1800

Note: new mailing address:
MS: ES
5275 LEESBURG PIKE
FALLS CHURCH, VA 22041-3803

----- Forwarded message -----

From: **McIntyre, Julie** <julie_mcintyre@fws.gov>

Date: Fri, Sep 11, 2015 at 8:19 PM

Subject: new paper about spatial models and stressors for rare species

To: Sarah Rinkevich <sarah_rinkevich@fws.gov>, Grant Harris <grant_harris@fws.gov>, Sarah Lehnen <sarah_lehnen@fws.gov>, Steven Sesnie <steven_sesnie@fws.gov>, Matthew Butler <matthew_butler@fws.gov>, Patricia Zenone <patricia_zenone@fws.gov>, Eric Hein <Eric_Hein@fws.gov>, Nathan Allan <Nathan_Allan@fws.gov>, Jennifer Smith-Castro <jennifer_smith-castro@fws.gov>, Brady McGee <brady_mcgee@fws.gov>, Marit Alanen <marit_alanen@fws.gov>, Erin Fernandez <erin_fernandez@fws.gov>, Debby Crouse <debby_crouse@fws.gov>

--

Julie McIntyre, Ph.D.

Ecologist - Endangered Species Recovery

Pollinator Coordinator/Monarch Lead, Southwest Region (R2)

US Fish & Wildlife Service

Ecological Services, Branch of Restoration & Recovery

Southwest Regional Office

P.O. Box 1306

500 Gold Avenue SW

Albuquerque, NM 87103-1306

Phone: 505.248.6507

Fax: 505.248.6788

Sharepoint - <https://fishnet.fws.doi.net/regions/2/eco/recovery/SitePages/Home.aspx>

--

Catherine R. Darst, Ph.D.

Assistant Field Supervisor: Listing & Recovery

[Ventura Fish and Wildlife Office](#)

2493 Portola Road Suite B

Ventura, CA 93003

(805) 644-1766 ext. 244

From: [McCollough, Mark](#)
To: [Jim Zelenak](#)
Subject: Johnson report?
Date: Tuesday, September 15, 2015 11:08:31 AM

I am not readily finding the Johnson report...can you please send? thanks, Mark

--

Mark McCollough, Ph.D.
Endangered Species Specialist
Maine Field Office
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17 Godfrey Drive, Suite 2
Orono, ME 04473
Phone 207 866-3344 x115
Cell Phone: 207 944-5709
mark_mccollough@fws.gov

From: [Ivan - DNR, Jake](#)
To: [Kurt Broderdorp](#)
Subject: Re: Lynx SSA expert elicitation meeting
Date: Tuesday, September 15, 2015 11:38:04 AM

I was not planning on that and probably shouldn't be the one to do it. I don't feel like I know much climate change science at all. We just finished the SWAP for Colorado, though, and it has an entire section on climate change. Maybe one of the people who did those analyses would be good? I believe CNHP did that, but you could check with Eric Odell to be sure.

Jake

Jake Ivan
Wildlife Researcher
Mammals Research Section



P 970.472.4310 | F 970.472.4457 | C 970.556.8048
317 W. Prospect Rd., Fort Collins, CO 80526
jake.ivan@state.co.us | cpw.state.co.us

On Tue, Sep 15, 2015 at 10:41 AM, Kurt Broderdorp <Kurt_Broderdorp@fws.gov> wrote:

Jake, I have been reviewing the presenters for Climate change ecology that are being considered for invitation. I noticed that there isn't anyone on the list to represent the S. Rockies climate change perspective. Are you planning on trying to cover some of that information for Colorado and the S. Rockies?

Kurt Broderdorp

US Fish and Wildlife Service

[\(970\) 628-7186](tel:(970)628-7186)

From: [Zelenak, Jim](#)
To: [Jodi Bush](#)
Subject: Fwd: Erin Simons
Date: Tuesday, September 15, 2015 12:35:45 PM

FYI

----- Forwarded message -----

From: **McCullough, Mark** <mark_mccollough@fws.gov>
Date: Tue, Sep 15, 2015 at 12:10 PM
Subject: Erin Simons
To: Jim Zelenak <jim_zelenak@fws.gov>

I believe we left the meeting today with Erin being invited to the meeting as a threats expert/advisor.

Threats and ecological processes in the Maine may be manifested differently than elsewhere in the DPS:

- significant changes in forest management and ownership
- climate change
- spruce budworm

Since graduating with her doctoral degree, Erin has become an expert in modeling all of these factors and others to understand how they affect wood supply, carbon sequestration and wildlife habitat. She has the added advantage of having the potential to project our latest lynx habitat model into the future with different forestry-climate change-budworm scenarios. I would think that to be a powerful tool for recovery planning.

I have never met Louis Iverson. He works in Ohio/PA, and I don't know of his expertise with boreal forest. I see from his website that much of his research is in the oak-hickory forest. Although he may have analyses to project changes in spruce-fir distributions, I'm not sure that he would have the perspective on how Maine forest management and budworm also affect the nature of our forest.

Just my two cents...

Mark

--

Mark McCollough, Ph.D.
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--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [McCollough, Mark](#)
To: [Jim Zelenak](#)
Subject: Erin Simons
Date: Tuesday, September 15, 2015 2:10:37 PM

I believe we left the meeting today with Erin being invited to the meeting as a threats expert/advisor.

Threats and ecological processes in the Maine may be manifested differently than elsewhere in the DPS:

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- climate change
- spruce budworm

Since graduating with her doctoral degree, Erin has become an expert in modeling all of these factors and others to understand how they affect wood supply, carbon sequestration and wildlife habitat. She has the added advantage of having the potential to project our latest lynx habitat model into the future with different forestry-climate change-budworm scenarios. I would think that to be a powerful tool for recovery planning.

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Just my two cents...

Mark

--

Mark McCollough, Ph.D.
Endangered Species Specialist
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Phone 207 866-3344 x115
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mark_mccollough@fws.gov

From: [Parkin, Mary](#)
To: [Bush, Jodi](#)
Cc: [Heather Bell](#); [Jim Zelenak](#)
Subject: Re: Example SSA agenda and invitation letters
Date: Tuesday, September 15, 2015 3:42:35 PM

Hi both,

I'm going to check my various mail boxes and sort this out right now. Will keep going until the items get to you.

Soon,
Mary

p.s. I think Heather has signed off for the day, but we have access to the same docs.

On Tue, Sep 15, 2015 at 5:20 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:

Hey ladies. Jim searched his inbox (and I checked mine too), we don't have messages from either of you with these 2 items. Could you resend? Looks like the email monster got em...Thanks. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

--

Mary Parkin
Endangered Species Recovery Coordinator, Northeast Region
U.S. Fish and Wildlife Service, Hadley, MA
Remotely located in Escalante, Utah:
Mailing address PO Box 637, Escalante, UT 84726
Street address 145 North Center St, Escalante, UT 84726
Phone 617-417-3331
Email mary_parkin@fws.gov

From: [Nathan Hostetter](#)
To: [Smith, Tamara](#)
Cc: [Catton, Timothy J -FS](#); [Ryan, Daniel C -FS](#); [Grosshuesch, David A -FS](#); [Beth Gardner](#); [Catton, Susan J -FS](#)
Subject: Re: Lynx Surveys
Date: Tuesday, September 15, 2015 4:47:29 PM

Hi Everyone,

First round didn't work, let's try the week of 28-Sep. All times are eastern.

<http://doodle.com/poll/asqwppw3a88hcn6>

Looking forward to hearing about the DNA results Tim! Thanks,
-Nathan

On Mon, Sep 14, 2015 at 5:07 PM, Smith, Tamara <tamara_smith@fws.gov> wrote:

Nathan,

Thank you for organizing this call!

Sorry - I'll be at a meeting all next week and can only make the call on Friday the 25th.

Thanks,
Tama

On Mon, Sep 14, 2015 at 11:07 AM, Catton, Timothy J -FS <tcatton@fs.fed.us> wrote:

Pretty good timing. We have recently received the DNA results back from the bulk of our 2014-2015 samples, just waiting on a few re-extractions which should be coming this week. I can then update the database and distribute.

Tim

From: Nathan Hostetter [mailto:njhostet@ncsu.edu]
Sent: Monday, September 14, 2015 10:16 AM
To: Catton, Timothy J -FS; Ryan, Daniel C -FS; Grosshuesch, David A -FS; Beth Gardner; Catton, Susan J -FS; Tamara_Smith@fws.gov
Subject: Lynx Surveys

Hi All,

Let's get the group together to discuss last winter's lynx data, timeline for genetic results, and ideas for what next. A few afternoon time slots are on a doodle poll (times are ET). Let me know ASAP if you are unavailable next week so I can reschedule.

<http://doodle.com/poll/4hqkqvnffr9cx5r>

Thanks!

-Nathan

Nathan J. Hostetter

Ph.D. student

NC State University

Department of Forestry and Environmental Resources

Campus Box 8001

Raleigh, NC 27695

P: [1-541-410-1453](tel:1-541-410-1453)

njhostet@ncsu.edu

--

Tamara Smith
U.S. Fish and Wildlife Service
Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425
[612-725-3548](tel:612-725-3548) ext. 2219
[612-600-1599](tel:612-600-1599) cell

From: [Bush, Jodi](#)
To: [Jim Zelenak](#)
Subject: Fwd: Lynx expert elicitation panel - Nichole Cudworth to attend for WY
Date: Wednesday, September 16, 2015 7:47:20 AM

FYI (I offered to cover Nichole's travel). JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

----- Forwarded message -----

From: **Bob Lanka** <bob.lanka@wyo.gov>
Date: Tue, Sep 15, 2015 at 5:36 PM
Subject: Lynx expert elicitation panel - Nichole Cudworth to attend for WY
To: "Bush, Jodi" <jodi_bush@fws.gov>
Cc: Zack Walker <zack.walker@wyo.gov>, Nichole Cudworth <nichole.cudworth@wyo.gov>, Scott Smith <Scott.Smith1@wyo.gov>

Jodi,

If the Service can pay for travel, Nichole Cudworth is very interested in attending from Wyoming. I appreciate the offer for Nichole to represent states as an observer to this process. Nichole will be the Department's representative during the recovery plan phase so it will be a real benefit for her to attend this phase of the overall process. Please contact Zack Walker and Nichole directly with all future correspondences and copy me if you can.

Thanks again Jodi. I will miss seeing you in Minneapolis in October. I will be going to Winnipeg, MB, Canada for the TWS Annual Conference in my role as Central Mountains and Plains Section Representative to Council. We should consider some type of joint session at an upcoming conference regarding states and the Service working together on species conservation and the ESA.

Take care and talk to you soon.
Bob

--

Bob Lanka, Certified Wildlife Biologist®
Statewide Wildlife and Habitat Management Supervisor
Central Mountains and Plains Section Representative to Council, The Wildlife Society
Wyoming Game and Fish Department
5400 Bishop Blvd.
Cheyenne, WY 82006
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307-777-4650 fax

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E-Mail to and from me, in connection with the transaction of public business, is subject to the Wyoming Public Records Act and may be disclosed to third parties.

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From: [Matt Hogan](#)
To: [Jodi Bush](#)
Cc: [Michael Thabault](#); [Noreen Walsh](#); [Richard Hannan](#)
Subject: Lynx SSA
Date: Wednesday, September 16, 2015 9:01:31 AM

Jodi,

Hope you are well. I understand you have been working hard to get the Lynx SSA team organized. Both Rich Hannan and I had states come up to us at AFWA last night and ask us to expand the team by two additional state folks so all 5 geographic areas with the range are represented. The two areas are the Pacific Northwest and Upper Midwest (MN I believe). I understand you have been working with Jonathan Mawdsley at AFWA on this. Can you reach out to him to find out who the additional two folks should be. Thanks very much.

Matt

Matt Hogan
Deputy Regional Director
Mountain-Prairie Region
U.S. Fish & Wildlife Service
303-236-7920

From: [Erin Simons-Legaard](mailto:erin.simons@maine.edu)
To: [McCollough, Mark](mailto:McCollough.Mark)
Subject: Re: Preview of lynx modeling?
Date: Wednesday, September 16, 2015 9:14:01 AM

Sometime in the AM on 9/28 would be better than 10/1. 10?

Do you happen to know when official invitations are going to go out?

Erin Simons-Legaard
Research Assistant Professor
School of Forest Resources
5755 Nutting Hall
University of Maine
Orono, ME 04469-5755
erin.simons@maine.edu

On Wed, Sep 16, 2015 at 8:57 AM, McCollough, Mark <mark_mccollough@fws.gov> wrote:
I will be on vacation on 9/25. Any time on 9/28 or Oct. 1?

thanks, Mark

On Tue, Sep 15, 2015 at 4:35 PM, Erin Simons-Legaard <erin.simons@maine.edu> wrote:
Hi Mark,

This week is not good. First field labs are happening and increased the level of crazy. How about in the AM sometime on Friday 9/25?

Erin

Erin Simons-Legaard
Research Assistant Professor
School of Forest Resources
5755 Nutting Hall
University of Maine
Orono, ME 04469-5755
erin.simons@maine.edu

On Tue, Sep 15, 2015 at 2:16 PM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Erin:

Is there a chance to preview your results for advancing lynx modeling? I know you are busy teaching. I am available tomorrow (Wednesday) and Thursday, Monday (28th).

Do any of those work for you?

thanks, Mark

--

Mark McCollough, Ph.D.
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Phone [207 866-3344 x115](tel:207-866-3344)
Cell Phone: [207 944-5709](tel:207-944-5709)
mark_mccollough@fws.gov

--

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Phone [207 866-3344 x115](tel:207-866-3344)
Cell Phone: [207 944-5709](tel:207-944-5709)
mark_mccollough@fws.gov

From: [McCollough, Mark](#)
To: [Jim Zelenak](#)
Subject: talked to Erin Simons
Date: Wednesday, September 16, 2015 10:50:40 AM

Jim:

I know you are busy with legal issues, as we are here. I just finished yet another FOIA this morning.

I had a chance to talk with Erin this morning to discuss what she could bring to the meeting related to threats to lynx and their habitat. She and graduate students she has been advising have been modeling Maine's forest to evaluate how climate change, budworm, and forest management will affect age, composition and structure of the Maine forest. She is in December to present at a USForest Service climate change symposium as a Maine expert on climate change and how it will affect Maine's forest.

We talked about Iverson's work. Erin is very aware of the work and has used his models and other models extensively in her work, but she has stepped down the spruce-fir projections to Maine and eastern Canada. She indicated that Iverson's spruce-fir models stop at the Maine border, whereas UMaine forest modeling has projected into eastern Canada - north and south of the St. Lawrence. I would think this would be of great interest to our expert meeting.

Finally, Erin has just completed modeling projections of future lynx distribution in Maine under different forest management scenarios. Forest management will have the greatest influence on lynx in Maine in the next 50 years and again, I think this information will be of great interest to the group.

I guess I am asking that you and Jody please consider Erin as a "threats expert" who can really help us understand forestry, climate, and budworm in our Maine/eastern Canadian forest.

Thanks, Mark

--

Mark McCollough, Ph.D.
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Phone 207 866-3344 x115
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mark_mccollough@fws.gov

From: [Jodi Bush](#)
To: [Matt Hogan](#)
Cc: [Michael Thabault](#); [Noreen Walsh](#); [Richard Hannan](#)
Subject: Re: Lynx SSA
Date: Wednesday, September 16, 2015 12:13:22 PM

Hi Matt. I'm in billings today but would be happy to chat with about this when I get a minute this afternoon. I think we do have coverage of all of these areas. I can clue you in more later but until then please see the talking points I have shared with Noreen and Gary (who asked for them). Next email. Thanks. JB

Sent from my iPhone

> On Sep 16, 2015, at 9:01 AM, Matt Hogan <matt_hogan@fws.gov> wrote:
>
> Jodi,
> Hope you are well. I understand you have been working hard to get the
> Lynx SSA team organized. Both Rich Hannan and I had states come up to
> us at AFWA last night and ask us to expand the team by two additional
> state folks so all 5 geographic areas with the range are represented.
> The two areas are the Pacific Northwest and Upper Midwest (MN I
> believe). I understand you have been working with Jonathan Mawdsley
> at AFWA on this. Can you reach out to him to find out who the
> additional two folks should be. Thanks very much.
>
> Matt
>
> Matt Hogan
> Deputy Regional Director
> Mountain-Prairie Region
> U.S. Fish & Wildlife Service
> 303-236-7920

From: [Jodi Bush](#)
To: [Matt Hogan](#); [Richard Hannan](#)
Cc: [Michael Thabault](#)
Subject: Fwd: talking points for Lynx SSA and Recovery planning
Date: Wednesday, September 16, 2015 12:13:56 PM

Sent from my iPhone

Begin forwarded message:

From: "Bush, Jodi" <jodi_bush@fws.gov>
Date: September 15, 2015 at 3:18:29 PM MDT
To: Gary Frazer <gary_frazer@fws.gov>, Noreen Walsh <noreen_walsh@fws.gov>
Cc: Jim Zelenak <jim_zelenak@fws.gov>, Seth Willey <seth_willey@fws.gov>, Nicole Alt <nicole_alt@fws.gov>
Subject: Re: talking points for Lynx SSA and Recovery planning

Hi Gary. Some updates.

I am also adding Noreen on this email as Seth suggested.

Updates to talking points below.

- The Service core team with input from our State partners has identified the expert panelists that will be part of the Lynx SSA. We will share this final list with our partners prior to our monthly call on September 30th.
- We believe, and in discussions with Jonathan Mawsdley of AFWA -he agrees, that we have good representation of State experts among our group of panelists. We considered expertise, range, geographic equity, redundancy and state interest in our identification of panelists.
- Besides the involvement of State experts on the panel, we also will have several State observers in attendance at the SSA workshop. These observers are expected to be liasons to the all states within the range of the lynx.

Please feel free to give me a call if you have questions. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Fri, Sep 11, 2015 at 2:24 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:
Hey Gary. Not much has changed since I sent these in July but here you go.

- The Service is working on a Lynx Recovery Plan in response to court ordered settlement using the Species Status Assessment process (SSA).
- The SSA is a structured, transparent, and scientifically-robust status, threat, and viability assessment that is intended to provide the scientific underpinnings for all determinations the Service is required to make in accordance with the Act.

- Since July of this year, the Service has been coordinating with States and other partners and seeking input from objective, independent experts in lynx ecology, habitat, management, and climate modeling to assess the current status and likely future viability of lynx populations within the DPS.
- We have been holding monthly calls with State wildlife management agencies within the range of the Lynx DPS to provide updates on our SSA progress.
- We have also requested and received input from the States on candidates to participate in an expert elicitation workshop that will be held. This workshop is scheduled for mid-October in Minnesota.
- The Service will continue to seek input at appropriate times during the process regarding the biological status of, and potential threats to, lynx populations within the DPS.
- The State coordination calls happen the last Wednesday of every month (starting July 29) at 1pm, MTN time. We have 15 states involved with some level of representation.
- We are working closely with Jonathan Mawdsley at AFWA to make sure we are as inclusive as possible while not undermining the SSA process.
- To ensure that our assessment will be as accurate and complete as possible, we will use the best scientific and commercial data available in the development of the SSA report.
- We hope to complete the SSA report by December of 2015 and then begin the recovery planning process.
- The Service intends to complete a recovery plan for the lynx DPS by January 15, 2018 in order to meet the court-ordered deadline.
- We continue to welcome any scientific information (e.g., survey results, habitat assessments, modeling efforts, implementation and/or monitoring of conservation measures, verified observations) you wish to provide for our consideration regarding the status, distribution, and likely future condition of lynx and snowshoe hare (*Lepus americanus*) populations and habitats.
- We appreciate the States interest and involvement in Lynx recovery and look forward to continued collaboration throughout this process.

FYI. The SSA process should also meet our need to complete a five year review but we are no longer focusing on that. Feel free to give me a call if you have any questions -thanks. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

From: [McCollough, Mark](#)
To: [Jim Zelenak](#)
Subject: talked to Erin Simons
Date: Wednesday, September 16, 2015 12:50:38 PM

Jim:

I know you are busy with legal issues, as we are here. I just finished yet another FOIA this morning.

I had a chance to talk with Erin this morning to discuss what she could bring to the meeting related to threats to lynx and their habitat. She and graduate students she has been advising have been modeling Maine's forest to evaluate how climate change, budworm, and forest management will affect age, composition and structure of the Maine forest. She is in December to present at a USForest Service climate change symposium as a Maine expert on climate change and how it will affect Maine's forest.

We talked about Iverson's work. Erin is very aware of the work and has used his models and other models extensively in her work, but she has stepped down the spruce-fir projections to Maine and eastern Canada. She indicated that Iverson's spruce-fir models stop at the Maine border, whereas UMaine forest modeling has projected into eastern Canada - north and south of the St. Lawrence. I would think this would be of great interest to our expert meeting.

Finally, Erin has just completed modeling projections of future lynx distribution in Maine under different forest management scenarios. Forest management will have the greatest influence on lynx in Maine in the next 50 years and again, I think this information will be of great interest to the group.

I guess I am asking that you and Jody please consider Erin as a "threats expert" who can really help us understand forestry, climate, and budworm in our Maine/eastern Canadian forest.

Thanks, Mark

--

Mark McCollough, Ph.D.
Endangered Species Specialist
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Phone 207 866-3344 x115
Cell Phone: 207 944-5709
mark_mccollough@fws.gov

From: [Daniel Harrison](#)
To: [Zelenak, Jim](#)
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Wednesday, September 16, 2015 3:50:52 PM

Hi Jim,

Sorry for the delay in responding as I was off e-mail while traveling to Syracuse to deal with a family emergency. Yes, I have discussed your invitation to participate with Mark McCollough and plan to attend the workshop. Mark has also touched based with me about a potential workshop presentation and I will be working with him on that over the next couple of weeks.

I look forward to receiving more details and will make plane reservations as soon as I get confirmation regarding agenda and process.

I look forward to the workshop.

Cheers- Dan

On Fri, Sep 4, 2015 at 5:47 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Greetings!

You have been identified by your peers, the U.S Fish and Wildlife Service, and our State, Federal, and Academic partners as a candidate to participate in a structured expert elicitation workshop that is a crucial part of our Species Status Assessment for the contiguous United States Distinct Population Segment (DPS) of Canada lynx.

The objective of the workshop is to assess the current status of and threats to the various DPS populations and to evaluate the DPS's viability under a range of future threat, habitat condition, and climate scenarios.

The workshop will be held in Minneapolis, Minnesota on Oct. 13-15, 2015.

This is not a formal invitation to participate in the workshop; it is a request to let me know at your earliest convenience whether or not you would be able to attend the workshop on those dates. We hope to finalize the list of invitees and send out formal invitations in the next week or so.

In addition to lynx experts, we are assembling a list of candidates for workshop presentations on boreal forest ecology (distribution, insects, fires, and likely future condition), climate change/ modeling, and the regulatory environment as it pertains to lynx in the Lower 48 states and southern Canada. If you have recommendations for experts on those topics, please also provide them to me with your response.

Thanks for your consideration of and prompt reply to this request.

Cheers!

Jim

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601

[| \(406\) 449-5225 ext. 220](tel:(406)449-5225)
[| jim_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

--

Daniel J. Harrison
Professor of Wildlife Ecology
Cooperating Professor of Sustainable Forestry
5755 Nutting Hall, Room 210
The University of Maine
Orono, ME 04469-5755
(207) 581-2867

From: [Daniel Harrison](#)
To: [McCollough, Mark](#)
Subject: Re: Lynx expert meeting MN
Date: Wednesday, September 16, 2015 5:56:59 PM

Hi Mark,

yes I was late responding to Jim as I had to make an emergency trip to Syracuse as my dad fell, broke his hip, and needed a full hip replacement, and was on the cusp for several days. He is now stabilized and was moved to a rehab center before I left...my mom and Joyce's mom also had falls while i was there....

Here is the response that I sent to Jim Zelenak:

Hi Jim,

Sorry for the delay in responding as I was off e-mail while traveling to Syracuse to deal with a family emergency. Yes, I have discussed your invitation to participate with Mark McCollough and plan to attend the workshop. Mark has also touched based with me about a potential workshop presentation and I will be working with him on that over the next couple of weeks.

I look forward to receiving more details and will make plane reservations as soon as I get confirmation regarding agenda and process.

I look forward to the workshop.

Cheers- Dan

Will be in touch about the presentation over the next couple of weeks after I get on top of things at the office.

Dan

On Fri, Sep 11, 2015 at 11:23 AM, McCollough, Mark <mark_mccollough@fws.gov> wrote:
Dan: I believe Jim Zelenak from USFWS may have recently contacted you to confirm your attendance at the MN meeting. If so, could you please respond to Jim? Jen and Erin have confirmed.

We are working on an outline for the presentations on the state overviews. I'd be glad to work with you on this and would be glad to meet with you to discuss.

Hope you got your painting done at camp. It was a beautiful weekend!

Mark

--

Mark McCollough, Ph.D.
Endangered Species Specialist
Maine Field Office
U. S. Fish and Wildlife Service
17 Godfrey Drive, Suite 2
Orono, ME 04473

Phone [207 866-3344 x115](tel:207-866-3344)
Cell Phone: [207 944-5709](tel:207-944-5709)
mark_mccollough@fws.gov

--

Daniel J. Harrison
Professor of Wildlife Ecology
Cooperating Professor of Sustainable Forestry
5755 Nutting Hall, Room 210
The University of Maine
Orono, ME 04469-5755
(207) 581-2867

From: [Beth Gardner](#)
To: [Smith, Tamara](#)
Subject: Re: Lynx Surveys
Date: Thursday, September 17, 2015 5:28:46 AM

Hi Tam, I am en route to Idaho. Took me a few to figure out the time zone...but it looks like I am busy when you are free! Bummer. Let me know when you have time to chat next week or the one after. It's no rush, just wanted to tell you about my move to Seattle and the technical stuff about the grant ;)

Ok, take off on the plane time!

Cheers,
Beth

On Sep 16, 2015 3:53 PM, "Smith, Tamara" <tamara_smith@fws.gov> wrote:

Hey Beth - Tomorrow afternoon may work - I'm free from 2- 4pm CT. Busy week! Hope all is well!

On Wed, Sep 16, 2015 at 12:27 PM, Beth Gardner <bagardne@ncsu.edu> wrote:

Hey Tam,

Do you have time to talk for a few minutes sometime later today or maybe tomorrow?

Cheers,
Beth

On Mon, Sep 14, 2015 at 5:07 PM, Smith, Tamara <tamara_smith@fws.gov> wrote:

Nathan,

Thank you for organizing this call!

Sorry - I'll be at a meeting all next week and can only make the call on Friday the 25th.

Thanks,
Tama

On Mon, Sep 14, 2015 at 11:07 AM, Catton, Timothy J -FS <tcatton@fs.fed.us> wrote:

Pretty good timing. We have recently received the DNA results back from the bulk of our 2014-2015 samples, just waiting on a few re-extractions which should be coming this week. I can then update the database and distribute.

Tim

From: Nathan Hostetter [mailto:njhostet@ncsu.edu]

Sent: Monday, September 14, 2015 10:16 AM

To: Catton, Timothy J -FS; Ryan, Daniel C -FS; Grosshuesch, David A -FS; Beth Gardner; Catton, Susan J -FS; Tamara_Smith@fws.gov

Subject: Lynx Surveys

Hi All,

Let's get the group together to discuss last winter's lynx data, timeline for genetic results, and ideas for what next. A few afternoon time slots are on a doodle poll (times are ET). Let me know ASAP if you are unavailable next week so I can reschedule.

<http://doodle.com/poll/4hqkqpvnfr9cx5r>

Thanks!

-Nathan

Nathan J. Hostetter

Ph.D. student

NC State University

Department of Forestry and Environmental Resources

Campus Box 8001

Raleigh, NC 27695

P: [1-541-410-1453](tel:1-541-410-1453)

njhostet@ncsu.edu

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Beth Gardner
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5217 Jordan Hall
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--

Tamara Smith
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Bloomington, MN 55425
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[612-600-1599](tel:612-600-1599) cell

From: [Bush, Jodi](#)
To: [Bob Lanka](#)
Cc: [Zack Walker](#); [Nichole Cudworth](#); [Scott Smith](#)
Subject: Re: Lynx expert elicitation panel - Nichole Cudworth to attend for WY
Date: Thursday, September 17, 2015 10:53:51 AM

Thanks Bob. As I indicated on my phone call to you, we can cover Nichole's travel. I will work directly with Zach and Nichole as we go forward. Thanks for your help. JB

I really like the idea of a joint session about that topic. Lets chat about that more sometime

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Tue, Sep 15, 2015 at 5:36 PM, Bob Lanka <bob.lanka@wyo.gov> wrote:

Jodi,

If the Service can pay for travel, Nichole Cudworth is very interested in attending from Wyoming. I appreciate the offer for Nichole to represent states as an observer to this process. Nichole will be the Department's representative during the recovery plan phase so it will be a real benefit for her to attend this phase of the overall process. Please contact Zack Walker and Nichole directly with all future correspondences and copy me if you can.

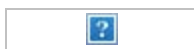
Thanks again Jodi. I will miss seeing you in Minneapolis in October. I will be going to Winnipeg, MB, Canada for the TWS Annual Conference in my role as Central Mountains and Plains Section Representative to Council. We should consider some type of joint session at an upcoming conference regarding states and the Service working together on species conservation and the ESA.

Take care and talk to you soon.

Bob

--

Bob Lanka, Certified Wildlife Biologist®
Statewide Wildlife and Habitat Management Supervisor
Central Mountains and Plains Section Representative to Council, The Wildlife Society
Wyoming Game and Fish Department
5400 Bishop Blvd.
Cheyenne, WY 82006
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From: [Zack Walker](#)
To: [Bush, Jodi](#)
Subject: Re: Lynx expert elicitation meeting
Date: Thursday, September 17, 2015 11:07:53 AM

Jodi,

Thanks for the information. I will pass this up the chain for permission, and I will let Nichole know to expect a letter soon. Thanks again for all of the help!

Zack

On Thu, Sep 17, 2015 at 10:57 AM, Bush, Jodi <jodi_bush@fws.gov> wrote:

Hi Zach. Typically we pay for airfare upfront and then reimburse the traveler for hotel and per diem. The hotel has a shuttle so a rental car will not be needed. We will send Nichole a letter here soon (today or tomorrow -I hope), that explains the process and gives her the hotel information.

Let me know if you have any further questions. Thanks. JB

Jodi L. Bush
Field Supervisor
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585 Shepard Way, Suite 1
Helena, MT 59601
 [\(406\) 449-5225, ext.205](tel:(406)449-5225)

On Wed, Sep 16, 2015 at 11:18 AM, Zack Walker <zack.walker@wyo.gov> wrote:

Jodi,

I have been in contact with Bob Lanka about sending Nichole Bjornlie (Cudworth) to the lynx meeting in Minneapolis. He had mentioned the USFWS might be willing to pay for this travel. I am trying to get permission for Nichole to attend this meeting from WGFD administration and was curious how travel costs may be covered. Would this be a reimbursement? Or would costs be handled in a different fashion? Thanks for all of the help and information! It is greatly appreciated.

Zack

--

Zack Walker
Certified Wildlife Biologist®
Statewide Nongame Bird and Mammal Program Supervisor
Wyoming Game and Fish
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Lander, WY 82520
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Zack.Walker@wyo.gov

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From: [Zelenak, Jim](#)
To: [Hodges, Karen](#)
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Thursday, September 17, 2015 12:17:05 PM

Hi Karen,

We've been without internet/email all morning.

We hope to send out formal invitations later today or tomorrow with hotel info, etc. We will be sending one to you requesting your participation in the workshop.

The workshop will begin at 1 PM on Tues. Oct. 13 and wrap up about 5 PM on Thurs. the 15th.

I've been scrambling on critical habitat lawsuit responses and so have had some trouble keeping these other ducks in a row, but hope to thru this part of it soon.

Jim

On Thu, Sep 17, 2015 at 7:57 AM, Hodges, Karen <karen.hodges@ubc.ca> wrote:

Hi Jim--

I've heard nothing further since this email of yours. . . I am wondering if I should have gotten a further email? It comes close to the time I should be booking flights if I am in fact to attend. Please advise?

Thanks,
Karen

Dr. Karen E. Hodges
Associate Professor
Department of Biology
University of British Columbia Okanagan
Science Building, 1177 Research Road
Kelowna, BC V1V 1V7

<http://biol.ok.ubc.ca/faculty/hodges.html>

From: Zelenak, Jim [jjim_zelenak@fws.gov]
Sent: September-04-15 2:47 PM
Subject: Canada Lynx Expert Elicitation Workshop

Greetings!

You have been identified by your peers, the U.S Fish and Wildlife Service, and our State, Federal, and Academic partners as a candidate to participate in a structured expert elicitation workshop that is a crucial part of our Species Status Assessment for the contiguous United States Distinct Population Segment (DPS) of Canada lynx.

The objective of the workshop is to assess the current status of and threats to the various DPS populations and to evaluate the DPS's viability under a range of future threat, habitat condition, and climate scenarios.

The workshop will be held in Minneapolis, Minnesota on Oct. 13-15, 2015.

This is not a formal invitation to participate in the workshop; it is a request to let me know at your earliest convenience whether or not you would be able to attend the workshop on those dates. We hope to finalize the list of invitees and send out formal invitations in the next week or so.

In addition to lynx experts, we are assembling a list of candidates for workshop presentations on boreal forest ecology (distribution, insects, fires, and likely future condition), climate change/ modeling, and the regulatory environment as it pertains to lynx in the Lower 48 states and southern Canada. If you have recommendations for experts on those topics, please also provide them to me with your response.

Thanks for your consideration of and prompt reply to this request.

Cheers!

Jim

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
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(406) 449-5225 ext. 220
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--

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jim_zelenak@fws.gov

From: [Matt Hogan](#)
To: [Michael Thabault](#); [Noreen Walsh](#)
Cc: [Gary Frazer](#); [Jodi Bush](#)
Subject: RE: talking points for Lynx SSA and Recovery planning
Date: Thursday, September 17, 2015 3:27:17 PM

I think this all developed rather quickly and therefore they took advantage of talking to the Service folks there. I believe Jonathan thought all was good until AFWA.

That said, there are two concerns: 1) state participation and 2) timeframe. On the first one, Noreen and my general hope is that we can accommodate the states on participation. As the only other entity with mgt authority, it seems like we would want the buy in from states across the range. As to timeframe, having something done by the EOY does sound pretty ambitious and would ask that you work with the states to try to come to a mutually agreed upon resolution.

If either you (Mike) or Jodi could call Jonathan to resolve, that would be great. His number is 202-997-6628. Thanks.

From: Thabault, Michael [mailto:michael_thabault@fws.gov]
Sent: Thursday, September 17, 2015 3:20 PM
To: Noreen Walsh
Cc: Frazer, Gary; Jodi Bush; Matt Hogan
Subject: Re: talking points for Lynx SSA and Recovery planning

Just to add to the fray as I expressed to Matt today, if the states have issues then rather than letting things fester pick up the phone and call somebody. If Johnathon was having issues or was aware of particular state angst, he knows who I am. Please have him contact me so we can work it out. Sorry for the whine.

Michael Thabault
Assistant Regional Director
Ecological Services
U.S. Fish and Wildlife Service
Mountain Prairie Region
303-236-4210
michael_thabault@fws.gov

On Wed, Sep 16, 2015 at 4:53 PM, Noreen Walsh <noreen_walsh@fws.gov> wrote:
Thanks for the update Gary and Jodi for all the work on this process!
Looping in Matt who has been also working with the states on including representation from 5 areas.

Noreen Walsh
Regional Director
Mountain-Prairie Region
U. S. Fish and Wildlife Service

On Sep 16, 2015, at 4:49 PM, Frazer, Gary <gary_frazer@fws.gov> wrote:

Thanks, Jodi. Update went well, but as expected. Jonathan Mawdsley noted that there were still more states that wanted to be engaged. Jeff Hagener noted that the states thought they should have a rep from within each of the 5(?) recovery units/areas. Jim Connolly from Maine came up afterwards to pass on (ok, complain) that they needed more information on the SSA process and how it would work, that we needed to share with the panelists all the information that we had in advance of the elicitation meeting, that they were unclear about next steps and concerned that they were hearing that the Service was going to have a closed door meeting following the elicitation. Wanted to know how the Service intended to keep the states involved throughout.

I pointed out that this was a transparent and inclusive science process, but not a representative democracy and that the Service needed to find the sweet spot between engaging all those that wanted a seat at the table and keeping the panel to a workable and productive size. Also noted that this is not a prescriptive process, that you're still sorting out the details, and that more information will no doubt be forthcoming. Assume that is all in alignment with what you are doing

So surprise -- you get no credit for including the states, only criticism for not doing to everyone's satisfaction. But you've been there before, looks like you're doing a fine job, and I'm sure this will turn into a positive. Thanks for your investment in bringing the states into something that is obviously of great interest to them. Let me know if you need me to help in any way. -- GDF

Gary Frazer
Assistant Director -- Ecological Services
U.S. Fish and Wildlife Service
(202) 208-4646

On Wed, Sep 16, 2015 at 2:16 PM, Jodi Bush <jodi_bush@fws.gov> wrote:
We are going to work thru SsA and the come up with a process for state involvement as we move forward with recovery plan. We will continue to have coordination calls and many of the state folks are likely to continue to be involved. In field today but happy to chat with you more about this. JB

Sent from my iPhone

On Sep 16, 2015, at 9:12 AM, Frazer, Gary <gary_frazer@fws.gov> wrote:

Jodi -- What are your plans,if any, for continued engagement of states in the recovery planning process? -- GDF

Gary Frazer
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(202) 208-4646

On Tue, Sep 15, 2015 at 5:18 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:
Hi Gary. Some updates.

I am also adding Noreen on this email as Seth suggested.

Updates to talking points below.

- The Service core team with input from our State partners has identified the expert panelists that will be part of the Lynx SSA. We will share this final list with our partners prior to our monthly call on September 30th.
- We believe, and in discussions with Jonathan Mawsdley of AFWA -he agrees, that we have good representation of State experts among our group of panelists. We considered expertise, range, geographic equity, redundancy and state interest in our identification of panelists.
- Besides the involvement of State experts on the panel, we also will have several State observers in attendance at the SSA workshop. These observers are expected to be liasons to the all states within the range of the lynx.

Please feel free to give me a call if you have questions. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Fri, Sep 11, 2015 at 2:24 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:
Hey Gary. Not much has changed since I sent these in July but here you go.

-
- The Service is working on a Lynx Recovery Plan in response to court ordered settlement using the Species Status Assessment process (SSA).
 - The SSA is a structured, transparent, and scientifically-robust status, threat, and

viability assessment that is intended to provide the scientific underpinnings for all determinations the Service is required to make in accordance with the Act.

- Since July of this year, the Service has been coordinating with States and other partners and seeking input from objective, independent experts in lynx ecology, habitat, management, and climate modeling to assess the current status and likely future viability of lynx populations within the DPS.
- We have been holding monthly calls with State wildlife management agencies within the range of the Lynx DPS to provide updates on our SSA progress.
- We have also requested and received input from the States on candidates to participate in an expert elicitation workshop that will be held. This workshop is scheduled for mid-October in Minnesota.
- The Service will continue to seek input at appropriate times during the process regarding the biological status of, and potential threats to, lynx populations within the DPS.
- The State coordination calls happen the last Wednesday of every month (starting July 29) at 1pm, MTN time. We have 15 states involved with some level of representation.
- We are working closely with Jonathan Mawdsley at AFWA to make sure we are as inclusive as possible while not undermining the SSA process.
- To ensure that our assessment will be as accurate and complete as possible, we will use the best scientific and commercial data available in the development of the SSA report.
- We hope to complete the SSA report by December of 2015 and then begin the recovery planning process.
- The Service intends to complete a recovery plan for the lynx DPS by January 15, 2018 in order to meet the court-ordered deadline.
- We continue to welcome any scientific information (e.g., survey results, habitat assessments, modeling efforts, implementation and/or monitoring of conservation measures, verified observations) you wish to provide for our consideration regarding the status, distribution, and likely future condition of lynx and snowshoe hare (*Lepus americanus*) populations and habitats.
- We appreciate the States interest and involvement in Lynx recovery and look forward to continued collaboration throughout this process.

FYI. The SSA process should also meet our need to complete a five year review but we are no longer focusing on that. Feel free to give me a call if you have any questions -thanks. JB

Jodi L. Bush
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Montana Ecological Services Office
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(406) 449-5225, ext.205

From: [Bush, Jodi](#)
To: [Matt Hogan](#)
Subject: Fwd: talking points for Lynx SSA and Recovery planning
Date: Thursday, September 17, 2015 3:34:04 PM

Sorry -just saw your email and realized I should have cc'd you.

Frankly I don't think the directors know what is happening in their own backyards. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
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(406) 449-5225, ext.205

----- Forwarded message -----

From: **Bush, Jodi** <jodi_bush@fws.gov>
Date: Thu, Sep 17, 2015 at 3:32 PM
Subject: Re: talking points for Lynx SSA and Recovery planning
To: "Frazer, Gary" <gary_frazer@fws.gov>
Cc: Michael Thabault <Michael_Thabault@fws.gov>, Noreen Walsh <Noreen_Walsh@fws.gov>

Thanks Gary. I understand. I did want to give you some factoids about the states involvement in this process. I was unable to yesterday as I spent most of the day driving.

We just finalized most of our panelists on Weds. We hope to get confirmation letters out by tomorrow. Here is the rundown of state involvement.

There are 5 units: Maine/NE, Minnesota, WY, MT/ID and WA/PNW. Some folks also include CO, which has an introduced population as well. No CH was designated there.

For your information we have:

Unit 1, ME/NE Jennifer Vashon. She is an employee of the Maine Dept of Inland FW

Unit 2, Minn. We have Roy Moen, University of Minn (and recommended by Rich Baker- Minnesota DNR). We also have Rich Baker as an observer. He seemed very happy with the arrangement.

Unit 3, NW Montana. We have Jay Kolbe from MTFWP.

Unit 4, North Cascades &OK. I have been talking to folks at WDFW trying to find someone. They made 2 recommendations both of which can't make it. We haven't given up.

Unit 5, GYE (Wyoming). Nichole Culbertson of WYFG will be attending as an observer.

We also have Jake Ivan from Colorado CDOW.

So out of 10 panelists and 2 observers, we expect to have 6 state folks represented. Most of the other panelists are University folks, from USFS research stations or USGS.

Hope this is helpful. We will muddle on. JB

Jodi L. Bush
Field Supervisor
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From: [Smith, Tamara](#)
To: [Zelenak, Jim](#)
Cc: [Jodi Bush](#)
Subject: Re: Bowman vs. Murray
Date: Thursday, September 17, 2015 8:23:09 PM

Great. I've looked into S. Handler and M. Nataro, just a bit and don't have a strong preference there either. I recommended Dr. Lee Frelich from the U of MN during our first go-around for potential experts... I still think he would be a great contributor on the climate change issue and his name pops up first to others here.

Hey Jim - sorry just noticed this was in my draft box from the other day.

On Tue, Sep 15, 2015 at 3:39 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Thanks Tam. I agree.

On Tue, Sep 15, 2015 at 2:36 PM, Smith, Tamara <tamara_smith@fws.gov> wrote:

Hi Jim - I haven't had much time today where I was not in a meeting, but I wanted to let you know that I have no strong preferences on Jeff Bowman vs. Dennis Murray. It looks like they are both contributors to many of the same papers and either would be a valuable contributor. If I had to pick one, I would chose Jeff Bowman since his list of papers seem to be more recent and he might cover a niche that we might not yet have within the group of experts - lynx genetics, climate change, and lynx/bobcat hybrid genetics. Again sorry for being brief - I have had not much time today.

Thanks,
-Tam

--

Tamara Smith
U.S. Fish and Wildlife Service
Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425
612-725-3548 ext. 2219
612-600-1599 cell

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
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585 Shepard Way, Suite 1
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(406) 449-5225 ext. 220
jim_zelenak@fws.gov

--

Tamara Smith
U.S. Fish and Wildlife Service
Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425
612-725-3548 ext. 2219
612-600-1599 cell

From: [Catton, Susan J -FS](#)
To: [Zelenak, Jim](#)
Subject: RE: Canada Lynx Expert Elicitation Workshop
Date: Friday, September 18, 2015 9:19:15 AM

Jim,

I understand.

My office phone is 218-626-4304

Tim's office phone is 218-365-7637

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Friday, September 18, 2015 9:27 AM
To: Catton, Susan J -FS
Subject: Re: Canada Lynx Expert Elicitation Workshop

Hi Susan,

Could you please reply with your phone number and Tim's?

I will be sending you (but not Tim, unfortunately) a invitation letter to participate in the expert elicitation workshop next month. As I said, we have to both keep the number of experts at a manageable number and get representation from across the range and southern Canada.

You and Ron Moen will be the Great Lakes/Minnesota reps on the expert panel, whose brains we wish to pick regarding past, current, and likely future status of lynx in the Lower 48. We will also have other experts from other disciplines (forest ecology, climate modeling, etc.) who will provide information for the lynx experts to consider. It looks like we will also have a small number of "observers" as we have received requests to that effect from several of our State partners and from AFWA.

More information to follow soon.

Thanks,

Jim

On Mon, Sep 14, 2015 at 1:51 PM, Catton, Susan J -FS <scatton@fs.fed.us> wrote:

Jim,

I wanted to let you know that I plan to attend and we are trying to schedule some child care so that Tim can attend also.

Looking forward to seeing you in a few weeks. -Susan

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Friday, September 04, 2015 4:48 PM
Subject: Canada Lynx Expert Elicitation Workshop

Greetings!

You have been identified by your peers, the U.S Fish and Wildlife Service, and our State, Federal, and Academic partners as a candidate to participate in a structured expert elicitation workshop that is a crucial part of our Species Status Assessment for the contiguous United States Distinct Population Segment (DPS) of Canada lynx.

The objective of the workshop is to assess the current status of and threats to the various DPS populations and to evaluate the DPS's viability under a range of future threat, habitat condition, and climate scenarios.

The workshop will be held in Minneapolis, Minnesota on Oct. 13-15, 2015.

This is not a formal invitation to participate in the workshop; it is a request to let me know at your earliest convenience whether or not you would be able to attend the workshop on those dates. We hope to finalize the list of invitees and send out formal invitations in the next week or so.

In addition to lynx experts, we are assembling a list of candidates for workshop presentations on boreal forest ecology (distribution, insects, fires, and likely future condition), climate change/ modeling, and the regulatory environment as it pertains to lynx in the Lower 48 states and southern Canada. If you have recommendations for experts on those topics, please also provide them to me with you response.

Thanks for your consideration of and prompt reply to this request.

Cheers!

Jim

--

Jim Zelenak, Biologist
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From: [Zelenak, Jim](#)
To: [Erin Simons-Legaard](#)
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Friday, September 18, 2015 9:58:39 AM

Thanks Erin.

I'm not sure if you've talked with Mark recently, but we've been working on selecting the experts who will "undergo" the formal elicitation (brain-picking) process. We need to keep that panel to a manageable number (10-12) while also getting representation from across the range of the DPS, and we've received some interest from several States and AFWA to make sure we have adequate state representation.

All that said, it looks like Dan H. and Jennifer V. will be the northeast members of the expert panel, and I hope you will also attend as an expert/presenter, along with several other folks in that capacity (some hare experts, forest ecologists, and climate modelers, plus some of our Canadian counterparts). Mark believes, and I agree, that you have some really important work to contribute to this workshop and the lynx status assessment process (and to recovery planning after that). So, I hope you will attend and present your recent forest change, climate, and budworm modeling work.

We hope to have invitation letters out later today, with a more details about venue and general agenda.

In the meantime, we do intend to start the workshop at 1 PM on Tues. Oct. 13 and to wrap up by 4:30 or 5 PM on Thurs., Oct. 15.

Could you please reply with your office phone number for our participant contact info list?

I'm looking forward to meeting you and learning more about your recent work.

Thanks,

Jim

On Thu, Sep 10, 2015 at 12:52 PM, Erin Simons-Legaard <erin.simons@maine.edu> wrote:

Hi Jim,

Sorry for the delay in replying; I was out of town. I am teaching this semester, but I've got guest lecturers lined up for that week, so I should be able to be available.

Thanks,
Erin

Erin Simons-Legaard
Research Assistant Professor
School of Forest Resources
5755 Nutting Hall
University of Maine
Orono, ME 04469-5755
erin.simons@maine.edu

On Fri, Sep 4, 2015 at 5:47 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Greetings!

You have been identified by your peers, the U.S Fish and Wildlife Service, and our State, Federal, and Academic partners as a candidate to participate in a structured expert elicitation workshop that is a crucial part of our Species Status Assessment for the contiguous United States Distinct Population Segment (DPS) of Canada lynx.

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In addition to lynx experts, we are assembling a list of candidates for workshop presentations on boreal forest ecology (distribution, insects, fires, and likely future condition), climate change/ modeling, and the regulatory environment as it pertains to lynx in the Lower 48 states and southern Canada. If you have recommendations for experts on those topics, please also provide them to me with you response.

Thanks for your consideration of and prompt reply to this request.

Cheers!

Jim

--

Jim Zelenak, Biologist
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jim_zelenak@fws.gov

From: [Bush, Jodi](#)
To: [Thabault, Michael](#)
Subject: Re: FW: talking points for Lynx SSA and Recovery planning
Date: Friday, September 18, 2015 10:05:08 AM

for Lynx Recovery Plan? Final by January 2018 (Translates to Draft by January 2017 or earlier). JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Fri, Sep 18, 2015 at 9:57 AM, Thabault, Michael <michael_thabault@fws.gov> wrote:
What is the settlement date?

Michael Thabault
Assistant Regional Director
Ecological Services
U.S. Fish and Wildlife Service
Mountain Prairie Region
303-236-4210
michael_thabault@fws.gov

On Fri, Sep 18, 2015 at 8:24 AM, Bush, Jodi <jodi_bush@fws.gov> wrote:
I'm available this morning anytime.

I am attending the first Montana Sage Grouse Oversight Team (MSGOT) meeting this afternoon. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Fri, Sep 18, 2015 at 8:00 AM, Noreen Walsh <noreen_walsh@fws.gov> wrote:

Let's have a quick strategy session on this before we further.

Thanks,

Noreen

Noreen Walsh

Regional Director

Mountain-Prairie Region

U. S. Fish and Wildlife Service

303 236 7920

From: Frazer, Gary [mailto:gary_frazer@fws.gov]
Sent: Thursday, September 17, 2015 6:00 PM
To: Bush, Jodi
Cc: Michael Thabault; Noreen Walsh; Matt Hogan
Subject: Re: talking points for Lynx SSA and Recovery planning

So. Apparently my response yesterday asking that the States give you some latitude to assemble a panel of a workable and productive size was taken as a "no". There were concerns expressed at last night's reception, and today both Nick Wiley and Jen Mock Schaffer told me that there was trouble brewing with the lynx states.

Your note below regarding the breadth of state participation on the panel will be very welcome and will likely provide relief. I asked Jen and Nick to convey that message, but the sooner you can get that word out to the lynx states, the better. Process, advance information, and timing are all still issues, but this matter of participation will go a long way towards calming things down.

Thanks for your note today. Helped a lot to keep this contained. -- GDF

Gary Frazer

Assistant Director -- Ecological Services

U.S. Fish and Wildlife Service

(202) 208-4646

On Thu, Sep 17, 2015 at 5:32 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:

Thanks Gary. I understand. I did want to give you some factoids about the states involvement in this process. I was unable to yesterday as I spent most of the day driving.

We just finalized most of our panelists on Weds. We hope to get confirmation letters out by tomorrow. Here is the rundown of state involvement.

There are 5 units: Maine/NE, Minnesota, WY, MT/ID and WA/PNW. Some folks also include CO, which has an introduced population as well. No CH was designated there.

For your information we have:

Unit 1, ME/NE Jennifer Vashon. She is an employee of the Maine Dept of Inland FW

Unit 2, Minn. We have Roy Moen, University of Minn (and recommended by Rich Baker- Minnesota DNR). We also have Rich Baker as an observer. He seemed very happy with the arrangement.

Unit 3, NW Montana. We have Jay Kolbe from MTFWP.

Unit 4. North Cascades & OK. I have been talking to folks at WDFW trying to find someone. They made 2 recommendations both of which can't make it. We haven't given up.

Unit 5. GYE (Wyoming). Nichole Culbertson of WYFG will be attending as an observer.

We also have Jake Ivan from Colorado CDOW.

So out of 10 panelists and 2 observers, we expect to have 6 state folks represented. Most of the other panelists are University folks, from USFS research stations or USGS.

Hope this is helpful. We will muddle on. JB

Jodi L. Bush

Field Supervisor

Montana Ecological Services Office

585 Shepard Way, Suite 1

Helena, MT 59601

(406) 449-5225, ext.205

On Wed, Sep 16, 2015 at 4:49 PM, Frazer, Gary <gary_frazer@fws.gov> wrote:

Thanks, Jodi. Update went well, but as expected. Jonathan Mawdsley noted that there were still more states that wanted to be engaged. Jeff Hagener noted that the states thought they should have a rep from within each of the 5(?) recovery units/areas. Jim Connolly from Maine came up afterwards to pass on (ok, complain) that they needed more information on the SSA process and how it would work, that we needed to share with the panelists all the information that we had in advance of the elicitation meeting, that they were unclear about next steps and concerned that they were hearing that the Service was going to have a closed door meeting following the elicitation. Wanted to know how the Service intended to keep the states involved throughout.

I pointed out that this was a transparent and inclusive science process, but not a representative democracy and that the Service needed to find the sweet spot between engaging all those that wanted a seat at the table and keeping the panel to a workable and productive size. Also noted that this is not a prescriptive process, that you're still sorting out the details, and that more information will no doubt be forthcoming. Assume that is all in alignment with what you are doing

So surprise -- you get no credit for including the states, only criticism for not doing to everyone's satisfaction. But you've been there before, looks like you're doing a fine job, and I'm sure this will turn into a positive. Thanks for your investment in bringing the states into something that is obviously of great interest to them. Let me know if you need me to help in any way. -- GDF

Gary Frazer

Assistant Director -- Ecological Services

U.S. Fish and Wildlife Service

(202) 208-4646

On Wed, Sep 16, 2015 at 2:16 PM, Jodi Bush <jodi_bush@fws.gov> wrote:

We are going to work thru SsA and the come up with a process for state involvement as we move forward with recovery plan. We will continue to have coordination calls and many of the state folks are likely to continue to be involved. In field today but happy to chat with you more about this. JB

Sent from my iPhone

On Sep 16, 2015, at 9:12 AM, Frazer, Gary <gary_frazer@fws.gov> wrote:

Jodi -- What are your plans,if any, for continued engagement of states in the recovery planning process?
-- GDF

Gary Frazer

Assistant Director -- Ecological Services

U.S. Fish and Wildlife Service

(202) 208-4646

On Tue, Sep 15, 2015 at 5:18 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:

Hi Gary. Some updates.

I am also adding Noreen on this email as Seth suggested.

Updates to talking points below.

- The Service core team with input from our State partners has identified the expert panelists that will be part of the Lynx SSA. We will share this final list with our partners prior to our monthly call on September 30th.
- We believe, and in discussions with Jonathan Mawsdley of AFWA -he agrees, that we have good representation of State experts among our group of panelists. We considered expertise, range, geographic equity, redundancy and state interest in our identification of panelists.
- Besides the involvement of State experts on the panel, we also will have several State observers in attendance at the SSA workshop. These observers are expected to be liasons to the all states within the range of the lynx.

Please feel free to give me a call if you have questions. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
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(406) 449-5225, ext.205

On Fri, Sep 11, 2015 at 2:24 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:

Hey Gary. Not much has changed since I sent these in July but here you go.

-
- The Service is working on a Lynx Recovery Plan in response to court ordered settlement using the Species Status Assessment process (SSA).
 - The SSA is a structured, transparent, and scientifically-robust status, threat, and viability assessment that is intended to provide the scientific underpinnings for all determinations the Service is required to make in accordance with the Act.
 - Since July of this year, the Service has been coordinating with States and other partners and seeking input from objective, independent experts in lynx ecology, habitat, management, and climate modeling to assess the current status and likely future viability of lynx populations within the DPS.
 - We have been holding monthly calls with State wildlife management agencies within the range of the Lynx DPS to provide updates on our SSA progress.
 - We have also requested and received input from the States on candidates to participate in an expert elicitation workshop that will be held. This workshop is scheduled for mid-October in Minnesota.
 - The Service will continue to seek input at appropriate times during the process regarding the biological status of, and potential threats to, lynx populations within the DPS.
 - The State coordination calls happen the last Wednesday of every month (starting July 29) at 1pm, MTN time. We have 15 states involved with some level of representation.
 - We are working closely with Jonathan Mawdsley at AFWA to make sure we are as inclusive as possible while not undermining the SSA process.
 - To ensure that our assessment will be as accurate and complete as possible, we will use the best scientific and commercial data available in the development of the SSA report.
 - We hope to complete the SSA report by December of 2015 and then begin the recovery planning process.
 - The Service intends to complete a recovery plan for the lynx DPS by January 15, 2018 in order to meet the court-ordered deadline.
 - We continue to welcome any scientific information (e.g., survey results, habitat assessments, modeling efforts, implementation and/or monitoring of conservation measures, verified observations) you wish to provide for our consideration regarding the

status, distribution, and likely future condition of lynx and snowshoe hare (*Lepus americanus*) populations and habitats.

- We appreciate the States interest and involvement in Lynx recovery and look forward to continued collaboration throughout this process.

FYI. The SSA process should also meet our need to complete a five year review but we are no longer focusing on that. Feel free to give me a call if you have any questions -thanks. JB

Jodi L. Bush

Field Supervisor

Montana Ecological Services Office

585 Shepard Way, Suite 1

Helena, MT 59601

(406) 449-5225, ext.205

From: [Willey, Seth](#)
To: [Zelenak, Jim](#)
Subject: Re: Lynx SSA Workshop Oct. 13-15
Date: Friday, September 18, 2015 4:05:28 PM

FYI, I decided to book my flight back at 7:30pm Thursday night (10/15). This leaves a little time for post event debrief, but not a ton. Hopefully this will be sufficient.

Thanks and see you next week,
Seth

Seth L. Willey
Acting Regional ESA Chief
Mountain-Prairie Region, USFWS
Seth_Willey@fws.gov
303-236-4257

On Fri, Sep 18, 2015 at 3:39 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Jodi and I just sent this slightly different letter to 4 of the other experts/"presenters" we agreed to on our last call (Jackson, Schwartz, Simons-Legaard, and Hodges).

I've also attached a new version of workshop participants and contact info (for you - it did not go to recipients of the letter above).

Really - have a great weekend! I mean it.

Talk to you soon.

----- Forwarded message -----

From: Zelenak, Jim <jim_zelenak@fws.gov>
Date: Fri, Sep 18, 2015 at 3:29 PM
Subject: Lynx SSA Workshop Oct. 13-15
To:

Hi All:

Please see the attached invitation to participate in the Oct. 13-15 Lynx SSA Workshop in Minneapolis, along with the hotel information and invitational traveler form (both also attached).

Because we needed to keep the panel to a manageable number (10-12) while also getting representation from across the range of the DPS and in southern Canada, there are other researchers and experts (like you) who we were unable to invite to participate as panelists. Nonetheless, we believe that your expertise is also critical to these discussions and we invite you to participate in the workshop by presenting your research results and/or management insights for consideration by the expert panel.

I hope you are still interested and available to participate in the workshop. If you are unable to attend, please let me know at your earliest convenience.

The workshop facilitators and I will be in touch over the coming weeks to provide additional information on the structured process for the workshop and other details.

Please email or call me if you have any questions, and thanks again for your willingness to participate in this effort.

Cheers!

--

Jim Zelenak, Biologist
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jim_zelenak@fws.gov

From: [Kurt Broderdorp](#)
To: [Bush, Jodi](#); [Heather Bell](#); [Justin Shoemaker](#); [Tamara Smith](#); [Jonathan Cummings](#); [Mary Parkin](#); [Bryon Holt](#); [Mark McCollough](#); [Seth Willey](#)
Cc: [Jim Zelenak](#)
Subject: RE: Hotel Information for SSA meeting
Date: Monday, September 21, 2015 7:20:33 AM

I will also be arriving fairly early on Monday, So I can help out with whatever needs done.

Kurt Broderdorp
US Fish and Wildlife Service
(970) 628-7186

From: Bush, Jodi [mailto:jodi_bush@fws.gov]
Sent: Friday, September 18, 2015 9:11 AM
To: Heather Bell; Justin Shoemaker; Tamara Smith; Jonathan Cummings; Mary Parkin; Bryon Holt; Kurt Broderdorp; Mark McCollough; Seth Willey
Cc: Jim Zelenak
Subject: Hotel Information for SSA meeting

Trying to help Jim out with logistics.

Jim expects to be in Minneapolis early on October 12 (no other choice for flights out of Helena) and is departing on Friday, October 16.

It would be useful if Heather, Mary and Jonathan could show up on Monday as well to make sure logistics and everything was ready to go. Thanks everyone! JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

From: [Sharon Hooley](#)
To: [Zelenak, Jim](#); [Harper, Diana](#)
Cc: [Vashon, Jennifer](#)
Subject: RE: Canada Lynx Expert Elicitation Workshop
Date: Monday, September 21, 2015 7:59:29 AM

You should be able to make the reservations, I called the hotel and they stated there are 30 rooms available.

Sharon

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Friday, September 18, 2015 3:01 PM
To: Harper, Diana
Cc: Vashon, Jennifer; Sharon Hooley
Subject: Re: Canada Lynx Expert Elicitation Workshop

Hi Diana and Jennifer,

I don't think it is possible that all the rooms are booked already, so I suspect it is some other confusion, or that the hotel has not released the block of rooms yet.

I'm copying our Administrative Office, Sharon Hooley, who will contact the hotel and try to get this straightened out. She will get back to you both, but maybe not until Monday.

Sorry for the confusion.

Jim

On Fri, Sep 18, 2015 at 2:45 PM, Harper, Diana <Diana.Harper@maine.gov> wrote:
Jim,

I tried making a hotel reservation for Jennifer Vashon, but was told the block of rooms reserved for this workshop are completely booked and they can't guarantee a room at this rate. Thought I'd get your opinion on what I should do.

Thanks!

Diana Harper, Secretary
Maine Inland Fisheries and Wildlife
Research and Assessment Section
650 State Street
Bangor, ME 04401
Tel: 207-941-4466
Fax: 207-941-4450
Web: www.maine.gov/ifw

Correspondence to and from this office is considered a public record and may be subject to a request under the Maine Freedom of Access Act.

Information that you wish to keep confidential should not be included in email correspondence.

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Friday, September 18, 2015 2:46 PM
Subject: Canada Lynx Expert Elicitation Workshop

Hi All:

Please see the attached invitation to participate as lynx expert panelists at the Oct. 13-15 Lynx SSA Expert Elicitation Workshop in Minneapolis, along with the hotel information and invitational traveler form (both also attached).

You are among the group of experts most familiar with the lynx populations in the contiguous U.S. and southern Canada and who we believe can make the greatest contribution to our understanding of the status of, threats to, and future viability of those populations.

Because we needed to keep the panel to a manageable number (10-12) while also getting representation from across the range of the DPS, there are other lynx researchers and experts (your peers) who we were unable to invite to participate as panelists. We hope some of those will nonetheless attend the workshop and present their research results for you on the expert panel to consider.

I hope you are still interested and available to participate as an expert panelist. If you are unable to attend, please let me know at your earliest convenience.

The workshop facilitators and I will be in touch over the coming weeks to provide additional information on the structured process for the workshop and other details.

Please email or call me if you have any questions, and thanks again for your willingness to participate on this panel.

Cheers!

Jim

--
Jim Zelenak, Biologist
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(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Parkin, Mary](#)
To: [Kurt Broderdorp](#)
Cc: [Bush, Jodi](#); [Heather Bell](#); [Justin Shoemaker](#); [Tamara Smith](#); [Jonathan Cummings](#); [Bryon Holt](#); [Mark McCollough](#); [Seth Willey](#); [Jim Zelenak](#)
Subject: Re: Hotel Information for SSA meeting
Date: Monday, September 21, 2015 8:02:19 AM

I'm planning on arriving Monday. Will check flights today to confirm a time.
Mary

On Mon, Sep 21, 2015 at 9:20 AM, Kurt Broderdorp <Kurt_Broderdorp@fws.gov> wrote:

I will also be arriving fairly early on Monday, So I can help out with whatever needs done.

Kurt Broderdorp

US Fish and Wildlife Service

(970) 628-7186

From: Bush, Jodi [mailto:jodi_bush@fws.gov]

Sent: Friday, September 18, 2015 9:11 AM

To: Heather Bell; Justin Shoemaker; Tamara Smith; Jonathan Cummings; Mary Parkin; Bryon Holt; Kurt Broderdorp; Mark McCollough; Seth Willey

Cc: Jim Zelenak

Subject: Hotel Information for SSA meeting

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It would be useful if Heather, Mary and Jonathan could show up on Monday as well to make sure logistics and everything was ready to go. Thanks everyone! JB

Jodi L. Bush

Field Supervisor

Montana Ecological Services Office

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Mary Parkin

Endangered Species Recovery Coordinator, Northeast Region

U.S. Fish and Wildlife Service, Hadley, MA

Remotely located in Escalante, Utah:

Mailing address PO Box 637, Escalante, UT 84726

Street address 145 North Center St, Escalante, UT 84726

Phone 617-417-3331

Email mary_parkin@fws.gov

From: [Parkin, Mary](#)
To: [Jodi Bush](#); [Jim Zelenak](#); [Jonathan Cummings](#); [Heather Bell](#); [Seth Willey](#)
Subject: lynx agenda
Date: Monday, September 21, 2015 11:47:14 AM

Hi folks,

Here's the agenda for Nathan's ABB meeting that I thought we could use as a starting point for the lynx agenda. Jodi, I'll look at yours and use this (if it makes sense) to fill in some blanks. Will get to you shortly.

Cheers,
Mary

On Wed, Sep 2, 2015 at 11:56 AM, Parkin, Mary <mary_parkin@fws.gov> wrote:

Hi folks,

I just saw this from Nathan, and it might provide a starting point for the lynx meeting agenda. I'm copying it below for your convenience.

Note the time frame, 1.5 days. We've talked about 2.5-3 days for the lynx, and given that the American burying beetle also has some significant uncertainties/ complexities, this makes me feel good that 2.5 is probably adequate for the lynx.

I see that Seth is on the address list for the ABB SSA. Seth, if you have any insights about on how planning is going for the their expert meeting, we'd love to hear them. Or Heather?

Cheers,
Mary

Rough Draft Agenda

ABB SSA Expert Mtg

Oct 8-9, 2015

Thursday, October 8, Begin at 8am ends at 5pm

Friday, October 9, Begin at 8am end at Noon.

Introductions

Meeting Purpose and Objectives

- SSA analysis to inform ESA decisions
- ABB Information Sharing
- Address key areas of uncertainty with expert opinion

Discussion of Expectations: Why SSA and how does this meeting fit into the overall process?

Background

What we think we know:

life history and ecology
historic range
current range

What we'd like to know:

genetic diversity
 population delineation
 population abundance and trends
 threats (environmental stressors and species responses)

Application to Analysis:

population measures (resiliency)
rangewide diversity (genetic and/or ecological)
forecasting future sources of threats
forecasting future species responses

How we're going to use this information?

--

Mary Parkin

Endangered Species Recovery Coordinator, Northeast Region

U.S. Fish and Wildlife Service, Hadley, MA

Remotely located in Escalante, Utah:

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Street address 145 North Center St, Escalante, UT 84726

Phone 617-417-3331

Email mary_parkin@fws.gov

From: [Bush, Jodi](#)
To: [Bell, Heather](#)
Subject: Re: Possibility for maps for the lynx meeting???
Date: Monday, September 21, 2015 1:07:59 PM

yes

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Mon, Sep 21, 2015 at 11:34 AM, Bell, Heather <heather_bell@fws.gov> wrote:

mary and i were thinking that having some large maps of the whole range plus individual maps of the "populations" would be really really useful for some of the elicitation. I didn't want to bother Jim with this request. do you think this is something easy enough to do???? basic usgs as the basis for the maps.

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
Lakewood, CO 80228
303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google
Site: <https://sites.google.com/a/fws.gov/rev/>

From: [Bush, Jodi](#)
To: [Zelenak, Jim](#)
Cc: [Bryon Holt](#)
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Monday, September 21, 2015 3:42:00 PM

so would we move Karen Hodges up to a panel member then? JB

Jodi L. Bush
Field Supervisor
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On Mon, Sep 21, 2015 at 3:31 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

We lost one of our experts.

Jim

----- Forwarded message -----

From: Clayton Apps <clayapps@telus.net>
Date: Mon, Sep 21, 2015 at 9:22 AM
Subject: Re: Canada Lynx Expert Elicitation Workshop
To: "Zelenak, Jim" <jim_zelenak@fws.gov>

Thank you Jim. Unfortunately I am no longer available during that time period. Please let me know if I can be of any assistance as of November or beyond.

best regards,
Clayton Apps

From: [Zelenak, Jim](#)
Sent: Friday, September 18, 2015 12:45 PM
To: undisclosed-recipients:
Subject: Canada Lynx Expert Elicitation Workshop

Hi All:

Please see the attached invitation to participate as lynx expert panelists at the Oct. 13-15 Lynx SSA Expert Elicitation Workshop in Minneapolis, along with the hotel information and invitational traveler form (both also attached).

You are among the group of experts most familiar with the lynx populations in the contiguous U.S. and southern Canada and who we believe can make the greatest contribution to our understanding of the status of, threats to, and future viability of those populations.

Because we needed to keep the panel to a manageable number (10-12) while also getting representation from across the range of the DPS, there are other lynx researchers and experts (your peers) who we were unable to

invite to participate as panelists. We hope some of those will nonetheless attend the workshop and present their research results for you on the expert panel to consider.

I hope you are still interested and available to participate as an expert panelist. If you are unable to attend, please let me know at your earliest convenience.

The workshop facilitators and I will be in touch over the coming weeks to provide additional information on the structured process for the workshop and other details.

Please email or call me if you have any questions, and thanks again for your willingness to participate on this panel.

Cheers!

Jim

--

Jim Zelenak, Biologist
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jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Bush, Jodi](#)
Cc: [Bryon Holt](#)
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Monday, September 21, 2015 3:55:03 PM

I was wondering the same thing. Let me talk it over with Bryon tonight. I think she definitely qualifies as expert because of her hare/lynx work and her overarching background in assessing species at the range periphery.

On Mon, Sep 21, 2015 at 3:42 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:
so would we move Karen Hodges up to a panel member then? JB

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To: "Zelenak, Jim" <jim_zelenak@fws.gov>

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jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Jodi Bush](#)
Cc: [Mark McCollough](#); [Bryon Holt](#); [Kurt Broderdorp](#); [Tamara Smith](#); [Mary Parkin](#); [Heather Bell](#)
Subject: Fwd: Canada Lynx Expert Elicitation Workshop
Date: Monday, September 21, 2015 5:42:40 PM
Attachments: [image011.png](#)
[image009.png](#)
[image012.png](#)
[image010.png](#)

FYI. See Dr. McKelvey's climate/snow modeling recommendation/thoughts below.

----- Forwarded message -----

From: **McKelvey, Kevin -FS** <kmckelvey@fs.fed.us>
Date: Mon, Sep 21, 2015 at 9:21 AM
Subject: RE: Canada Lynx Expert Elicitation Workshop
To: "Zelenak, Jim" <jim_zelenak@fws.gov>

Jim. Yes I can present what I think is known about past and current distributions of lynx and I have been looking at climate change (though I would no longer support the modelling done by Gonzales et al—my views on this whole topic have evolved significantly). I think that you should get folks that know about snow for future modelling. Both lynx and hares are all about snow—soft snow preferably. So Phil Mote would be good. Actually, I would suggest Eric Salathe at U Wash—Eric does really good snow modelling and knows a lot about the whole process of downscaling GCM, which is where the rubber hits the road when it comes to anticipating the future effects on wildlife. Eric could give us a state-of-the art look at snow modelling. He focusses on PNW (as has Phil Mote, for that matter), but the process is general.

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Kevin S. McKelvey, PhD
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Caring for the land and serving people

[Personal web page](#)

[Google profile](#)

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Friday, September 18, 2015 12:46 PM
Subject: Canada Lynx Expert Elicitation Workshop

Hi All:

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I hope you are still interested and available to participate as an expert panelist. If you are unable to attend, please let me know at your earliest convenience.

The workshop facilitators and I will be in touch over the coming weeks to provide additional information on the structured process for the workshop and other details.

Please email or call me if you have any questions, and thanks again for your willingness to participate on this panel.

Cheers!

Jim

--

Jim Zelenak, Biologist

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jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Jackson, Scott -FS](#)
Subject: Lynx Expert Elicitation Workshop
Date: Monday, September 21, 2015 7:51:22 PM

Hi Scott.

We are still working out the details of the agenda, which we will share as soon as we can. We do know that we will get underway at 1 PM on Tues., Oct 13. After introductions and some explanation of the elicitation process and the SSA (Species Status Assessment) framework, then some general background information, we hope to have a few of the overarching, DPS-wide presentations, including yours. In fact, after I provide some background on the listing history of the DPS, I think we will have Kevin M. give a presentation on what we know about historic versus current distribution of lynx in the contiguous U.S.

After that, I'd like to have your presentation - a comparison between the current regulatory environment for lynx on Federal lands and that at the time of listing. That would get us close to the end of the first day, though we would open things up for questions and a little discussion about what we hope to accomplish over the next two full days. We will likely begin Wed. morning with updates on the current status of and threats to each of the DPS populations by the experts most familiar with them.

We are asking presenters to keep presentations to about 20 minutes with another 10 minutes for questions, discussion, clarification.

Of course all this is somewhat contingent on Congress avoiding another government shutdown....

Anyway, I'm looking forward to learning a lot from you and other participants and hope we can accomplish much at the workshop that will inform the SSA and subsequent recovery planning.

Let me know if you have questions.

Thanks again,

Jim

--

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From: [Bush, Jodi](#)
To: [O'Malley, Robin](#)
Subject: Re: connecting lynx assessment group with USGS National Climate Change and Wildlife Science Center
Date: Tuesday, September 22, 2015 7:50:08 AM

Jim wont be available but I will be. We can go from there. JB

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On Tue, Sep 22, 2015 at 6:23 AM, O'Malley, Robin <romalley@usgs.gov> wrote:
830 mtn, 1030 eastern would be better for me, if that works for others.I'll send a calendar invite.

R

Robin O'Malley
Policy and Partnership Coordinator
National Climate Change and Wildlife Science Center
US Geological Survey, Mail Stop 516
12201 Sunrise Valley Drive
Reston, VA 20192
703-648-4086
571-294-0922 (cell)
romalley@usgs.gov
<http://nccwsc.usgs.gov>

On Mon, Sep 21, 2015 at 11:15 AM, Bush, Jodi <jodi_bush@fws.gov> wrote:

Lets do Friday. I'm tied up with full day meetings tomorrow and Weds. Lets say 130PM MTN which would be 3:30PM EDT. If thats too late in the day, I could probably do 830 am MTN, 1030 EDT.

Thanks JB

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On Mon, Sep 21, 2015 at 9:10 AM, O'Malley, Robin <romalley@usgs.gov> wrote:
Understood.

Time to talk?

- Tomorrow between 4 and 7 EDT (meeting ends 4, plane at 745...)
- Wednesday 10-12 EDT or after 3 EDT
- Friday before 11 EDT or after 230 EDT.

(I got an out-of-office from Jim Z)

let me know if any of these times work.

best,

R

Robin O'Malley
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National Climate Change and Wildlife Science Center
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romalley@usgs.gov
<http://nccwsc.usgs.gov>

On Mon, Sep 21, 2015 at 11:04 AM, Bush, Jodi <jodi_bush@fws.gov> wrote:

Hi Robin. Thats sounds good but perhaps us few can chat before a larger call. Because we have already started down a pathway, and the states have recommended some names I don't want to get too far afield of that commitment. When are you available to chat? JB

Jodi L. Bush
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(406) 449-5225, ext.205

On Mon, Sep 21, 2015 at 8:57 AM, O'Malley, Robin <romalley@usgs.gov> wrote:

Folks -- I have gotten positive responses from the Northeast and Alaska CSCs. Both have folks with experience in boreal forest and/or lynx work. Would it make sense to do an email and perhaps try to set up a call for the FWS folks to say more about their needs and the CSC folks to say what they might be able to provide?

I'm happy to do that if it's not getting too far in front of things.

R

Robin O'Malley
Policy and Partnership Coordinator
National Climate Change and Wildlife Science Center
US Geological Survey, Mail Stop 516
12201 Sunrise Valley Drive
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703-648-4086
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romalley@usgs.gov
<http://nccwsc.usgs.gov>

On Fri, Sep 4, 2015 at 9:45 AM, Jonathan Mawdsley
<jmawdsley@fishwildlife.org> wrote:

Hello Jody, Jim, and Robin,

I wanted to connect the three of you, based on a discussion on last week's conference call regarding the Species Status Assessment for Canada Lynx. Jodi and Jim are coordinating the Species Status Assessment process for Canada Lynx on behalf of the U. S. Fish and Wildlife Service. This is a new process to gather scientific information about a species that can then be used to inform a variety of listing and management decisions. Jodi indicated on the call last week that the Service has identified a need for persons with expertise in boreal forest ecology and also persons with expertise in modeling the effects of climate change on boreal forest systems and species. Robin is the Coordinator for the National Climate Change and Wildlife Science Center at USGS (<https://nccwsc.usgs.gov/>) and may be able to help identify persons with specific expertise to inform the species status assessment process for Canada Lynx. Robin, I was thinking that this may be something that Dennis Ojima's group at Colorado State may be able to help inform? Let me know if I can be helpful in making connections – I'd be happy to help arrange a conversation among us on this important topic.

All the best,

Jonathan

Jonathan R. Mawdsley, Ph.D.

Fish and Wildlife Science Coordinator

Association of Fish and Wildlife Agencies

1100 First Street, NE, Suite 825

Washington, DC 20002 USA

Phone: (202) 838-3462

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E-mail: jmawdsley@fishwildlife.org

Web: <http://www.fishwildlife.org>

From: [Smith, Tamara](#)
To: [Parkin, Mary](#)
Cc: [Jim Zelenak](#)
Subject: Re: conceptual model comments
Date: Tuesday, September 22, 2015 4:30:53 PM

Sorry, Mary, I did not get this message until now. I'm at all day meetings this week out of the office, so I wouldn't have been much help with the webex anyway! Hope today's call went well.

On Tue, Sep 22, 2015 at 1:03 AM, Parkin, Mary <mary_parkin@fws.gov> wrote:

Thanks for your notes -- you did indeed capture the substance of our conversation. Re: your first bullet, this tells me we need to be as precise as possible with our terms in these models (always a good thing in my view).

Tam, I've been absolutely full-out today so I'm asking for this favor belatedly. Neither Jim nor Heather have access to their MyMeeting accounts tomorrow, and to date I don't have the ability to set up an account on my remote computer. Here's what I'd like to ask (no harm in asking, right?!): Does your office have a webex account that we could use for the Tues core team call? If so, you could sign on and then share with me, and I think I could load the latest CM and we could work with that online. I'm going to call you first thing in the morning to see if this is a possibility -- if not, we may not be able to do a webinar, and I'll try to compensate for that by having a fill-in list that we could plug into the diagram for the next version.

NOTE: Tomorrow's core team call will be at 10:15 MDT/11:15 CDT. So we'd need to schedule the webinar from say 11-12:30 CDT.

Bottom line: if you have a link we could use for the webinar, that would be wonderful! If not, please let me know and we'll punt!

Thanks again,
Mary

p.s. We can touch base on RPBB soon, too. Not sure where that stands with regard to my involvement, but the question does need to be resolved.

On Mon, Sep 21, 2015 at 11:34 PM, Smith, Tamara <tamara_smith@fws.gov> wrote:

Hi Jim - Mary and I had a good discussion about the draft conceptual model last Thursday - I assume she took some good notes. My notes are not that great but I figured I should share anyway...

Resiliency - Instead of population size, I suggest using a term like stable or improving population trend.

Add competition from bobcats into the resiliency part of the model - negatively affecting hare abundance.

Vehicle collisions, trapping, etc. to resiliency part of the model - negatively affecting female survival and kitten survival (litter size)

Should we make more a distinction between different life stages - adult and kitten and specifics about factors affecting their survival?

Redundancy - should we include Canada popns in this?

Representation - add - Vehicle collisions, trapping, etc. negatively affecting gene flow.

Also - bobcat/lynx hybridization - negatively affecting genetics - not sure where this would fit in - representation?

Where should males be in this model and what is affecting males?

After brainstorming about everything that could be effecting lynx and the model is looking nice and complicated, it would probably be a good idea to highlight the critical pathways in the model to help distinguish and visualize crucial paths (there is a way to do this in mental modeler) while keeping all of the complexities in the background. This may help folks really think about and sort out what we believe to truly be the most important drivers of viability.

Hope you can make sense of these notes!

Thanks,
Tam

--

Tamara Smith
U.S. Fish and Wildlife Service
Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425
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Mary Parkin
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612-600-1599 cell

From: Cindy Schulz
To: [Zicari, Laury](#)
Subject: RE: tribal consultation - examples
Date: Wednesday, September 23, 2015 8:56:04 AM

Laury – thank you. This info is very helpful. I am thinking I will call the interim Chief of the Tribe and ask to meet with him. Find out his priorities and ask him how he would like us to coordinate with him, etc.

Any example letters you have would be much appreciated.

Thanks again for your advice.

From: Zicari, Laury [mailto:laury_zicari@fws.gov]
Sent: Friday, September 18, 2015 12:59 PM
To: Cindy Schulz
Cc: Tom Chapman
Subject: Re: tribal consultation - examples

Hi there!

We have five tribal units we coordinate with and consult with, one unit is comprised of two bands of a single tribe. We have been working with them for so long, we have no formal process; tribal environmental staff biologists participate in site visits and fish and wildlife meetings.

In the case of the Penobscot River Restoration Trust, and in Atlantic salmon recovery activities, the Penobscot Indian Nation is a full partner with Maine Department of marine resources, NOAA and us. We are careful to check with our contacts to see how they want to be "coordinated with". In the case of the Penobscots, the tribal environmental program chief, John Banks, is someone I talk to regularly and I always offer to brief him individually on happenings like, for example, the Atlantic salmon recovery plan, other listings. His staff are on various action teams towards salmon recovery; we dance around FACA compliance every day but always have our radar out to be sure we are being respectful of the nation to nation

and trust relationship we have with them.

Alex Hoar and NOAA worked with the Passamaquoddy Tribe and drafted an MOU to show a commitment to restoration of the St. Croix River but typically when invited, the tribes do not have staff to participate in river restoration type initiatives, with the exception of the Penobscots whose reservation includes the islands in the Penobscot River and Passamaquoddy lands cross the St. Croix river as well.

FHWA has a new initiative and has met with each of our tribes and developed memoranda which commemorate what is important to that Tribe. I love that idea and participated in the second meeting (with the Houlton Band of the Maliseets) towards learning whom they may have as lead for river restoration/habitat issues. One of my goals over the next year is to meet with the tribes and learn about their priorities for fish and wildlife. They were left out of the SWIG meetings until the last minute, unfortunately and their lands were not deemed crucial for conservation by the State...which may have been a bit of a misstep by the State. Finally, Mark McCollough has worked with all of the tribes consulting on forest practices in lynx habitat to ensure that consideration is made towards the species conservation in their management of their timber harvests; tribal lands are sometimes way far away from the main holdings and include large tracts of forest.

The State of Maine and the Wabanaki Confederation are at odds right now over a number of issues including regulation of fishing in the Penobscot River, regulation of eel elver harvests, and water quality standards. These are dark waters indeed and so we do our best to meet our trust responsibilities while not

getting engaged in these legal debates which stem from the Indian Claims Settlement Act of 1980 *et seq.* AND treaties made back when Maine was part of Massachusetts, and thus the treaties were made with THAT state, not ours.

Another really important point is that we are aware that we don't ask the Penobscot's to "represent the interest of the Tribes" as each tribe is independent and has its own government -- unless we are specifically told to do so. When it comes to salmon, the Penobscot Indian Nation lands are pretty much the only lands in the DPS; there is a small bit of upper headwaters in the Downeast part of the state which may be Passamaquoddy land but it is unoccupied and undeveloped at this point in time.

I will see if I can find any examples of letters written to the tribes specifically but based on our long relationship, the coordination is so natural now we do a lot informally.

On Fri, Sep 18, 2015 at 9:05 AM, Cindy Schulz <cindy_schulz@fws.gov> wrote:
Tom – thank you. I appreciate your help.

From: Chapman, Tom [mailto:tom_chapman@fws.gov]
Sent: Friday, September 18, 2015 8:45 AM
To: Cindy Schulz
Cc: Laury Zicari
Subject: Re: tribal consultation - examples

Hi Cindy,

I've provided a couple of recent letters we sent to tribes requesting their participation in two Sandy Projects, I also included the recent tribal consultation handbook which has pertinent information and some example letters.

Tom

On Thu, Sep 17, 2015 at 1:29 PM, Cindy Schulz <cindy_schulz@fws.gov> wrote:
Laury and Tom – on Oct 1, VA will have its first BIA recognized tribe. I was hoping you have example letters you can send me and/or other info you use when coordinating with Tribes in

ME/New England.

Any assistance you can provide would be much appreciated.

Thank you.

Cindy

--

Thomas R. Chapman
Supervisor - New England Field Office
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Northeast Region - Ecological Services
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From: [Bell, Heather](#)
To: [Zelenak, Jim](#)
Cc: [Jodi Bush](#); [Mark McCollough](#); [Bryon Holt](#); [Kurt Broderdorp](#); [Tamara Smith](#); [Mary Parkin](#)
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Wednesday, September 23, 2015 9:17:43 AM
Attachments: [image012.png](#)
[image010.png](#)
[image011.png](#)
[image009.png](#)

sounds good to me. nice of him to recommend someone.

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
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303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>

On Mon, Sep 21, 2015 at 3:42 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

FYI. See Dr. McKelvey's climate/snow modeling recommendation/thoughts below.

----- Forwarded message -----

From: **McKelvey, Kevin -FS** <kmckelvey@fs.fed.us>
Date: Mon, Sep 21, 2015 at 9:21 AM
Subject: RE: Canada Lynx Expert Elicitation Workshop
To: "Zelenak, Jim" <jim_zelenak@fws.gov>

Jim. Yes I can present what I think is known about past and current distributions of lynx and I have been looking at climate change (though I would no longer support the modelling done by Gonzales et al—my views on this whole topic have evolved significantly). I think that you should get folks that know about snow for future modelling. Both lynx and hares are all about snow—soft snow preferably. So Phil Mote would be good. Actually, I would suggest Eric Salathe at U Wash—Eric does really good snow modelling and knows a lot about the whole process of downscaling GCM, which is where the rubber hits the road when it comes to anticipating the future effects on wildlife. Eric could give us a state-of-the art look at snow modelling. He focusses on PNW (as has Phil Mote, for that matter), but the process is general.

salathe@u.washington.edu
+1-425-352-3226



Kevin S. McKelvey, PhD
Research Ecologist
Forest Service

Rocky Mountain Research Station, Wildlife and Terrestrial Ecosystems

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Missoula, MT 59801

www.fs.fed.us



Caring for the land and serving people

[Personal web page](#)

[Google profile](#)

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]

Sent: Friday, September 18, 2015 12:46 PM

Subject: Canada Lynx Expert Elicitation Workshop

Hi All:

Please see the attached invitation to participate as lynx expert panelists at the Oct. 13-15 Lynx SSA Expert Elicitation Workshop in Minneapolis, along with the hotel information and invitational traveler form (both also attached).

You are among the group of experts most familiar with the lynx populations in the contiguous U.S. and southern Canada and who we believe can make the greatest contribution to our understanding of the status of, threats to, and future viability of those populations.

Because we needed to keep the panel to a manageable number (10-12) while also getting representation from across the range of the DPS, there are other lynx researchers and experts (your peers) who we were unable to invite to participate as panelists. We hope some of those will nonetheless attend the workshop and present their research results for you on the expert panel to consider.

I hope you are still interested and available to participate as an expert panelist. If you are

unable to attend, please let me know at your earliest convenience.

The workshop facilitators and I will be in touch over the coming weeks to provide additional information on the structured process for the workshop and other details.

Please email or call me if you have any questions, and thanks again for your willingness to participate on this panel.

Cheers!

Jim

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
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Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Approval Queue](#)
To: JODI_BUSH@FWS.GOV; KAIMY_MARKS@FWS.GOV
Subject: Your request "Lynx SSA Expert Elicitation Workshop" was approved.
Date: Wednesday, September 23, 2015 9:33:07 AM

Your request 'Lynx SSA Expert Elicitation Workshop' was approved.

Approved on 2015, September 23, Wednesday at 11:32 am Eastern Time by: NICOLE ALT

Comments:

This is a system-generated email. Please do not reply.

From: Hicks, Scott
To: [Ann Belleman](mailto:Ann.Belleman)
Subject: Fwd: Forest Service NLEB programmatic consultation
Date: Wednesday, September 23, 2015 9:54:13 AM
Attachments: [Formatted BA NLEB 2015 July 13 update FWS.pdf](#)
[all FS units LAA acres plans.xlsx](#)

sorry was multi tasking (not well!), hopefully this it!

----- Forwarded message -----

From: **Herrington, Karen** <karen_herrington@fws.gov>
Date: Tue, Jul 28, 2015 at 10:19 AM
Subject: Forest Service NLEB programmatic consultation
To: FW3 Coordinators <fw3_fo_es_te_coordinators@fws.gov>, FW3 FO ES Project Leaders <fw3_fo_es_project_leaders@fws.gov>
Cc: Erik Olson <erik_olson@fws.gov>, Jessica Hogrefe <jessica_hogrefe@fws.gov>

Hi all,

I have been filling in for Jessica on the programmatic NLEB consultation for the Forest Service while she is on detail. Attached is the biological assessment and a spreadsheet that includes acreages by activity types that are likely to adversely affect the NLEB. This is not an assignment - I'm sending it as an FYI. If your staff has time to review these documents and note any red flags or items of concern, please let me know. I'm working with Erik Olson to estimate the number of NLEB that may be affected on each forest by each activity type, and we will have more information to share on that effort next week. Thanks!

Karen

Karen Herrington
U.S. Fish and Wildlife Service
Midwest Regional Office, Ecological Services
Remotely located in St. Charles, MO
(850) 348-6495
karen_herrington@fws.gov
Official hours: 6-7 AM CT and 9-4:30 PM

From: [Jodi Bush](#)
To: [Zelenak, Jim](#)
Subject: Re: WA lynx expertise
Date: Wednesday, September 23, 2015 10:23:49 AM

I've talked to Jeff's boss and it sounds like they will have someone there. They are getting back to me later. JB

Sent from my iPhone

On Sep 22, 2015, at 4:52 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Any word from Jeff L. or others?

Just got off the phone with John Squires, he had questions about what we expect of him - he's pretty jazzed now about being there, understands his role and process better; will put together his presentation.

He said that since neither Koehler or Aubry can do the Washington presentation that he (like Mark McCollough...and me, sorta...) recommends we get Naney, that he has as good a feel as anyone right now on status and threats to lynx there. I know he can be challenging in other ways, but I'm getting nervous that we may not have that zone covered.

Let me know what you think.

--

Jim Zelenak, Biologist
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Montana Ecological Services Office
585 Shepard Way, Suite 1
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(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Jodi Bush](#)
To: [Zelenak, Jim](#)
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Wednesday, September 23, 2015 4:05:16 PM
Attachments: [image009.png](#)

I'd have to run name by Idaho to get same level of comfort...

Sent from my iPhone

On Sep 21, 2015, at 3:42 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

FYI. See Dr. McKelvey's climate/snow modeling recommendation/thoughts below.

----- Forwarded message -----

From: **McKelvey, Kevin -FS** <kmckelvey@fs.fed.us>
Date: Mon, Sep 21, 2015 at 9:21 AM
Subject: RE: Canada Lynx Expert Elicitation Workshop
To: "Zelenak, Jim" <jim_zelenak@fws.gov>

Jim. Yes I can present what I think is known about past and current distributions of lynx and I have been looking at climate change (though I would no longer support the modelling done by Gonzales et al—my views on this whole topic have evolved significantly). I think that you should get folks that know about snow for future modelling. Both lynx and hares are all about snow—soft snow preferably. So Phil Mote would be good. Actually, I would suggest Eric Salathe at U Wash—Eric does really good snow modelling and knows a lot about the whole process of downscaling GCM, which is where the rubber hits the road when it comes to anticipating the future effects on wildlife. Eric could give us a state-of-the art look at snow modelling. He focusses on PNW (as has Phil Mote, for that matter), but the process is general.

salathe@u.washington.edu
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Kevin S. McKelvey, PhD
Research Ecologist
Forest Service

Rocky Mountain Research Station, Wildlife and Terrestrial Ecosystems

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kmckelvey@fs.fed.us

800 East Beckwith
Missoula, MT 59801

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[<image010.png><image011.png><image012.png>](#)

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[Google profile](#)

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]

Sent: Friday, September 18, 2015 12:46 PM

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I hope you are still interested and available to participate as an expert panelist. If you are unable to attend, please let me know at your earliest convenience.

The workshop facilitators and I will be in touch over the coming weeks to provide additional information on the structured process for the workshop and other details.

Please email or call me if you have any questions, and thanks again for your willingness to participate on this panel.

Cheers!

Jim

--

Jim Zelenak, Biologist

U.S. Fish and Wildlife Service

Montana Ecological Services Office

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(406) 449-5225 ext. 220

jim_zelenak@fws.gov

--

Jim Zelenak, Biologist

U.S. Fish and Wildlife Service

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(406) 449-5225 ext. 220

jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Jodi Bush](#)
Subject: Re: Climate experts for lynx workshop
Date: Wednesday, September 23, 2015 4:15:06 PM

too late.... you have some 'splainin' to do..... ;-)

On Wed, Sep 23, 2015 at 4:11 PM, Jodi Bush <jodi_bush@fws.gov> wrote:

I agree.

Don't believe a word Brad tells you. JB

Sent from my iPhone

On Sep 23, 2015, at 4:10 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

I've called Josh Lawler (left message), Phil Mote (spoke briefly - he will call me tomorrow afternoon), and Louis Iverson (left message).

Unless you feel otherwise, I will ask Tam to try to contact Lee Frelich, who, being at Univ. of Minn., may be one of the better bets for availability on short notice.

With all 3 I contacted, I asked about their attendance at the workshop or if not, the possibility of a remote presentation/webinar.

I let you know what I hear back from them. I'll look forward to catching up on your discussion with O'Malley.

Getting to know Brad Thompson from your old office - really nice guy.

Hope all is well there.

--

Jim Zelenak, Biologist
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(406) 449-5225 ext. 220
jim_zelenak@fws.gov

--

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585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225 ext. 220

jim_zelenak@fws.gov

From: [Bush, Jodi](#)
To: [Jim Zelenak](#)
Subject: Fwd: Lynx Panel
Date: Thursday, September 24, 2015 9:47:17 AM

fyi

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

----- Forwarded message -----

From: **Becker, Penny A (DFW)** <Penny.Becker@dfw.wa.gov>
Date: Thu, Sep 24, 2015 at 8:58 AM
Subject: Lynx Panel
To: "jodi_bush@fws.gov" <jodi_bush@fws.gov>
Cc: "Maletzke, Benjamin T (DFW)" <Benjamin.Maletzke@dfw.wa.gov>, "Lewis, Jeffrey C (DFW)" <Jeffrey.Lewis@dfw.wa.gov>

Hi Jodi,

Ben Maletzke will be attending the panel discussion on behalf of Washington.

I understand from our conversation that he will need to bring a 20 min presentation on the state of the science and status of lynx in WA. Thanks for filling in the gaps for logistics and other details for him when you can.

Appreciate your time,

Penny

Penny A. Becker, Ph.D.

Acting Wildlife Diversity Division Manager

Washington Department of Fish and Wildlife

600 Capital Way North

Olympia WA 98501

Office: 360-902-2694

WHATS ON YOUR PLATE?



The purchase of a Personalized License Plate or an Orca or Eagle Background Plate provides important funding for wildlife and habitat conservation in Washington.

Will you support Washington's wildlife?

From: [Becker, Penny A \(DFW\)](#)
To: jodi_bush@fws.gov
Cc: [Maletzke, Benjamin T \(DFW\)](#); [Lewis, Jeffrey C \(DFW\)](#)
Subject: Lynx Panel
Date: Thursday, September 24, 2015 8:58:58 AM

Hi Jodi,

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From: [Bush, Jodi](#)
To: [Becker, Penny A \(DFW\)](#)
Cc: [Maletzke, Benjamin T \(DFW\)](#); [Lewis, Jeffrey C \(DFW\)](#)
Subject: Re: Lynx Panel
Date: Thursday, September 24, 2015 9:01:30 AM

Awesome. Thanks Penny. Appreciate your and Jeff's help on this. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Thu, Sep 24, 2015 at 8:58 AM, Becker, Penny A (DFW) <Penny.Becker@dfw.wa.gov> wrote:

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I understand from our conversation that he will need to bring a 20 min presentation on the state of the science and status of lynx in WA. Thanks for filling in the gaps for logistics and other details for him when you can.

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From: [Parkin, Mary](#)
To: [Jim Zelenak](#)
Cc: [Jodi Bush](#); [Heather Bell](#); [Jonathan Cummings](#); [Seth Willey](#)
Subject: Thoughts for presenters at lynx meeting
Date: Thursday, September 24, 2015 9:04:30 AM

Hi Jim,

As I mentioned on the call last Monday, it would be good to prime the presenters regarding what information/level of detail will be most useful. Here are a few things you might want to emphasize to those who will be presenting the status update for each population. (Of course, you have the final say!)

The reason we need this information at the meeting is to gain a common understanding of (1) lynx numbers, fluctuations, and trends across the range; (2) habitat variation and connectivity across the range; (3) variation in threats and potential catastrophic/stochastic events across the range. And if there's anything else that may set a particular population apart (e.g., isolation of the CO pop or unique genetic traits in the ME pop), that would be good to know, too. This information is what will allow us to assess rangewide status in terms of the 3Rs.

Also, we need this information at a level of detail that will allow us to determine if there are enough differences among the populations, or between, say, eastern and western populations, that we need to develop multiple models. No more, no less.

Oh, and identification of uncertainties with regard to population status will be important.

That's a tall order for each presenter. I think the level of detail is key to making sure all the important bases are covered.

You can put these thoughts into much better words, I'm sure. The bottom line is that we want the presenters to focus on information that is relevant to the cause-effect relationships we'll be exploring during the meeting.

Hope you're having a great learning experience this week!

Mary

--

Mary Parkin
Endangered Species Recovery Coordinator, Northeast Region
U.S. Fish and Wildlife Service, Hadley, MA
Remotely located in Escalante, Utah:
Mailing address PO Box 637, Escalante, UT 84726
Street address 145 North Center St, Escalante, UT 84726
Phone 617-417-3331
Email mary_parkin@fws.gov

From: [Bush, Jodi](#)
To: [Sharon Hooley](#)
Subject: Fwd: Lynx meeting in MN
Date: Thursday, September 24, 2015 9:09:30 AM

just sharing as I agreed that we could fly Nichole in a day early. I doubt there is a cost difference. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

----- Forwarded message -----

From: **Jodi Bush** <jodi_bush@fws.gov>
Date: Wed, Sep 23, 2015 at 10:15 AM
Subject: Re: Lynx meeting in MN
To: Nichole Cudworth <nichole.cudworth@wyo.gov>
Cc: Zack Walker <zack.walker@wyo.gov>

That's fine Nichole. I'm out of the office this morning but will try to send you the info this afternoon. We look forward to having you there. JB

Sent from my iPhone

On Sep 23, 2015, at 9:53 AM, Nichole Cudworth <nichole.cudworth@wyo.gov> wrote:

Hi Jodi,

I wanted to pass along that I have officially received approval from our administration for out of state travel for the lynx meeting next month. I was hoping to coordinate with you about scheduling, plane tickets, and hotels. From what I've heard from Zack, it sounds like the Service would buy the plane ticket, but I wanted to double check with you on that to see what you needed from me.

Along those lines, I was hoping the Service would be amenable to me flying into Minneapolis a day earlier than is necessary for the meeting. I just had a family member transferred to the Mayo Clinic today, likely for long-term care, and I was hoping to be able to take a day to visit, since Minneapolis is so close to Rochester. I would of course cover any additional travel expenses that this might cost.

Please let me know if this would work, what you need from me, and what I can do to help get things booked for now. Thanks again for the invitation for Wyoming to attend this meeting.

Thank you,
Nichole

--

Nichole (Cudworth) Bjornlie
Nongame Mammal Biologist
Wyoming Game and Fish Department
260 Buena Vista Drive
Lander, WY 82520
wgfd.wyo.gov
nichole.cudworth@wyo.gov
W 307.332.7723 ext. 230
F 307.332.6669

E-Mail to and from me, in connection with the transaction of public business, is subject to the Wyoming Public Records Act and may be disclosed to third parties.

From: lynxdan@gmail.com
To: Zelenak, Jim
Cc: Mark McCollough; Jodi_bush@fws.gov
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Thursday, September 24, 2015 9:25:17 AM

Hi Jim,

I have booked my travel and will forward my air itinerary. I am scheduled to arrive MSP at 11:07 AM on the day of the workshop. I look forward to participating as an expert panelist and will cover my expenses from an existing grant between UMaine and FWS for lynx and snowshoe hare work. Please forward an agenda when available as I have a short window next week to prepare for the meeting.

See you soon.

Dan

Daniel J. Harrison
Professor and Chair - Department of Wildlife, Fisheries, and Conservation Biology
Cooperating Professor of Sustainable Forestry
The University of Maine
5755 Nutting Hall, Room 210
Orono, ME 04469-5755
(207) 581-2867
harrison@maine.edu

On Fri, Sep 18, 2015 at 2:45 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi All:

Please see the attached invitation to participate as lynx expert panelists at the Oct. 13-15 Lynx SSA Expert Elicitation Workshop in Minneapolis, along with the hotel information and invitational traveler form (both also attached).

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Please email or call me if you have any questions, and thanks again for your willingness to participate on this panel.

Cheers!

Jim

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
 [\(406\) 449-5225 ext. 220](tel:(406)449-5225)
jim_zelenak@fws.gov

From: lynxdan@gmail.com
To: Zelenak, Jim
Cc: Mark McCollough; Jodi_bush@fws.gov
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Thursday, September 24, 2015 11:25:08 AM

Hi Jim,

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Dan

Daniel J. Harrison
Professor and Chair - Department of Wildlife, Fisheries, and Conservation Biology
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 [\(406\) 449-5225 ext. 220](tel:(406)449-5225)
jim_zelenak@fws.gov

From: [Bush, Jodi](#)
To: [Parkin, Mary](#)
Cc: [Jim Zelenak](#); [Heather Bell](#); [Jonathan Cummings](#); [Seth Willey](#)
Subject: Re: CLEAN AGENDA for lynx meeting
Date: Thursday, September 24, 2015 12:55:51 PM

Good -cuz our panelists are asking for it! JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
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(406) 449-5225, ext.205

On Thu, Sep 24, 2015 at 11:59 AM, Parkin, Mary <mary_parkin@fws.gov> wrote:

Hi all,

You can disregard the marked-up agenda I sent a few hours ago. Since then, Heather and I have talked, and I've made more changes and cleaned up the draft. This version will be much easier to assimilate! We can discuss on Monday.

Cheers,
Mary

--

*Mary Parkin
Endangered Species Recovery Coordinator, Northeast Region
U.S. Fish and Wildlife Service, Hadley, MA
Remotely located in Escalante, Utah:
Mailing address PO Box 637, Escalante, UT 84726
Street address 145 North Center St, Escalante, UT 84726
Phone 617-417-3331
Email mary_parkin@fws.gov*

From: [Hooley, Sharon](#)
To: [Jodi Bush](#)
Subject: Fwd: Lynx Meeting in MN
Date: Thursday, September 24, 2015 1:32:33 PM

Okay, so if I include the meeting room rental and the AV equipment - \$900/day, and Jim's and your travel costs - \$2600/day the total will be \$31,000, so we round up to \$33,000??

Sharon

Sharon Hooley
Administrative Officer
MT ES Office
585 Shepard Way
Helena, MT 59601

----- Forwarded message -----

From: **Hooley, Sharon** <sharon_hooley@fws.gov>
Date: Thu, Sep 24, 2015 at 1:25 PM
Subject: Lynx Meeting in MN
To: Jodi Bush <jodi_bush@fws.gov>

Jodi - I figured out the travel- using my best guess for the airfare, but the total comes in at \$25,700 so I would like to round up and say that the cost will be \$28,000.

Sharon

Sharon Hooley
Administrative Officer
MT ES Office
585 Shepard Way
Helena, MT 59601

From: [Bush, Jodi](#)
To: [Nicole Alt](#)
Cc: [Michael Thabault](#); [Patricia Bergstrom](#); [Sharon Hooley](#)
Subject: Lynx SSA Workshop in Minneapolis
Date: Thursday, September 24, 2015 1:41:19 PM

Nicole. As we discussed in our phone call, I wanted to remind folks of our commitment to pay for the Lynx SSA workshop in Minneapolis the week of October 13-16, 2015. That commitment includes the cost of the meeting rooms and AV equipment and travel for Montana staff as well as invitational travel for expert panelists and attendees traveling to Minnesota. We estimate that the cost will be about \$30,000. We have about 20 Experts and Presenters from State and Federal agencies, and Universities. We do have the money earmarked in our MTESO budget but as we expect the costs of this event to occur into FY2016, we wanted to make sure those funds remained available. Please feel free to give me a call if you have questions. Thanks. JB

As a reminder:

We are conducting a species status assessment (SSA) as a first step to understand the current status of the lynx. This SSA is intended to inform and streamline the court-ordered recovery plan (due January 15, 2018), assuming such a plan is deemed necessary. The SSA report will also serve as the basis for the five-year status review (initiated in 2007; 72 FR 19549) required under the Act and would also provide the scientific foundation to support future rulemaking in accordance with the Act should the five-year review indicate that a change in the DPS's listing status is warranted.

Species Status Assessment: The SSA framework is a new, standardized Service methodology for assessing the status of species, which can help inform species listing, status, and recovery determinations that the Service is required to make in accordance with section 4(c)(2) of the Act (<https://sites.google.com/a/fws.gov/ssa/about-SSA>). Using the SSA framework, we will evaluate the viability of the lynx DPS and potential threats to its viability using the principles of representation, resilience, and redundancy. The SSA also will provide critical information needed to guide the recovery planning process, including identification of the primary threats to the lynx DPS that remain to be resolved, if any. Completion of the SSA is the first step in the process of determining the current status of the lynx DPS. We anticipate (*read HOPE*) that the SSA will be completed by December 2015.

- *Out of 11 experts, 7 presenters and 3 observers; 7 (a third) work for State Wildlife agencies -representing each geographic area within the range of the lynx.*

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

From: [Bell, Heather](#)
To: [Parkin, Mary](#)
Cc: [Jim Zelenak](#); [Jodi Bush](#); [Jonathan Cummings](#); [Seth Willey](#)
Subject: Re: CLEAN AGENDA for lynx meeting
Date: Thursday, September 24, 2015 2:36:38 PM

I think as a draft to get out to folks now this looks really good as I can see the objectives within the agenda. I really like doing the rangewide climate change presentation early (first day) and then bringing in further discussion and application throughout the next two days. we can fine tune later if we need to. Thanks Mary! h

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
Lakewood, CO 80228
303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>

On Thu, Sep 24, 2015 at 11:59 AM, Parkin, Mary <mary_parkin@fws.gov> wrote:

Hi all,

You can disregard the marked-up agenda I sent a few hours ago. Since then, Heather and I have talked, and I've made more changes and cleaned up the draft. This version will be much easier to assimilate! We can discuss on Monday.

Cheers,
Mary

--

Mary Parkin
Endangered Species Recovery Coordinator, Northeast Region
U.S. Fish and Wildlife Service, Hadley, MA
Remotely located in Escalante, Utah:
Mailing address PO Box 637, Escalante, UT 84726
Street address 145 North Center St, Escalante, UT 84726
Phone 617-417-3331
Email mary_parkin@fws.gov

From: [Bush, Jodi](#)
To: [Ivy Allen](#)
Cc: [Jim Zelenak](#)
Subject: Re: Lynx Tribal Question
Date: Thursday, September 24, 2015 2:55:13 PM

Looking at his calendar he is not in on Monday or tuesday morning. And I'm out thru weds. I suggest you try to do Tues afternoon (without me) if you can or look at thurs/friday next week. Thanks JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
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(406) 449-5225, ext.205

On Thu, Sep 24, 2015 at 2:37 PM, Ivy Allen <ivy_allen@fws.gov> wrote:

Ok, Jodi. Thanks for the update. I am asking them about Monday/Tuesday availability.

Ivy Allen | Tribal Communication Specialist | U.S. Fish and Wildlife Service | Mountain-Prairie Region | 134 Union Blvd., Lakewood, CO 80228 | Ivy.Allen@fws.gov | 303-236-4575

From: Bush, Jodi [mailto:jodi_bush@fws.gov]
Sent: Thursday, September 24, 2015 12:55 PM
To: Ivy Allen
Cc: Jim Zelenak
Subject: Re: Lynx Tribal Question

Ugh no. Jim is out until Monday. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Thu, Sep 24, 2015 at 11:56 AM, Ivy Allen <ivy_allen@fws.gov> wrote:

Jim, is there a chance you could do the call tomorrow? Everyone could Join.

Ivy Allen | Tribal Communication Specialist | U.S. Fish and Wildlife Service | Mountain-Prairie Region | 134 Union Blvd., Lakewood, CO 80228 | Ivy.Allen@fws.gov | 303-236-4575

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Tuesday, September 15, 2015 2:38 PM
To: Ivy Allen
Cc: Jodi Bush
Subject: Re: Lynx Tribal Question

Thanks Ivy!

That would be great if you could send that email and set up the call based on their responses.

Jim

On Tue, Sep 15, 2015 at 2:10 PM, Ivy Allen <ivy_allen@fws.gov> wrote:

I think I could do that without any problem. Let send them an email and see if they are open to that idea.

Ivy Allen | Tribal Communication Specialist | U.S. Fish and Wildlife Service | Mountain-Prairie Region | 134 Union Blvd., Lakewood, CO 80228 | Ivy.Allen@fws.gov | 303-236-4575

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Tuesday, September 15, 2015 1:46 PM
To: Ivy Allen
Cc: Jodi Bush
Subject: Lynx Tribal Question

Hi Ivy,

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We need to discuss whether we could get one or maybe two tribal representatives to participate as observers at the Lynx SSA Expert Elicitation Workshop we will be holding in Minneapolis Oct. 13-15, and to find out if such representatives might agree to listen and provide information to other tribes in the lynx DPS range (or how we might best go about asking that).

Give a call if you would like to discuss.

Thanks,

Jim

--

Jim Zelenak, Biologist

U.S. Fish and Wildlife Service

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jim_zelenak@fws.gov

--

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(406) 449-5225 ext. 220

jim_zelenak@fws.gov

From: [Bush, Jodi](#)
To: [Zelenak, Jim](#)
Cc: [Ivy Allen](#)
Subject: Re: Lynx Tribal Question
Date: Thursday, September 24, 2015 3:43:19 PM

are you available monday? It looks like you are on leave?

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Thu, Sep 24, 2015 at 3:40 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi Ivy,

Is there any way we can do it Mon. or Tues. next week. I'm at NCTC and need to leave for Dulles right after class tomorrow at lunch so I can exchange work rental for personal rental and get to southeast PA before dark (or too late).

On Thu, Sep 24, 2015 at 11:56 AM, Ivy Allen <ivy_allen@fws.gov> wrote:

Jim, is there a chance you could do the call tomorrow? Everyone could Join.

Ivy Allen | Tribal Communication Specialist | U.S. Fish and Wildlife Service | Mountain-Prairie Region | 134 Union Blvd., Lakewood, CO 80228 | Ivy_Allen@fws.gov | 303-236-4575

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To: Ivy Allen
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Sent: Tuesday, September 15, 2015 1:46 PM
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Give a call if you would like to discuss.

Thanks,

Jim

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Jim Zelenak, Biologist

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jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Parkin, Mary](#)
Cc: [Jodi Bush](#); [Mark McCollough](#); [Bryon Holt](#); [Kurt Broderdorp](#); [Tamara Smith](#); [Heather Bell](#)
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Thursday, September 24, 2015 5:08:39 PM
Attachments: [image010.png](#)
[image012.png](#)
[image009.png](#)
[image011.png](#)

Nope. Still working on it - waiting for return calls. Louis Iverson (tree/climate modeling guy with USDA Research Station in Ohio) will not be able to make it to the workshop. He recommended a few folks, and I'm about to email him for details/contact info.

I spoke briefly yesterday with Phil Mote with the Oregon Climate Change Research Institute (OSU) and expect a call from him soon.

I also left a message with Josh Lawler at University of Washington and will email him now to follow-up.

I've also asked Tam if she can try to track down Dr. Lee Frelich now that Iverson has relayed his unavailability.

I think Jodi will have talk with Robin O'Malley tomorrow to discuss other possibilities.

Jim

On Thu, Sep 24, 2015 at 8:46 AM, Parkin, Mary <mary_parkin@fws.gov> wrote:

Jim, do we have the snow condition expertise adequately represented by folks you've already invited?

Thanks,
Mary

On Mon, Sep 21, 2015 at 5:42 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

FYI. See Dr. McKelvey's climate/snow modeling recommendation/thoughts below.

----- Forwarded message -----

From: **McKelvey, Kevin -FS** <kmckelvey@fs.fed.us>
Date: Mon, Sep 21, 2015 at 9:21 AM
Subject: RE: Canada Lynx Expert Elicitation Workshop
To: "Zelenak, Jim" <jim_zelenak@fws.gov>

Jim. Yes I can present what I think is known about past and current distributions of lynx and I have been looking at climate change (though I would no longer support the modelling done by Gonzales et al—my views on this whole topic have evolved significantly). I think that you should get folks that know about snow for future modelling. Both lynx and hares are all about snow—soft snow preferably. So Phil Mote would be good. Actually, I would suggest Eric Salathe at U Wash—Eric does really good snow modelling and knows a lot about the whole process of downscaling GCM, which is where the rubber hits the road when it comes to anticipating the

future effects on wildlife. Eric could give us a state-of-the art look at snow modelling. He focusses on PNW (as has Phil Mote, for that matter), but the process is general.

salathe@u.washington.edu

+1-425-352-3226



Kevin S. McKelvey, PhD
Research Ecologist
Forest Service

Rocky Mountain Research Station, Wildlife and Terrestrial Ecosystems

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Caring for the land and serving people

[Personal web page](#)

[Google profile](#)

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]

Sent: Friday, September 18, 2015 12:46 PM

Subject: Canada Lynx Expert Elicitation Workshop

Hi All:

Please see the attached invitation to participate as lynx expert panelists at the Oct. 13-15 Lynx SSA Expert Elicitation Workshop in Minneapolis, along with the hotel information and invitational traveler form (both also attached).

You are among the group of experts most familiar with the lynx populations in the contiguous U.S. and southern Canada and who we believe can make the greatest contribution to our understanding of the status of, threats to, and future viability of those populations.

Because we needed to keep the panel to a manageable number (10-12) while also getting

representation from across the range of the DPS, there are other lynx researchers and experts (your peers) who we were unable to invite to participate as panelists. We hope some of those will nonetheless attend the workshop and present their research results for you on the expert panel to consider.

I hope you are still interested and available to participate as an expert panelist. If you are unable to attend, please let me know at your earliest convenience.

The workshop facilitators and I will be in touch over the coming weeks to provide additional information on the structured process for the workshop and other details.

Please email or call me if you have any questions, and thanks again for your willingness to participate on this panel.

Cheers!

Jim

--

Jim Zelenak, Biologist

U.S. Fish and Wildlife Service

Montana Ecological Services Office

585 Shepard Way, Suite 1

Helena, MT 59601

(406) 449-5225 ext. 220

jim_zelenak@fws.gov

--

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Mary Parkin
Endangered Species Recovery Coordinator, Northeast Region
U.S. Fish and Wildlife Service, Hadley, MA
Remotely located in Escalante, Utah:
Mailing address PO Box 637, Escalante, UT 84726
Street address 145 North Center St, Escalante, UT 84726
Phone 617-417-3331
Email mary_parkin@fws.gov

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jim_zelenak@fws.gov

From: [Maletzke, Benjamin T \(DFW\)](#)
To: [Bush, Jodi](#)
Cc: [Becker, Penny A \(DFW\)](#); [Jim Zelenak](#)
Subject: RE: Canada Lynx Expert Elicitation Workshop
Date: Thursday, September 24, 2015 5:09:27 PM

Thank you Jodi. I will look over these documents and let Jim know if I have any questions.

Cheers,
Ben

Benjamin T Maletzke, PhD

Wildlife Biologist 2
Washington Department of Fish and Wildlife
PO Box 238
South Cle Elum, WA 98943
(509) 592-7324
"Wildlife 932"

From: Bush, Jodi [mailto:jodi_bush@fws.gov]
Sent: Thursday, September 24, 2015 8:08 AM
To: Maletzke, Benjamin T (DFW)
Cc: Becker, Penny A (DFW); Jim Zelenak
Subject: Fwd: Canada Lynx Expert Elicitation Workshop

Hi Ben. Thanks for agreeing to participate.

Please see the attached invitation for more information including hotel information and invitational travel, if needed. The Lynx SSA Expert Elicitation Workshop will take place Oct. 13-15, 2015 in Minneapolis.

The workshop facilitators and Jim Zelenak (Service Lynx lead) are likely to be in touch with you over the coming weeks to provide additional information on the structured process for the workshop and other details.

Please email or call Jim at (406) 449-5225, ext. 220 if you have any questions, and thanks again for your willingness to participate on this panel. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

From: Zicari, Laury
To: [Kaimy Marks](#)
Subject: Re: Funding for lynx expert meeting - MAINE invitational travelers
Date: Friday, September 25, 2015 7:10:15 AM

Mark is on leave today and won't be back til Monday.....thanks for copying me on the note.

On Thu, Sep 24, 2015 at 3:45 PM, Kaimy Marks <kaimy_marks@fws.gov> wrote:

Hi Mark-

Just checking/confirming – were you able to get Erin Simons set up as an invitational traveler and take care of her for this meeting?

And Dan Harrison and Jennifer Vashon will **NOT** need travel assistance?

Please let me know, don't want to assume anything and drop the ball!

Kaimy Marks

Administrative Support Assistant

U.S. Fish & Wildlife Service

Montana Ecological Services Office

585 Shepard Way, Suite 1, Helena, MT 59601

406-449-5225 X207

From: McCollough, Mark [mailto:mark_mccollough@fws.gov]
Sent: Wednesday, August 26, 2015 8:43 AM
To: Zelenak, Jim
Cc: Laury Zicari; Sharon Hooley; Kaimy Marks; Jodi Bush
Subject: Re: Funding for lynx expert meeting

Jim et al:

I believe only Erin Simons from Maine needs travel assistance to MN. We have funds here that we could apply to Erin's travel. We are having her fill out Invitational Travel forms today to get her into the Concur system before it closes for the end of the fiscal year. We cannot proceed further in Concur with Travel Authorization, etc. until we have further logistic info for the upcoming meeting.

Any thoughts, concerns?

thanks, Mark McCollough

On Wed, Aug 26, 2015 at 10:35 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Thanks Mark and Laury.

I've copied Jodi and our Administrative Experts here. I'm guessing any help will be welcomed, but will let Sharon or Kaimy reply if they foresee any issues/difficulties with the Maine Field Office paying travel and lodging costs for non-USFWS Maine participants in the Lynx SSA Expert Elicitation Workshop in Minneapolis in mid-Oct.

On Tue, Aug 25, 2015 at 1:07 PM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Jim: I just talked to Laury about our call today and sent an email to our three potential invitees from Maine. We have some end-of-year funds that we would like to use. I reminded the Maine invitees that we are still planning the Oct 13-15 meeting and that if they need help with funding to let our field office know by Friday. Laury supports obligating funds for airfare and hotel for the three from Maine (perhaps they could cover their per diem?), if needed.

Is this OK with you folks???

Mark

--

Mark McCollough, Ph.D.
Endangered Species Specialist
Maine Field Office
U. S. Fish and Wildlife Service
17 Godfrey Drive, Suite 2
Orono, ME 04473
Phone 207 866-3344 x115
Cell Phone: 207 944-5709
mark_mccollough@fws.gov

--

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Laury Zicari
Field Supervisor
Maine Field Office
17 Godfrey Drive, Suite 2
Orono, ME 04473
207-866-3344 x 1111
Fax 866-3351
Cell 207-949-0561

From: [Parkin, Mary](#)
To: [Zelenak, Jim](#)
Cc: [Jodi Bush](#); [Heather Bell](#); [Jonathan Cummings](#); [Seth Willey](#)
Subject: Re: CLEAN AGENDA for lynx meeting
Date: Friday, September 25, 2015 7:17:24 AM

Sounds good, Jim. I'm glad you had a chance to look at it and make the necessary fixes.
Thanks!

Safe travels, Seth and Jim, and a good weekend to all,
Mary

On Fri, Sep 25, 2015 at 6:52 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Thanks Mary.

This looks good in general but there are a few necessary corrections that I'd like to make before we send this out to experts or other participants.

I will work on these revisions but may not be able to share with the group until Tues. morning. I've been discussing the tentative agenda verbally or via email with some of the presenters and they have a general understanding of our expectations.

On Thu, Sep 24, 2015 at 11:59 AM, Parkin, Mary <mary_parkin@fws.gov> wrote:

Hi all,

You can disregard the marked-up agenda I sent a few hours ago. Since then, Heather and I have talked, and I've made more changes and cleaned up the draft. This version will be much easier to assimilate! We can discuss on Monday.

Cheers,
Mary

--

Mary Parkin
Endangered Species Recovery Coordinator, Northeast Region
U.S. Fish and Wildlife Service, Hadley, MA
Remotely located in Escalante, Utah:
Mailing address PO Box 637, Escalante, UT 84726
Street address 145 North Center St, Escalante, UT 84726
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Email mary_parkin@fws.gov

From: [Bush, Jodi](#)
To: [Ivy Allen](#)
Cc: [Jim Zelenak](#)
Subject: Re: Lynx Tribal Question
Date: Friday, September 25, 2015 8:27:05 AM

thanks Ivy. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
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On Thu, Sep 24, 2015 at 3:58 PM, Ivy Allen <ivy_allen@fws.gov> wrote:

I have emailed the Tribal folks and let them know I would send out a doodle poll for a date/time. I will put Tues from noon on and any other preference times you send me, Jim.

Ivy Allen | Tribal Communication Specialist | U.S. Fish and Wildlife Service | Mountain-Prairie Region | 134 Union Blvd., Lakewood, CO 80228 | Ivy.Allen@fws.gov | 303-236-4575

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Thursday, September 24, 2015 3:48 PM
To: Bush, Jodi
Cc: Ivy Allen
Subject: Re: Lynx Tribal Question

I could make a call on Mon. between 10 AM and noon Mountain Time if I can call in from my cell (i.e., if someone else can set up the conference line and email it to me).

Otherwise, I will be back in the office about 9 AM Tues. but have a Core Team call from 10-11 - so any time after that would work.

On Thu, Sep 24, 2015 at 12:54 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:

Ugh no. Jim is out until Monday. JB

Jodi L. Bush

Field Supervisor

Montana Ecological Services Office

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From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]

Sent: Tuesday, September 15, 2015 2:38 PM

To: Ivy Allen

Cc: Jodi Bush

Subject: Re: Lynx Tribal Question

Thanks Ivy!

That would be great if you could send that email and set up the call based on their responses.

Jim

On Tue, Sep 15, 2015 at 2:10 PM, Ivy Allen <ivy_allen@fws.gov> wrote:

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Thanks,

Jim

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jim_zelenak@fws.gov

From: [Smith, Tamara](#)
To: [Parkin, Mary](#)
Cc: [Kurt Broderdorp](#); [Bush, Jodi](#); [Heather Bell](#); [Justin Shoemaker](#); [Jonathan Cummings](#); [Bryon Holt](#); [Mark McCollough](#); [Seth Willey](#); [Jim Zelenak](#)
Subject: Re: Hotel Information for SSA meeting
Date: Friday, September 25, 2015 8:43:31 AM

I will also be around to help.

On Mon, Sep 21, 2015 at 9:02 AM, Parkin, Mary <mary_parkin@fws.gov> wrote:

I'm planning on arriving Monday. Will check flights today to confirm a time.

Mary

On Mon, Sep 21, 2015 at 9:20 AM, Kurt Broderdorp <Kurt_Broderdorp@fws.gov> wrote:

I will also be arriving fairly early on Monday, So I can help out with whatever needs done.

Kurt Broderdorp

US Fish and Wildlife Service

(970) 628-7186

From: Bush, Jodi [mailto:jodi_bush@fws.gov]

Sent: Friday, September 18, 2015 9:11 AM

To: Heather Bell; Justin Shoemaker; Tamara Smith; Jonathan Cummings; Mary Parkin; Bryon Holt; Kurt Broderdorp; Mark McCollough; Seth Willey

Cc: Jim Zelenak

Subject: Hotel Information for SSA meeting

Trying to help Jim out with logistics.

Jim expects to be in Minneapolis early on October 12 (no other choice for flights out of Helena) and is departing on Friday, October 16.

It would be useful if Heather, Mary and Jonathan could show up on Monday as well to make sure logistics and everything was ready to go. Thanks everyone! JB

Jodi L. Bush

Field Supervisor

Montana Ecological Services Office

585 Shepard Way, Suite 1

Helena, MT 59601

(406) 449-5225, ext.205

--

Mary Parkin

Endangered Species Recovery Coordinator, Northeast Region

U.S. Fish and Wildlife Service, Hadley, MA

Remotely located in Escalante, Utah:

Mailing address PO Box 637, Escalante, UT 84726

Street address 145 North Center St, Escalante, UT 84726

Phone 617-417-3331

Email mary_parkin@fws.gov

--

Tamara Smith

U.S. Fish and Wildlife Service

Twin Cities Field Office

4101 American Boulevard East

Bloomington, MN 55425

612-725-3548 ext. 2219

612-600-1599 cell

From: [Smith, Tamara](#)
To: [Zelenak, Jim](#)
Subject: Re: Dr. Frelich
Date: Friday, September 25, 2015 8:45:43 AM

Hi Jim - I'm on it.

On Wed, Sep 23, 2015 at 5:19 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi Tam,

Any chance you can contact Dr. Frelich? If not, I will try tomorrow after class. Jodi has given the go-ahead to invite him to the workshop as a presenter on climate change impacts to boreal forests, if he is available and willing/interested.

freli001@umn.edu

612-624-3671

<https://www.forestry.umn.edu/people/lee-e-frelich>

--

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--

Tamara Smith
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4101 American Boulevard East
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612-600-1599 cell

From: [Bush, Jodi](#)
To: [Eric Rickerson](#)
Cc: [Bryon Holt](#)
Subject: Fwd: Lynx Panel
Date: Friday, September 25, 2015 9:02:42 AM

Eric. Wanted to let you know that Penny got back to me on the Lynx representation and we have a commitment from WDFW of Ben Maletzke. Thanks for your help. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

----- Forwarded message -----

From: **Becker, Penny A (DFW)** <Penny.Becker@dfw.wa.gov>
Date: Thu, Sep 24, 2015 at 8:58 AM
Subject: Lynx Panel
To: "jodi_bush@fws.gov" <jodi_bush@fws.gov>
Cc: "Maletzke, Benjamin T (DFW)" <Benjamin.Maletzke@dfw.wa.gov>, "Lewis, Jeffrey C (DFW)" <Jeffrey.Lewis@dfw.wa.gov>

Hi Jodi,

Ben Maletzke will be attending the panel discussion on behalf of Washington.

I understand from our conversation that he will need to bring a 20 min presentation on the state of the science and status of lynx in WA. Thanks for filling in the gaps for logistics and other details for him when you can.

Appreciate your time,

Penny

Penny A. Becker, Ph.D.

Acting Wildlife Diversity Division Manager

Washington Department of Fish and Wildlife

600 Capital Way North

Olympia WA 98501

Office: 360-902-2694

WHATS ON YOUR PLATE?



The purchase of a Personalized License Plate or an Orca or Eagle Background Plate provides important funding for wildlife and habitat conservation in Washington.

Will you support Washington's wildlife?

From: [Ivy Allen \(via Doodle\)](#)
To: jim_zelenak@fws.gov
Subject: NAL Lynx Tribal Call
Date: Friday, September 25, 2015 9:35:15 AM



Hi there,
Ivy Allen (Ivy_Allen@fws.gov) invites you to participate in the Doodle poll "NAL Lynx Tribal Call."

We need to discuss whether we could get one or maybe two tribal representatives to participate as observers at the Lynx SSA Expert Elicitation Workshop we will be holding in Minneapolis Oct. 13-15, and to find out if such representatives might agree to listen and provide information to other tribes in the lynx DPS range.

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office

Participate now



What is Doodle? Doodle is a web service that helps Ivy Allen to find a suitable date for meeting with a group of people. [Learn more about how Doodle works.](#)

You have received this e-mail because "Ivy Allen" has invited you to participate in the Doodle poll "NAL Lynx Tribal Call."

Doodle is also available for iOS and Android.



From: [Smith, Tamara](#)
To: [Bush, Jodi](#)
Subject: Re: lynx SSA workshop WI - contact - got your message
Date: Friday, September 25, 2015 10:02:24 AM

Ok - I'll let you know what I find out. I just left a message with Owen Boyle.

On Fri, Sep 25, 2015 at 9:19 AM, Bush, Jodi <jodi_bush@fws.gov> wrote:

That would be great -thanks. Our Wisconsin reps from the Bureau of Wildlife Mgmt were John Olson, David McFarland and then John White from Bureau of Natural Heritage Conservation. I'm just trying to figure out if they know that he nominated himself and whether Wisc supports it. We don't have room on the panel but I could make him an observer....

I have left messages with Director Hauge and David. Any help you can get me would be great. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
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(406) 449-5225, ext.205

On Fri, Sep 25, 2015 at 7:24 AM, Smith, Tamara <tamara_smith@fws.gov> wrote:

Hi Jodi - I got your message regarding Dr. Nathan Roberts from WI. I am not sure what division he works under so I am unsure who the appropriate person to contact would be. I know Owen Boyle pretty well, and could call him to find out.

Thanks,
Tam

--
Tamara Smith
U.S. Fish and Wildlife Service
Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425
612-725-3548 ext. 2219
612-600-1599 cell

--

Tamara Smith
U.S. Fish and Wildlife Service
Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425

612-725-3548 ext. 2219
612-600-1599 cell

From: [Leslie, Elaine](#)
To: [Bush, Jodi](#)
Subject: Re: Lynx meeting
Date: Friday, September 25, 2015 4:00:26 PM

I think Rick can make it...thanks!

On Fri, Sep 25, 2015 at 3:43 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:

Thanks Leslie. Here is some more information. I realize this is short notice but it would be great if someone from the NPS would be able to attend as an observer. Please give me a call with your questions. I've attached a fact sheet about the SSA process and one with hotel information. Thanks again for your help. JB

The U.S. Fish and Wildlife Service (Service) is conducting a species status assessment (SSA) for the contiguous United States distinct population segment (DPS) of the Canada lynx (*Lynx canadensis*), which is listed as threatened under the Endangered Species Act. As part of the SSA, we are partnering with state and other federal agencies in the range of the lynx DPS to convene a facilitated expert elicitation workshop. The objective of the workshop is to assess the current status of and threats to the various DPS populations and to evaluate the DPS's viability under a range of future threat, habitat condition, and climate scenarios.

In the workshop, we will seek to elicit and distill the knowledge, professional judgments, and opinions of experts most familiar with each of the DPS populations to inform our understanding of lynx status, the nature and magnitude of potential threats, and the likelihood of their future persistence.

The workshop will be held October 13-15, 2015 in Minneapolis, Minnesota. In addition to expert panelists, we have invited participation from other experts (boreal forest ecology, hare population dynamics, climate modeling and projections, and the regulatory environment as it pertains to lynx) who will present information for consideration by the expert panel. A small number of federal and state wildlife managers also will be present to observe the process.

A block of rooms has been reserved at the Crowne Plaza Hotel near the Minneapolis Airport (See Attachment 2 for additional hotel information). The workshop will be held in a conference room at the hotel. We will start at 1pm on Tuesday, October 13 and finish up no later than 5pm on Thursday, October 15. The block of rooms, at the government rate of \$140/night, is being held until September 30. Please call the Crowne Plaza Hotel at 952-854-9000 and reference the USFWS to reserve your room. Please note that the cancellation policy for this hotel is 24 hours prior to check-in.

Jodi L. Bush
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On Fri, Sep 25, 2015 at 3:35 PM, Leslie, Elaine <elaine_leslie@nps.gov> wrote:

Hi Jodi

Thanks so much for your call....I am copying Glenn and Rick on this.....Glenn is the Chief Wildlife Biologist for the NPS and Rick is our senior wildlife biologist who has lots of lynx experience.

We would definitely like to be engaged at the national level and loop the parks in. I understand there is a meeting coming up soon in Minnesota....Glenn and Rick, can you please give Jodi a call and get the details?

Thanks so much Jodi!

Elaine

Jodi: 406 449 5225 x205

Elaine F. Leslie
Chief, Biological Resources
Natural Resource Stewardship and Science
National Park Service
970 267-2135



--

Elaine F. Leslie
Chief, Biological Resources
Natural Resource Stewardship and Science
National Park Service
970 267-2135



From: [McCollough, Mark](#)
To: [Jim Zelenak](#)
Subject: Maine lynx talks for upcoming meeting
Date: Monday, September 28, 2015 8:00:41 AM

Jim: I'm leaving in a few minutes to meet with Erin Simons about new contract work she has done for us on modeling lynx habitat into the future given forestry, budworm scenarios. I want to provide her advice on what to prepare for her talk at the MN meeting. Any thoughts? What is length of her presentation and on which day?

Dan and I want to work today and tomorrow to develop the presentation for Maine. Have you any thoughts on an outline of the basic info that you would like the lynx experts from different units of the DPS to present? I have some ideas, but don't have time to share with you at the moment. Maybe later today. However, with both of our schedules, we really need to have the Maine talk assembled by tomorrow.

Thanks, Mark

--

Mark McCollough, Ph.D.
Endangered Species Specialist
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Phone 207 866-3344 x115
Cell Phone: 207 944-5709
mark_mccollough@fws.gov

From: [Bush, Jodi](#)
To: [Finley, Nancy](#)
Cc: [Glenn Plumb](#); [Leslie, Elaine](#); [Rick Kahn](#)
Subject: Re: Lynx meeting
Date: Monday, September 28, 2015 8:40:20 AM

I'd be happy to get on a conf call and discuss this with you all so you can determine the appropriate person. I'm pretty tied up today but could talk after 2 pm, MTN. JB

Jodi L. Bush
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(406) 449-5225, ext.205

On Mon, Sep 28, 2015 at 6:24 AM, Finley, Nancy <nancy_finley@nps.gov> wrote:
I will see what I can do.

On Sat, Sep 26, 2015 at 3:08 PM, Glenn Plumb <glenn_plumb@nps.gov> wrote:
Hi Nancy,

We want to share this upcoming meeting in Minneapolis. No one from our office is able to attend, and perhaps someone lynx-wise from MWR could represent NPS. Perhaps Mark Romanski? Please feel free to coordinate with Jodi and let us know if MWR may attend and Rick wii be available to discuss before and after. Cheers

Glenn Plumb, PhD
NPS Chief Wildlife Biologist
Biological Resource Mgt Division
glenn_plumb@nps.gov
406-570-1947 cell phone

On Sep 25, 2015, at 3:44 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:

Thanks Leslie. Here is some more information. I realize this is short notice but it would be great if someone from the NPS would be able to attend as an observer. Please give me a call with your questions. I've attached a fact sheet about the SSA process and one with hotel information. Thanks again for your help. JB

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agencies in the range of the lynx DPS to convene a facilitated expert elicitation workshop. The objective of the workshop is to assess the current status of and threats to the various DPS populations and to evaluate the DPS's viability under a range of future threat, habitat condition, and climate scenarios.

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On Fri, Sep 25, 2015 at 3:35 PM, Leslie, Elaine <elaine_leslie@nps.gov> wrote:

Hi Jodi

Thanks so much for your call....I am copying Glenn and Rick on this.....Glenn is the Chief Wildlife Biologist for the NPS and Rick is our senior wildlife biologist who has lots of lynx experience.

We would definitely like to be engaged at the national level and loop the parks in. I understand there is a meeting coming up soon in Minnesota....Glenn and Rick, can you please give Jodi a call and get the details?

Thanks so much Jodi!

Elaine

Jodi: 406 449 5225 x205

Elaine F. Leslie
Chief, Biological Resources
Natural Resource Stewardship and Science
National Park Service
970 267-2135



<SSA Fact Sheet.pdf>

<Attachment 2 - Hotel Information for Lynx SSA Expert Elicitation
Workshop.pdf>

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Nancy Finley
Associate Regional Director
Natural Resource Stewardship and Science
Midwest Region
National Park Service
402-661-1860
402-378-3081 (cell)

From: [McCollough, Mark](#)
To: [Jim Zelenak](#)
Subject: Maine lynx talks for upcoming meeting
Date: Monday, September 28, 2015 10:00:39 AM

Jim: I'm leaving in a few minutes to meet with Erin Simons about new contract work she has done for us on modeling lynx habitat into the future given forestry, budworm scenarios. I want to provide her advice on what to prepare for her talk at the MN meeting. Any thoughts? What is length of her presentation and on which day?

Dan and I want to work today and tomorrow to develop the presentation for Maine. Have you any thoughts on an outline of the basic info that you would like the lynx experts from different units of the DPS to present? I have some ideas, but don't have time to share with you at the moment. Maybe later today. However, with both of our schedules, we really need to have the Maine talk assembled by tomorrow.

Thanks, Mark

--

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mark_mccollough@fws.gov

From: [McCollough, Mark](#)
To: [Zelenak, Jim](#)
Subject: Re: trapping settlement in MT
Date: Monday, September 28, 2015 10:08:22 AM

Thanks Jim. I didn't see any requirement for incidental take coverage/HCP? Mark

On Wed, Sep 23, 2015 at 9:40 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi Mark,

Thought this might be of interest.

http://helenair.com/news/state-and-regional/judge-approves-deal-that-tightens-trapping-to-protect-lynx/article_e39f2de5-6c6f-5b70-b595-957eb7146342.html

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mark_mccollough@fws.gov

From: [Parkin, Mary](#)
To: [Bell, Heather](#)
Cc: [Jim Zelenak](#); [Moyer, Greg](#)
Subject: Re: question about the expert materials....
Date: Monday, September 28, 2015 1:14:42 PM

oops, hit send too soon. What I meant to say is that sending the same email to all makes the most sense to me, but if you think we need to tailor the package, that's fine with me, too.

On Mon, Sep 28, 2015 at 3:12 PM, Parkin, Mary <mary_parkin@fws.gov> wrote:

I vote for the latter

On Mon, Sep 28, 2015 at 2:15 PM, Bell, Heather <heather_bell@fws.gov> wrote:

do we wend the same thing out to everyone participating? seems like even the observers need to know about the agenda/ roles, etc. or should we tailor an email to observers. what about the threat experts?

easiest is one email, perhaps with a note saying everyone needs to read the ground rules.

the other are critical for the species experts to read, but others may find them informative?

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
Lakewood, CO 80228
303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google
Site: <https://sites.google.com/a/fws.gov/rev/>

--

Mary Parkin
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Mary Parkin

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Street address 145 North Center St, Escalante, UT 84726
Phone 617-417-3331
Email mary_parkin@fws.gov*

From: [Parkin, Mary](#)
To: [McCollough, Mark](#)
Cc: [Jim Zelenak](#); [Dan Harrison](#); [Erin Simons-Legaard](#)
Subject: Re: Outline for state presentations at lynx meeting
Date: Monday, September 28, 2015 2:04:01 PM

Pending Jim's response, this looks good to me, Mark.,

In general, we need to know how the status of lynx and its habitat in Maine/the Northeast has changed over time, what has influenced those changes, and what may continue or emerge to influence the future status of the northeastern population. Dan may want to cover factors that have led to the current population/habitat status, while Erin could focus on continuing and emerging threats. Just a thought.

We also need to know what, if anything, may differentiate the northeastern population from the rest of the DPS, and we need to be clear about which aspects of Maine lynx/hare population dynamics and ecology (and threats) are important but poorly understood. I'd prefer that both these considerations be an explicit part of the presentation. Again, that's my thought pending Jim's input.

No matter what, there will be a lot to cover in not a lot of time, so we really do need focused presentations. Whatever outline we can provide Dan will become a template for the other presenters, so I'm glad you brought this up now!

Mary

On Mon, Sep 28, 2015 at 3:17 PM, McCollough, Mark <mark_mccollough@fws.gov> wrote:
Jim:

I realize now that you are traveling today, so maybe you will not see my emails until you get back to Helena. But, if by chance you do see this email and you have time, could you please provide your thoughts. Mary, any thoughts you have on an outline for presentations would be welcomed. Otherwise, I will be on the lynx conference call tomorrow to discuss.

Dan Harrison has a limited window (Tuesday and Wednesday) of this week to develop the Maine presentation. I assume the state summaries will only be about 20 minutes. Jim, you mentioned that you would like all the state presenters to use a similar outline in their presentations, so we all begin the expert elicitation process with the same understanding of hare and lynx ecology. Here is my best guess of what we would present for Maine:

1. History - very brief discussion of past lynx abundance and distribution, disturbance that created habitat, factors that affected populations
2. Current status of lynx - abundance and density (if known), distribution, key habitat needs, models predicting distribution, probability of occurrence, relationship/connectivity to populations in Canada and adjacent states, diet

3. Current status of hares - populations, density, cycles? fluctuations?; critical landscape hare density;
4. Effects of hare fluctuations on lynx populations - home range, movements, reproduction
5. Factors affecting lynx and hare habitat and populations
 - forest management and ownership - budworm-era management, Maine Forest Practices Act, current forest management, land ownership and trends
 - hare cycles/fluctuations - monitoring, evidence for cycles/fluctuations, effects on lynx reproduction, survival, home range, movements
 - competition/hybridization with bobcats and other predators
 - climate change - snow depth, quality, duration; thresholds
 - anthropogenic effects - trapping, road mortality, illegal shooting
 - development - Plum Creek, Irving; wind power, East-West highway

The last section may be more of the topics that you would like our advisor/threat experts (Erin Simons-Legaard) to cover. Dan could cover these in general, but Erin has much more detailed information on many of these. Please advise.

Any other topics that you want Dan to cover?

thanks, Mark

--

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Street address 145 North Center St, Escalante, UT 84726
Phone 617-417-3331
Email mary_parkin@fws.gov

From: Kaimy Marks
To: [McCollough, Mark](#); [Shay White](#); [Laury Zicari](#)
Subject: RE: Funding for lynx expert meeting - MAINE invitational travelers
Date: Monday, September 28, 2015 2:08:02 PM

Thanks Mark-

I did hear from Erin today and was granted access to her profile in Concur so I will book her flight and we will cover her expenses.

I also received a request from Jennifer Vashon on Friday, so we will pay for her travel as well.

Kaimy

From: McCollough, Mark [mailto:mark_mccollough@fws.gov]
Sent: Monday, September 28, 2015 10:19 AM
To: Kaimy Marks; Shay White; Laury Zicari
Subject: Re: Funding for lynx expert meeting - MAINE invitational travelers

Kaimy:

I just met with Erin Simons-Legaard at UMaine. We have her signed up in Concur as an Invitational Traveler. She will be calling you shortly to arrange for flight, hotel, and other expenses. If possible, we would like your office to pay for expenses.

Dan Harrison and Jen Vashon have said that they will pay their own way to the lynx expert meeting in MN.

Thanks, Mark McCollough

On Thu, Sep 24, 2015 at 3:45 PM, Kaimy Marks <kaimy_marks@fws.gov> wrote:
Hi Mark-

Just checking/confirming – were you able to get Erin Simons set up as an invitational traveler and take care of her for this meeting?

And Dan Harrison and Jennifer Vashon will **NOT** need travel assistance?

Please let me know, don't want to assume anything and drop the ball!

Kaimy Marks
Administrative Support Assistant
U.S. Fish & Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1, Helena, MT 59601
406-449-5225 X207

From: McCollough, Mark [mailto:mark_mccollough@fws.gov]
Sent: Wednesday, August 26, 2015 8:43 AM
To: Zelenak, Jim

Cc: Laury Zicari; Sharon Hooley; Kaimy Marks; Jodi Bush
Subject: Re: Funding for lynx expert meeting

Jim et al:

I believe only Erin Simons from Maine needs travel assistance to MN. We have funds here that we could apply to Erin's travel. We are having her fill out Invitational Travel forms today to get her into the Concur system before it closes for the end of the fiscal year. We cannot proceed further in Concur with Travel Authorization, etc. until we have further logistic info for the upcoming meeting.

Any thoughts, concerns?

thanks, Mark McCollough

On Wed, Aug 26, 2015 at 10:35 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:
Thanks Mark and Laury.

I've copied Jodi and our Administrative Experts here. I'm guessing any help will be welcomed, but will let Sharon or Kaimy reply if they foresee any issues/difficulties with the Maine Field Office paying travel and lodging costs for non-USFWS Maine participants in the Lynx SSA Expert Elicitation Workshop in Minneapolis in mid-Oct.

On Tue, Aug 25, 2015 at 1:07 PM, McCollough, Mark <mark_mccollough@fws.gov> wrote:
Jim: I just talked to Laury about our call today and sent an email to our three potential invitees from Maine. We have some end-of-year funds that we would like to use. I reminded the Maine invitees that we are still planning the Oct 13-15 meeting and that if they need help with funding to let our field office know by Friday. Laury supports obligating funds for airfare and hotel for the three from Maine (perhaps they could cover their per diem?), if needed.

Is this OK with you folks???

Mark

--

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From: [Kaimy Marks](#)
To: [Jodi Bush](#); [Jim Zelenak](#)
Cc: [Sharon Hooley](#)
Subject: FW: Funding for lynx expert meeting - MAINE invitational travelers
Date: Monday, September 28, 2015 2:27:20 PM

Jodi/Jim-

Looks like we are paying for Erin Simons-Legaard's travel after all. She contacted me today about flights and said she has an email into Jim to ask what the expectation is for her to be present/available after presenting? She's willing/able to stay until the end, but wasn't sure she would be needed for the whole thing. Does this make sense?

Also- Mark indicated below that Jen Vashon would be paying her own expenses, but she did send in a form Friday asking for us to cover her expenses, which I assume we will. Please let me know if not. I have not heard from Dan Harrison.

Kaimy

From: McCollough, Mark [mailto:mark_mccollough@fws.gov]
Sent: Monday, September 28, 2015 10:19 AM
To: Kaimy Marks; Shay White; Laury Zicari
Subject: Re: Funding for lynx expert meeting - MAINE invitational travelers

Kaimy:

I just met with Erin Simons-Legaard at UMaine. We have her signed up in Concur as an Invitational Traveler. She will be calling you shortly to arrange for flight, hotel, and other expenses. If possible, we would like your office to pay for expenses.

Dan Harrison and Jen Vashon have said that they will pay their own way to the lynx expert meeting in MN.

Thanks, Mark McCollough

On Thu, Sep 24, 2015 at 3:45 PM, Kaimy Marks <kaimy_marks@fws.gov> wrote:
Hi Mark-

Just checking/confirming – were you able to get Erin Simons set up as an invitational traveler and take care of her for this meeting?

And Dan Harrison and Jennifer Vashon will **NOT** need travel assistance?

Please let me know, don't want to assume anything and drop the ball!

Kaimy Marks
Administrative Support Assistant
U.S. Fish & Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1, Helena, MT 59601

From: McCollough, Mark [mailto:mark_mccollough@fws.gov]
Sent: Wednesday, August 26, 2015 8:43 AM
To: Zelenak, Jim
Cc: Laury Zicari; Sharon Hooley; Kaimy Marks; Jodi Bush
Subject: Re: Funding for lynx expert meeting

Jim et al:

I believe only Erin Simons from Maine needs travel assistance to MN. We have funds here that we could apply to Erin's travel. We are having her fill out Invitational Travel forms today to get her into the Concur system before it closes for the end of the fiscal year. We cannot proceed further in Concur with Travel Authorization, etc. until we have further logistic info for the upcoming meeting.

Any thoughts, concerns?

thanks, Mark McCollough

On Wed, Aug 26, 2015 at 10:35 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:
Thanks Mark and Laury.

I've copied Jodi and our Administrative Experts here. I'm guessing any help will be welcomed, but will let Sharon or Kaimy reply if they foresee any issues/difficulties with the Maine Field Office paying travel and lodging costs for non-USFWS Maine participants in the Lynx SSA Expert Elicitation Workshop in Minneapolis in mid-Oct.

On Tue, Aug 25, 2015 at 1:07 PM, McCollough, Mark <mark_mccollough@fws.gov> wrote:
Jim: I just talked to Laury about our call today and sent an email to our three potential invitees from Maine. We have some end-of-year funds that we would like to use. I reminded the Maine invitees that we are still planning the Oct 13-15 meeting and that if they need help with funding to let our field office know by Friday. Laury supports obligating funds for airfare and hotel for the three from Maine (perhaps they could cover their per diem?), if needed.

Is this OK with you folks???

Mark

--
Mark McCollough, Ph.D.
Endangered Species Specialist
Maine Field Office
U. S. Fish and Wildlife Service
17 Godfrey Drive, Suite 2
Orono, ME 04473
Phone 207 866-3344 x115
Cell Phone: 207 944-5709

mark_mccollough@fws.gov

--

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jim_zelenak@fws.gov

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mark_mccollough@fws.gov

From: [Parkin, Mary](#)
To: [Cummings, Jonathan](#)
Cc: [Heather Bell](#); [Jim Zelenak](#)
Subject: Re: Cardinal SSA questions
Date: Monday, September 28, 2015 2:58:50 PM

The one you're looking at, with the latest comments being Tam's from July 16, looks right to me, Jonathan. Thanks, because I've now pulled it up to complete my assignment for the day!

On Mon, Sep 28, 2015 at 4:53 PM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:

As some background prep I was going to look at the cardinal SSA questions. There are two versions on the Lynx SSA google drive, are they the same, or is there a newer one I should look at? Based on the comments one seems newer, but I'd like to make sure I'm picking the one that's up to date.

Cheers,
Jonathan

--

Jonathan W. Cummings, PhD
Research Ecologist
USGS - Leetown Science Center (remotely located)
jwcummings@usgs.gov

Remote Contact Info:
802-999-8684 - cell
243 Locust St
Dover, NH 03820

--

Mary Parkin
Endangered Species Recovery Coordinator, Northeast Region
U.S. Fish and Wildlife Service, Hadley, MA
Remotely located in Escalante, Utah:
Mailing address PO Box 637, Escalante, UT 84726
Street address 145 North Center St, Escalante, UT 84726
Phone 617-417-3331
Email mary_parkin@fws.gov

From: [McCollough, Mark](#)
To: [Jim Zelenak](#); [Mary Parkin](#)
Cc: [Dan Harrison](#); [Erin Simons-Legaard](#)
Subject: Outline for state presentations at lynx meeting
Date: Monday, September 28, 2015 3:17:57 PM

Jim:

I realize now that you are traveling today, so maybe you will not see my emails until you get back to Helena. But, if by chance you do see this email and you have time, could you please provide your thoughts. Mary, any thoughts you have on an outline for presentations would be welcomed. Otherwise, I will be on the lynx conference call tomorrow to discuss.

Dan Harrison has a limited window (Tuesday and Wednesday) of this week to develop the Maine presentation. I assume the state summaries will only be about 20 minutes. Jim, you mentioned that you would like all the state presenters to use a similar outline in their presentations, so we all begin the expert elicitation process with the same understanding of hare and lynx ecology. Here is my best guess of what we would present for Maine:

1. History - very brief discussion of past lynx abundance and distribution, disturbance that created habitat, factors that affected populations
2. Current status of lynx - abundance and density (if known), distribution, key habitat needs, models predicting distribution, probability of occurrence, relationship/connectivity to populations in Canada and adjacent states, diet
3. Current status of hares - populations, density, cycles? fluctuations?; critical landscape hare density;
4. Effects of hare fluctuations on lynx populations - home range, movements, reproduction
5. Factors affecting lynx and hare habitat and populations
 - forest management and ownership - budworm-era management, Maine Forest Practices Act, current forest management, land ownership and trends
 - hare cycles/fluctuations - monitoring, evidence for cycles/fluctuations, effects on lynx reproduction, survival, home range, movements
 - competition/hybridization with bobcats and other predators
 - climate change - snow depth, quality, duration; thresholds
 - anthropogenic effects - trapping, road mortality, illegal shooting
 - development - Plum Creek, Irving; wind power, East-West highway

The last section may be more of the topics that you would like our advisor/threat experts (Erin Simons-Legaard) to cover. Dan could cover these in general, but Erin has much more detailed information on many of these. Please advise.

Any other topics that you want Dan to cover?

thanks, Mark

--

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Phone 207 866-3344 x115
Cell Phone: 207 944-5709
mark_mccollough@fws.gov

From: [McCollough, Mark](#)
To: [Kaimy Marks](#)
Subject: Re: Funding for lynx expert meeting - MAINE invitational travelers
Date: Monday, September 28, 2015 4:31:36 PM

Thank you. Mark

On Mon, Sep 28, 2015 at 4:07 PM, Kaimy Marks <kaimy_marks@fws.gov> wrote:

Thanks Mark-

I did hear from Erin today and was granted access to her profile in Concur so I will book her flight and we will cover her expenses.

I also received a request from Jennifer Vashon on Friday, so we will pay for her travel as well.

Kaimy

From: McCollough, Mark [mailto:mark_mccollough@fws.gov]
Sent: Monday, September 28, 2015 10:19 AM
To: Kaimy Marks; Shay White; Laury Zicari
Subject: Re: Funding for lynx expert meeting - MAINE invitational travelers

Kaimy:

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Kaimy Marks

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Sent: Wednesday, August 26, 2015 8:43 AM

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Subject: Re: Funding for lynx expert meeting

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Is this OK with you folks???

Mark

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From: [Ratnaswamy, Mary](#)
To: [Alexej Siren](#)
Cc: [Bush, Jodi](#); [Toni Lyn Morelli](#); [Addie Rose Holland](#); [Jim Zelenak](#); [Kaimy Marks](#)
Subject: Re: Lynx and SSA background
Date: Monday, September 28, 2015 6:28:15 PM

Good evening everyone,

This is really great news and so glad we can contribute!

I will catch up with Alexei and Toni Lyn this week,

Thanks all,
Mary

On Mon, Sep 28, 2015 at 5:17 PM, Alexej Siren <asiren@umass.edu> wrote:

Hello Jodi,

I'm happy to be on board and look forward to the meeting in Minneapolis. I will fax the FBMS vendor request to you tomorrow. It may be easier for me to scan the form and email it back to you. Is that an option? Also, I assume that I should make a room reservation now? I noticed that the cutoff date was tomorrow.

Thanks again and I look forward to meeting you soon.

Alexej

From: Bush, Jodi [mailto:jodi_bush@fws.gov]
Sent: Monday, September 28, 2015 3:39 PM
To: Toni Lyn Morelli <morelli@umass.edu>
Cc: asiren <asiren@umass.edu>; Mary Ratnaswamy <mratnaswamy@usgs.gov>; Addie Rose Holland <aholland@geo.umass.edu>; Jim Zelenak <jim_zelenak@fws.gov>; Kaimy Marks <kaimy_marks@fws.gov>
Subject: Re: Lynx and SSA background

Thanks Toni. We are glad to have Alexej involved. Please see attached for information about the process. I will have Jim Zelenak (our Service lead) reach out to him later this week. In the meantime, please have him fill out the attached paperwork (there are contacts if he has questions) and we will get the travel arrangements moving. JB

Jodi L. Bush

Field Supervisor

Montana Ecological Services Office

585 Shepard Way, Suite 1

Helena, MT 59601

(406) 449-5225, ext.205

On Mon, Sep 28, 2015 at 2:31 PM, Toni Lyn Morelli <morelli@umass.edu> wrote:

Good afternoon Jodi,

We at the Climate Science Centers are happy to hear that we can help support the lynx SSA process. Our NE CSC Fellow Alexej Siren (copied here, along with our Director and Program Manager) is planning to attend the meeting in Minneapolis and could provide information on snow cover changes, as well as population information from his many years of research on lynx and snowshoe hare in the northeast. I'll let him follow up with you directly to discuss what kind of presentation you might be looking for.

In the meantime, I understand that there are funds available from FWS to support Alexej's flight, hotel, and per diem. Again, Alexej will follow up with Shannon as he didn't yet receive the FBMS Vendor Request Form.

Happy to have made this connection,

Toni Lyn

Toni Lyn Morelli
USGS Research Ecologist, DOI Northeast Climate Science Center
Adjunct Assistant Professor, Department of Environmental Conservation

University of Massachusetts
134 Morrill Science Center, Amherst MA 01003

Office: 413-545-2515 Mobile: 313-919-0191
tmorelli@usgs.gov
necsc.umass.edu/people/Toni-Lyn-Morelli

----- Forwarded message -----

From: **Bush, Jodi** <jodi_bush@fws.gov>
Date: Fri, Sep 25, 2015 at 10:52 AM
Subject: Lynx and SSA background
To: Robin O'Malley <romalley@usgs.gov>
Cc: Jim Zelenak <jim_zelenak@fws.gov>

Hi Robin. Here is some more information for you regarding the SSA process and where we are headed. I've also attached the letter we are sending to presenters which has a little more information in it for your use. I've also provided the hotel information because it is getting close. Please give me a call if you have any questions at all or send me an email. Thanks for your help. JB

Jodi L. Bush

Field Supervisor

Montana Ecological Services Office

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(406) 449-5225, ext.205

Mary Ratnaswamy, Ph.D.
Director, DOI Northeast Climate Science Center
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136 Morrill Science Center (office)
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<https://nccwsc.usgs.gov>

<http://necsc.umass.edu>

<http://www.doi.gov/csc/northeast/index.cfm>

Join our Mailing List (<https://necsc.umass.edu/content/join-our-mailing-list>)

From: [Google Calendar](#)
To: kurt_broderdorp@fws.gov; jwcummings@usgs.gov; tamara_smith@fws.gov; mark_mccollough@fws.gov; seth_willey@fws.gov; bryon_holt@fws.gov; jim_zelenak@fws.gov; heather_bell@fws.gov; mary_parkin@fws.gov
Cc: seth_willey@fws.gov; kurt_broderdorp@fws.gov; heather_bell@fws.gov; bryon_holt@fws.gov; jwcummings@usgs.gov; mark_mccollough@fws.gov; tamara_smith@fws.gov; jim_zelenak@fws.gov
Subject: [Update] lynx core team call, 10-11 MDT
Date: Tuesday, September 29, 2015 8:30:39 AM

Hi all,

This is a reminder of the core team call today -- please join in!

Our main agenda topic is to pull together a list of sample questions for the experts. We're sending them a package of materials this week to prepare for the meeting, and these questions will be included. We'll also discuss an outline to give the regional presenters regarding the types of information we'd like each of them to present.

lynx core team call, 10-11 MDT

1. Join the Webex meeting:

<http://www.mymeetings.com/nc/join.php?sigKey=mymeetings&i=745099055&p=&t=c>

If using Google Chrome, I suggest copying the link and pasting it into Explorer.

2. Enter the required fields.
3. Indicate that you have read the Privacy Policy.
4. Click on Proceed.

When Tue Sep 29, 2015 12pm – 1pm Eastern Time

Where Phone 877-501-8335 Passcode 9984367 ([map](#))

Who

- mary_parkin@fws.gov - organizer
- heather_bell@fws.gov
- mark_mccollough@fws.gov
- tamara_smith@fws.gov
- seth_willey@fws.gov
- bryon_holt@fws.gov
- jim_zelenak@fws.gov
- jwcummings@usgs.gov
- kurt_broderdorp@fws.gov

From: [Hooley, Sharon](#)
To: [Kaimy Marks](#)
Cc: [Jim Zelenak](#); [Heather Bell](#); [Jonathan Cummings](#); [Jodi Bush](#)
Subject: Re: Lynx Travel
Date: Tuesday, September 29, 2015 10:02:19 AM

Good morning, just to add, that normally we do an IAA before the travel date, however because of the year-end blackout period with FBMS it will be put into the system after the fact.

I will be working with Kaimy to get the hard copy IAA completed and signed so we are ready to complete the process when FBMS opens.

Thanks,

Sharon

Sharon Hooley
Administrative Officer
MT ES Office
585 Shepard Way
Helena, MT 59601

On Tue, Sep 29, 2015 at 9:57 AM, Kaimy Marks <kaimy_marks@fws.gov> wrote:

All-

I clarified with Sharon this morning – because Jonathan is a DOI employee, his travel should be booked as normal through USGS and we will set up an intra-agency agreement after his return to reimburse USGS directly.

This will be the easiest method for us to pay for his travel - please let me know if there are additional questions.

Thanks!

Kaimy Marks

Administrative Support Assistant

U.S. Fish & Wildlife Service

Montana Ecological Services Office

585 Shepard Way, Suite 1, Helena, MT 59601

406-449-5225 X207

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Tuesday, September 29, 2015 9:54 AM
To: Bell, Heather
Cc: Cummings, Jonathan; Kaimy Marks; Jodi Bush
Subject: Re: Lynx Travel

Yes - that was my understanding, too.

I'm copying Kaimy Marks, our admin wizard, who has been a great help with travel arrangements for other attendees - please contact her if you have travel questions and definitely before you book airfare.

let me know if you need other.

Jim

On Mon, Sep 28, 2015 at 7:31 AM, Bell, Heather <heather_bell@fws.gov> wrote:

Jim, let me clarify. Jonathan is asking for you to pay for his travel, which i believe we agreed to. You will just need to give him an accounting code i believe.

Heather Bell

Ecological Services HQ

Branch of Conservation Integration

SSA Framework Team Lead

Remotely Located at

134 S. Union Blvd

Lakewood, CO 80228

303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google
Site: <https://sites.google.com/a/fws.gov/rev/>

On Thu, Sep 24, 2015 at 4:17 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

I will forward the info we sent to the lynx experts - it should have what you need.

On Thu, Sep 24, 2015 at 2:47 PM, Bell, Heather <heather_bell@fws.gov> wrote:

Jonathan, i think Jim is who you need to talk to...Jim, if this comes as a surprise punt it back to me....i can't remember whom i have told what to when!

Heather Bell

Ecological Services HQ

Branch of Conservation Integration

SSA Framework Team Lead

Remotely Located at

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Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google
Site: <https://sites.google.com/a/fws.gov/rev/>

On Thu, Sep 24, 2015 at 2:00 PM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:

Hi Heather,

I'm putting together a travel request for the Lynx SSA, and Dave told me that FWS is covering that travel. Just want to make sure that's correct, and if so how I should arrange that. I've attached the usual travel request form for my travels.

Cheers,

Jonathan

--

Jonathan W. Cummings, PhD

Research Ecologist

USGS - Leetown Science Center (remotely located)

jwcummings@usgs.gov

Remote Contact Info:

802-999-8684 - cell

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From: [Cummings, Jonathan](mailto:Cummings.Jonathan)
To: [Parkin, Mary](mailto:Parkin.Mary)
Cc: [Bell, Heather](mailto:Heather.Bell); [Jim Zelenak](mailto:Jim.Zelenak)
Subject: Re: tomorrow's modeling call
Date: Tuesday, September 29, 2015 12:02:55 PM

Let's start with right after the state call tomorrow (4-5 pm ET), and if we need more time during the Thursday or Friday slots I can do that too.

On Tue, Sep 29, 2015 at 1:53 PM, Parkin, Mary <mary_parkin@fws.gov> wrote:

What about talking right after tomorrow's State coordination call, at 4 ET? That's late for you, Jonathan, so if sometime on Thursday -- anytime after 11 am ET -- would work better, or anytime on Friday, I'm open.

thanks,
Mary

On Tue, Sep 29, 2015 at 1:50 PM, Bell, Heather <heather_bell@fws.gov> wrote:

lets reschedule!

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
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Check it out! SSA Framework - Google Site for Staff
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Site: <https://sites.google.com/a/fws.gov/rev/>

On Tue, Sep 29, 2015 at 11:49 AM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:

My schedule is open the rest of the week, so if it is best to include Mary and reschedule tomorrow's modeling call, I can do that. Or we can keep the call as is, just let me know.

On Tue, Sep 29, 2015 at 1:40 PM, Parkin, Mary <mary_parkin@fws.gov> wrote:

Hi both,

These are the days of apologies! I had an RDT briefing before the lynx call that was unrelentless and went overtime. Heather, I guess we tag-teamed it this time around, and many thanks, Jonathan, for making the whole call.

FYI Heather, the call had measurable results! Jim et al. are getting the packet together, and the core team will provide their feedback on the questions and CM by COB today.

If you guys go ahead with tomorrow morning's call as scheduled, I'll call one of you

later in the day to catch up. I do plan to be on the afternoon call with the States, but Jim made it sound like that would be short and sweet.

Cheers,
Mary

On Tue, Sep 29, 2015 at 12:10 PM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:

Lynx call now, are you joining?

On Tue, Sep 29, 2015 at 10:57 AM, Parkin, Mary <mary_parkin@fws.gov> wrote:

Hi all,

I'm so sorry, but I won't be able to make tomorrow's modeling call. My sister just learned that she has cancer, and, as she's blind, she needs help getting to medical appointments -- this has become my responsibility. It turns out her first appointment to discuss treatment options has been set for the same time as our call.

I encourage you to go ahead, and I can get a download from one of you. Or, other than the state coordination call tomorrow (I should back at my desk by then) and one other call first thing Thursday morning -- assuming no shutdown -- I could do it at any other time.

Again, my apologies,
Mary

--

Mary Parkin
Endangered Species Recovery Coordinator, Northeast Region
U.S. Fish and Wildlife Service, Hadley, MA
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From: [Ivan - DNR, Jake](#)
To: [Zelenak, Jim](#)
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Tuesday, September 29, 2015 12:41:40 PM

Hi Jim,

John mentioned that he was giving a presentation in Minneapolis and wondered if he or I should talk about the lynx-bark beetle work going on in Colorado (he and I are collaborating on the project). He thought it might fit better in my presentation about Colorado. However, unless I missed it (which is possible since I missed the whole travel thing when I scanned the original letter!) I don't see that I am on the docket for giving any kind of presentation about lynx in Colorado. Am I? Based on our previous conversations, I'm expecting to be asked a series of questions and to provide information/opinions/judgments, but not present anything. Let me know.

Jake

Jake Ivan
Wildlife Researcher
Mammals Research Section



P 970.472.4310 | F 970.472.4457 | C 970.556.8048
317 W. Prospect Rd., Fort Collins, CO 80526
jake.ivan@state.co.us | cpw.state.co.us

On Fri, Sep 18, 2015 at 3:45 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi Jake,

We will cover your travel - it should be explained in the letter. I've copied our Administrative Officer, Sharon Hooley, who can help out - her number is also in the letter.

As I understand it, we can purchase plane tickets up front, but can only reimburse lodging and per diem (meal) expenses later (within a week or two of the workshop, and to do that, we will need you to complete the invitational traveler form that accompanied the letter and my earlier email and fax it back to Sharon here.

Let me know if you have any trouble getting it lined up. I'm away next week but will be checking emails. If you'd like to talk, my cell is [907-978-0734](tel:907-978-0734).

Have a great weekend.

On Fri, Sep 18, 2015 at 3:37 PM, Ivan - DNR, Jake <jake.ivan@state.co.us> wrote:

Hi Jim,

What's the situation with travel assistance? I currently have approval to go at no cost to the State. I got denied approval otherwise with my initial request. I could try again and see if that changes but I don't know that it will.

Jake

Jake Ivan
Wildlife Researcher
Mammals Research Section



P [970.472.4310](tel:970.472.4310) | F [970.472.4457](tel:970.472.4457) | C [970.556.8048](tel:970.556.8048)
317 W. Prospect Rd., Fort Collins, CO 80526
jake.ivan@state.co.us | cpw.state.co.us

On Fri, Sep 18, 2015 at 12:45 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi All:

Please see the attached invitation to participate as lynx expert panelists at the Oct. 13-15 Lynx SSA Expert Elicitation Workshop in Minneapolis, along with the hotel information and invitational traveler form (both also attached).

You are among the group of experts most familiar with the lynx populations in the contiguous U.S. and southern Canada and who we believe can make the greatest contribution to our understanding of the status of, threats to, and future viability of those populations.

Because we needed to keep the panel to a manageable number (10-12) while also getting representation from across the range of the DPS, there are other lynx researchers and experts (your peers) who we were unable to invite to participate as panelists. We hope some of those will nonetheless attend the workshop and present their research results for you on the expert panel to consider.

I hope you are still interested and available to participate as an expert panelist. If you are unable to attend, please let me know at your earliest convenience.

The workshop facilitators and I will be in touch over the coming weeks to provide additional information on the structured process for the workshop and other details.

Please email or call me if you have any questions, and thanks again for your willingness to participate on this panel.

Cheers!

Jim

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
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 [\(406\) 449-5225 ext. 220](tel:(406)449-5225)
jim_zelenak@fws.gov

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jim_zelenak@fws.gov

From: [Heather Bell](#)
To: [Parkin, Mary](#)
Cc: [Cummings, Jonathan](#); [Jim Zelenak](#)
Subject: Re: tomorrow"s modeling call
Date: Tuesday, September 29, 2015 1:29:50 PM

That works for me

Not responsible for this phones interpretation of my word usage or typing skills! Sent from my iPhone

From: [Zelenak, Jim](#)
To: [Mark McCollough](#); [Tamara Smith](#); [Bryon Holt](#); [Kurt Broderdorp](#)
Cc: [Mary Parkin](#); [Heather Bell](#); [Seth Willey](#); [Jonathan Cummings](#); [Kurt Johnson](#); [Jodi Bush](#)
Subject: Fwd: Lynx and SSA background
Date: Tuesday, September 29, 2015 1:49:10 PM

Hi All,

Jodi worked with Robin O' Malley and Toni Lyn Morelli at USGS Climate Science Centers to arrange for Alexej Siren with Umass and the Northeast Climate Science Center to attend the workshop and present the current state of the science with regard to snow modeling.

See trail below.

I will reach out to Alexej soon to discuss our needs.

----- Forwarded message -----

From: **Jodi Bush** <jodi_bush@fws.gov>
Date: Tue, Sep 29, 2015 at 7:44 AM
Subject: Re: Lynx and SSA background
To: Alexej Siren <asiren@umass.edu>
Cc: Kaimy Marks <kaimy_marks@fws.gov>, Jim Zelenak <jim_zelenak@fws.gov>

Alexej. We are glad to have you. Please give Kaimy Marks a call at 406.449.5225, x207 and she can walk you thru it. I am out of office next couple of days. Thanks. JB

Sent from my iPhone

On Sep 28, 2015, at 3:17 PM, Alexej Siren <asiren@umass.edu> wrote:

Hello Jodi,

I'm happy to be on board and look forward to the meeting in Minneapolis. I will fax the FBMS vendor request to you tomorrow. It may be easier for me to scan the form and email it back to you. Is that an option? Also, I assume that I should make a room reservation now? I noticed that the cutoff date was tomorrow.

Thanks again and I look forward to meeting you soon.

Alexej

From: Bush, Jodi [mailto:jodi_bush@fws.gov]
Sent: Monday, September 28, 2015 3:39 PM
To: Toni Lyn Morelli <morelli@umass.edu>
Cc: asiren <asiren@umass.edu>; Mary Ratnaswamy <mratnaswamy@usgs.gov>; Addie Rose Holland <aholland@geo.umass.edu>; Jim Zelenak <jim_zelenak@fws.gov>; Kaimy Marks <kaimy_marks@fws.gov>
Subject: Re: Lynx and SSA background

Thanks Toni. We are glad to have Alexej involved. Please see attached for information about the process. I will have Jim Zelenak (our Service lead) reach out to him later this week. In the meantime, please have him fill out the attached paperwork (there are contacts if he has questions) and we will get the travel arrangements moving. JB

Jodi L. Bush

Field Supervisor

Montana Ecological Services Office

585 Shepard Way, Suite 1

Helena, MT 59601

(406) 449-5225, ext.205

On Mon, Sep 28, 2015 at 2:31 PM, Toni Lyn Morelli <morelli@umass.edu> wrote:

Good afternoon Jodi,

We at the Climate Science Centers are happy to hear that we can help support the lynx SSA process. Our NE CSC Fellow Alexej Siren (copied here, along with our Director and Program Manager) is planning to attend the meeting in Minneapolis and could provide information on snow cover changes, as well as population information from his many years of research on lynx and snowshoe hare in the northeast. I'll let him follow up with you directly to discuss what kind of presentation you might be looking for.

In the meantime, I understand that there are funds available from FWS to support

Alexej's flight, hotel, and per diem. Again, Alexej will follow up with Shannon as he didn't yet receive the FBMS Vendor Request Form.

Happy to have made this connection,

Toni Lyn

Toni Lyn Morelli
USGS Research Ecologist, DOI Northeast Climate Science Center
Adjunct Assistant Professor, Department of Environmental Conservation

University of Massachusetts
134 Morrill Science Center, Amherst MA 01003

Office: 413-545-2515 Mobile: 313-919-0191
tmorelli@usgs.gov
necsc.umass.edu/people/Toni-Lyn-Morelli

----- Forwarded message -----
From: **Bush, Jodi** <jodi_bush@fws.gov>
Date: Fri, Sep 25, 2015 at 10:52 AM
Subject: Lynx and SSA background
To: Robin O'Malley <romalley@usgs.gov>
Cc: Jim Zelenak <jim_zelenak@fws.gov>

Hi Robin. Here is some more information for you regarding the SSA process and where we are headed. I've also attached the letter we are sending to presenters which has a little more information in it for your use. I've also provided the hotel information because it is getting close. Please give me a call if you have any questions at all or send me an email. Thanks for your help. JB

Jodi L. Bush

Field Supervisor

Montana Ecological Services Office

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U.S. Fish and Wildlife Service
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jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Parkin, Mary](#)
Cc: [Cummings, Jonathan](#); [Mark McCollough](#); [Tamara Smith](#); [Bryon Holt](#); [Kurt Broderdorp](#); [Heather Bell](#)
Subject: Re: 3 Rs
Date: Tuesday, September 29, 2015 2:39:16 PM

Thought I had rotated and then re-saved, but apparently that did not work....

On Tue, Sep 29, 2015 at 2:27 PM, Parkin, Mary <mary_parkin@fws.gov> wrote:
I second Jonathan.

On Tue, Sep 29, 2015 at 4:18 PM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:
Thanks, Jim

I think it is important to share this with experts. Having everyone using the same terminology and understanding its meaning in context is always helpful. Oh, and if you can rotate it so that it loads right-side up that would be even better.

Jonathan

On Tue, Sep 29, 2015 at 3:38 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:
Attached is a PDF of the 3 Rs as of Aug. 2015.

Mary let me know if this cross-walks well with the most recent for SSA purposes and whether we should send this one along with other materials to workshop attendees (experts and others).

Thanks.

Jim

--

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Jonathan W. Cummings, PhD
Research Ecologist
USGS - Leetown Science Center (remotely located)
jwcummings@usgs.gov

Remote Contact Info:
802-999-8684 - cell
243 Locust St
Dover, NH 03820

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Mary Parkin
Endangered Species Recovery Coordinator, Northeast Region
U.S. Fish and Wildlife Service, Hadley, MA
Remotely located in Escalante, Utah:
Mailing address PO Box 637, Escalante, UT 84726
Street address 145 North Center St, Escalante, UT 84726
Phone 617-417-3331
Email mary_parkin@fws.gov

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jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [dennis murray](#)
Bcc: [Mary Parkin](#); [Heather Bell](#); [Jodi Bush](#); [Mark McCollough](#); [Tamara Smith](#); [Bryon Holt](#); [Kurt Broderdorp](#); [Jonathan Cummings](#)
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Tuesday, September 29, 2015 3:13:25 PM

Hi Dr. Murray,

I just tried your office phone number and was told that your mail box cannot accept more messages.

Anyway, I wanted to talk to you about the lynx workshop in Minneapolis. Bottom line I guess is that the Fish and Wildlife Service and USGS folks who facilitate these kinds of structured elicitation meetings were really pressing to keep the number of participants to a small and manageable number, while needing to get representation from across the lynx range in the lower 48 and some representation from southern Canadian Provinces. Dr. Bowman expressed his interest and seemed more certain of his availability to attend on the selected dates, so we extended the invitation to him.

After the meeting, we will summarize the discussion and information gleaned and send that around to interested partners, and I'd like to be able to send it your way and get your thoughts. Also, after the status assessment is completed, we will begin recovery planning, and I hope you will consider being involved in that effort.

Feel free to call if you'd like to discuss any of this, and thanks again for your willingness to help us understand status and conservation needs of lynx on the southern periphery of the range.

Jim

On Fri, Sep 25, 2015 at 3:27 PM, dennis murray <dennismurray@trentu.ca> wrote:

Jim,

I am following up on this meeting. My understanding through the grapevine is that the dates have been set. Please advise: 1) If I am still invited; and 2) the precise dates and location. I need to firm up my schedule ASAP, so thanks.

Dennis

Dennis Murray

CRC, Integrative Wildlife Conservation,
Bioinformatics, and Ecological Modeling
Trent University
Peterborough, ON
K9J 7B8

www.dennismurray.ca

On Sep 5, 2015, at 1:06 PM, dennis murray <dennismurray@trentu.ca> wrote:

Jim,

I am about 50% certain that I can attend that week. I need to take time off for teaching the following week to attend the TWS meeting and it might be pushing things a bit to be absent for 2 weeks of lectures. Other weeks might be easier to justify. Anyway, just a thought.

Dennis

Dennis Murray

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Bioinformatics, and Ecological Modeling
Trent University
Peterborough, ON
K9J 7B8

www.dennismurray.ca

On Sep 4, 2015, at 5:47 PM, Zelenak, Jim
<jim_zelenak@fws.gov> wrote:

Greetings!

You have been identified by your peers, the U.S Fish and Wildlife Service, and our State, Federal, and Academic partners as a candidate to participate in a structured expert elicitation workshop that is a crucial part of our Species Status Assessment for the contiguous United States Distinct Population Segment (DPS) of Canada lynx.

The objective of the workshop is to assess the current status of and threats to the various DPS populations and to evaluate the DPS's viability under a range of future threat, habitat condition, and climate scenarios.

The workshop will be held in Minneapolis, Minnesota on Oct. 13-15, 2015.

This is not a formal invitation to participate in the workshop; it is a request to let me know at your earliest convenience whether or not you would be able to attend the workshop on those dates. We hope to finalize the list of invitees and send out formal invitations in the next week or so.

In addition to lynx experts, we are assembling a list of candidates for workshop presentations on boreal forest ecology (distribution, insects, fires, and likely future condition), climate change/ modeling, and the regulatory environment as it pertains to lynx in the Lower 48 states and southern Canada. If you have recommendations for experts on those topics, please also provide them to me with your response.

Thanks for your consideration of and prompt reply to this request.

Cheers!

Jim

--

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jim_zelenak@fws.gov

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(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Ron Moen](#)
Cc: [Tamara Smith](#)
Subject: Re: Lynx SSA Workshop - Reserve Rooms by Sept. 30
Date: Tuesday, September 29, 2015 3:15:40 PM

Hi Ron,

Really glad you are going to be able to attend. We will be sending out an agenda soon and some other materials on SSA, expert elicitation, conceptual modeling and our thoughts on the most pressing questions regarding lynx viability in the Lower 48. Hope to have that out by the end of the week or early next week.

If you have other questions, feel free to give me or Tam a call to discuss.

Looking forward to seeing you in a few weeks.

Jim

On Tue, Sep 29, 2015 at 2:56 PM, Ron Moen <rmoen@d.umn.edu> wrote:

Hi Jim,

I just did. Just out of curiosity, are you going to be sending any background information on these SSA workshops that we would need to review/prepare for before the workshop.

I am going to try to get down in time for the start at 1:00. I'm supposed to teach at 11:00 but may give the students an alternative seminar to go to.

Ron

On 29 Sep 2015 at 14:51, Zelenak, Jim wrote:

Date sent: Tue, 29 Sep 2015 14:51:10 -0600
Subject: Lynx SSA Workshop - Reserve Rooms by Sept. 30
From: "Zelenak, Jim" <jim_zelenak@fws.gov>
To: "Vashon, Jennifer" <jennifer.vashon@maine.gov>, Ron Moen <rmoen@d.umn.edu>, "Catton, Susan J -FS" <scatton@fs.fed.us>, "Squires, John -FS" <jsquires@fs.fed.us>, Jay Kolbe <jkolbe.fwp@gmail.com>, Jake Ivan - DNR <jake.ivan@state.co.us>, "Bowman, Jeff (MNR)" <jeff.bowman@ontario.ca>, "Jackson, Scott -FS" <sjackson03@fs.fed.us>, "Schwartz, Michael K -FS" <michaelkschwartz@fs.fed.us>, Erin Simons-Legaard <erin.simons@maine.edu>, "Hodges, Karen" <karen.hodges@ubc.ca>, "Baker, Richard (DNR)" <richard.baker@state.mn.us>, Nichole Cudworth <nichole.cudworth@wyo.gov>, <asiren@umass.edu>, <NathanM.Roberts@wisconsin.gov>, <Benjamin.Maletzke@dfw.wa.gov>, "McKelvey, Kevin -FS" <kmckelvey@fs.fed.us>, Dan Harrison <harrison@maine.edu>
Copies to: Kurt Broderdorp <kurt_broderdorp@fws.gov>, Bryon Holt <bryon_holt@fws.gov>

Tamara Smith <tamara_smith@fws.gov>,
Mark McCollough <mark_mccollough@fws.gov>,
Mary Parkin <mary_parkin@fws.gov>,
Heather Bell <heather_bell@fws.gov>,
Jonathan Cummings <jwcummings@usgs.gov>,
Seth Willey <seth_willey@fws.gov>,
Justin Shoemaker <justin_shoemaker@fws.gov>,
"Kaimy Marks" <kaimy_marks@fws.gov>,
Jodi Bush <jodi_bush@fws.gov>

> Hi All:

>

> If you will be attending the Minneapolis workshop, need a hotel room,
> and haven't reserved it yet, please do so today or tomorrow. After
> Sept. 30, the Hotel will release the blocked rooms for general
> occupancy and we cannot guarantee the government rate.

>

> Please see the attached hotel information and contact Kaimy Marks if
> you have questions about lodging or airfare.

>

> Look forward to seeing you all in a few weeks.

>

> Jim

>

> --

> Jim Zelenak, Biologist
> U.S. Fish and Wildlife Service
> Montana Ecological Services Office
> 585 Shepard Way, Suite 1
> Helena, MT 59601
> (406) 449-5225 ext. 220
> jim_zelenak@fws.gov

>

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Ron Moen
Center for Water and Environment, Natural Resources Research Institute
Biology Department, Swenson College of Science and Engineering
University of Minnesota Duluth
www.d.umn.edu/~rmoen, www.nrri.umn.edu/lynx, www.nrri.umn.edu/moose
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jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Erin Simons-Legaard](#)
Cc: [Mark McCollough](#)
Subject: Re: Lynx SSA Workshop Oct. 13-15
Date: Tuesday, September 29, 2015 3:25:38 PM

Hi Erin,

I hope you can attend for the entire meeting. We will send out an agenda in the next few days, but in general we will get underway at 1 PM on Tues., Oct 13. The first half-day will involve introductions and details about the process, expectations and roles, etc., followed by a handful of "range-wide" presentations - one on historic versus current distribution, one on lynx genetics in the lower 48, and one on the differences in the regulatory environment for lynx now compared to the time of listing. We may also have a climate change overview that day, time permitting.

On Wed. morning, we will begin with presentations on the current status of and threats to each of the populations in the DPS, and that will be followed on Wed. afternoon and all day Thursday by the structured elicitation process. The latter will focus on the expert panel, but I think it would be valuable to have you and several others available to inform those discussions as needed, and we hope to be able to have you present the modeling work you've been working on in Maine.

I hope this works for you and that you will be able to stay on for the whole meeting.

Feel free to call me or Mark if you have other questions. We will send out an agenda and other workshop materials soon.

Jim

On Fri, Sep 25, 2015 at 11:35 AM, Erin Simons-Legaard <erin.simons@maine.edu> wrote:

Hi Jim,

Thanks for the invitation; I think I should still be able to make it. Before I make travel arrangements, however, I wanted to check with you to see if the group of "other" experts are also requested to be there for the entirety of the workshop. For example, will presentations and group discussion be targeted for Wednesday and then discussions on Thursday be exclusively for the lynx experts to weigh in?

Thanks,
Erin

Erin Simons-Legaard
Research Assistant Professor
School of Forest Resources
5755 Nutting Hall
University of Maine
Orono, ME 04469-5755
erin.simons@maine.edu

On Fri, Sep 18, 2015 at 5:29 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi All:

Please see the attached invitation to participate in the Oct. 13-15 Lynx SSA Workshop in Minneapolis, along with the hotel information and invitational traveler form (both also attached).

Because we needed to keep the panel to a manageable number (10-12) while also getting representation from across the range of the DPS and in southern Canada, there are other researchers and experts (like you) who we were unable to invite to participate as panelists. Nonetheless, we believe that your expertise is also critical to these discussions and we invite you to participate in the workshop by presenting your research results and/or management insights for consideration by the expert panel.

I hope you are still interested and available to participate in the workshop. If you are unable to attend, please let me know at your earliest convenience.

The workshop facilitators and I will be in touch over the coming weeks to provide additional information on the structured process for the workshop and other details.

Please email or call me if you have any questions, and thanks again for your willingness to participate in this effort.

Cheers!

--

Jim Zelenak, Biologist
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jim_zelenak@fws.gov

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jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Schwartz, Michael K -FS](#)
Cc: [Kaimy Marks](#); [Jodi Bush](#)
Subject: Re: Canada Lynx Expert Elicitation Workshop
Date: Tuesday, September 29, 2015 3:40:04 PM
Attachments: [image002.png](#)
[image001.png](#)

Hi Mike,

We will be sending out an agenda and other materials for the lynx workshop soon. We will get underway at 1 PM on Tues., Oct 13, and I'm hoping after introductions and background information, etc., that we will have presentations on several "range-wide" issues, including what we know about historic and current lynx distribution (Kevin), genetics of lynx in the lower 48/southern periphery of the range (you), current versus past regulatory environment (Scott Jackson), and an overview of climate change as it may pertain to lynx in the Lower 48.

Then on Wed. morning we will have presentations on the current status and outlook for each of the DPS populations by lynx experts in the various regions (Dan Harrison in Maine, Ron Moen in Minn., John S. for Montana and the GYA, Ben Maletzke for Washington, and Jake Ivan for Colorado/S. Rockies. That will be followed by the actual elicitation process, and it would be great for you to stick around for as much of that as you can to clarify any genetics-related questions/discussions.

If you have any questions about travel arrangements, please contact Kaimy Marks in our office, who I've copied on this email.

Looking forward to seeing you there.

Jim

On Tue, Sep 29, 2015 at 10:10 AM, Schwartz, Michael K -FS <michaelkschwartz@fs.fed.us> wrote:

Hi Jim,

I can make this workshop but only on the 13 and most of the 14th. Does this still help? Also, are you willing to pay for hotel and airfare? Or at least hotel?

I hope to make this work. This seems like a very important workshop. My biggest travel issue is that I'm heading to TWS later in the week and need to be in Missoula at the end of the week. Sorry for the delay in responding.

Hope to see you soon.

Mike



Michael K. Schwartz, Ph.D.
Director
Forest Service

National Genomics Center for Wildlife and Fish Conservation

<http://www.fs.fed.us/research/genomics-center/>

p: +1 406.542.4161
e: michaelkschwartz@fs.fed.us

800 E. Beckwith Ave.
Missoula, MT 59801
www.fs.fed.us



Caring for the land and serving people

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Friday, September 04, 2015 3:48 PM
Subject: Canada Lynx Expert Elicitation Workshop

Greetings!

You have been identified by your peers, the U.S Fish and Wildlife Service, and our State, Federal, and Academic partners as a candidate to participate in a structured expert elicitation workshop that is a crucial part of our Species Status Assessment for the contiguous United States Distinct Population Segment (DPS) of Canada lynx.

The objective of the workshop is to assess the current status of and threats to the various DPS populations and to evaluate the DPS's viability under a range of future threat, habitat condition, and climate scenarios.

The workshop will be held in Minneapolis, Minnesota on Oct. 13-15, 2015.

This is not a formal invitation to participate in the workshop; it is a request to let me know at your earliest convenience whether or not you would be able to attend the workshop on those dates. We hope to finalize the list of invitees and send out formal invitations in the next week or so.

In addition to lynx experts, we are assembling a list of candidates for workshop presentations on boreal forest ecology (distribution, insects, fires, and likely future condition), climate change/ modeling, and the regulatory environment as it pertains to lynx in the Lower 48 states and southern Canada. If you have recommendations for experts on those topics, please also provide them to me with your response.

Thanks for your consideration of and prompt reply to this request.

Cheers!

Jim

--

Jim Zelenak, Biologist

U.S. Fish and Wildlife Service

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jim_zelenak@fws.gov

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jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Mark McCollough](#); [Tamara Smith](#); [Bryon Holt](#); [Kurt Broderdorp](#)
Cc: [Mary Parkin](#); [Heather Bell](#); [Seth Willey](#); [Jonathan Cummings](#); [Kurt Johnson](#); [Jodi Bush](#)
Subject: Fwd: Lynx and SSA background
Date: Tuesday, September 29, 2015 3:49:13 PM

Hi All,

Jodi worked with Robin O' Malley and Toni Lyn Morelli at USGS Climate Science Centers to arrange for Alexej Siren with Umass and the Northeast Climate Science Center to attend the workshop and present the current state of the science with regard to snow modeling.

See trail below.

I will reach out to Alexej soon to discuss our needs.

----- Forwarded message -----

From: **Jodi Bush** <jodi_bush@fws.gov>
Date: Tue, Sep 29, 2015 at 7:44 AM
Subject: Re: Lynx and SSA background
To: Alexej Siren <asiren@umass.edu>
Cc: Kaimy Marks <kaimy_marks@fws.gov>, Jim Zelenak <jim_zelenak@fws.gov>

Alexej. We are glad to have you. Please give Kaimy Marks a call at 406.449.5225, x207 and she can walk you thru it. I am out of office next couple of days. Thanks. JB

Sent from my iPhone

On Sep 28, 2015, at 3:17 PM, Alexej Siren <asiren@umass.edu> wrote:

Hello Jodi,

I'm happy to be on board and look forward to the meeting in Minneapolis. I will fax the FBMS vendor request to you tomorrow. It may be easier for me to scan the form and email it back to you. Is that an option? Also, I assume that I should make a room reservation now? I noticed that the cutoff date was tomorrow.

Thanks again and I look forward to meeting you soon.

Alexej

From: Bush, Jodi [mailto:jodi_bush@fws.gov]
Sent: Monday, September 28, 2015 3:39 PM
To: Toni Lyn Morelli <morelli@umass.edu>
Cc: asiren <asiren@umass.edu>; Mary Ratnaswamy <mratnaswamy@usgs.gov>; Addie Rose Holland <aholland@geo.umass.edu>; Jim Zelenak <jim_zelenak@fws.gov>; Kaimy Marks <kaimy_marks@fws.gov>
Subject: Re: Lynx and SSA background

Thanks Toni. We are glad to have Alexej involved. Please see attached for information about the process. I will have Jim Zelenak (our Service lead) reach out to him later this week. In the meantime, please have him fill out the attached paperwork (there are contacts if he has questions) and we will get the travel arrangements moving. JB

Jodi L. Bush

Field Supervisor

Montana Ecological Services Office

585 Shepard Way, Suite 1

Helena, MT 59601

(406) 449-5225, ext.205

On Mon, Sep 28, 2015 at 2:31 PM, Toni Lyn Morelli <morelli@umass.edu> wrote:

Good afternoon Jodi,

We at the Climate Science Centers are happy to hear that we can help support the lynx SSA process. Our NE CSC Fellow Alexej Siren (copied here, along with our Director and Program Manager) is planning to attend the meeting in Minneapolis and could provide information on snow cover changes, as well as population information from his many years of research on lynx and snowshoe hare in the northeast. I'll let him follow up with you directly to discuss what kind of presentation you might be looking for.

In the meantime, I understand that there are funds available from FWS to support

Alexej's flight, hotel, and per diem. Again, Alexej will follow up with Shannon as he didn't yet receive the FBMS Vendor Request Form.

Happy to have made this connection,

Toni Lyn

Toni Lyn Morelli
USGS Research Ecologist, DOI Northeast Climate Science Center
Adjunct Assistant Professor, Department of Environmental Conservation

University of Massachusetts
134 Morrill Science Center, Amherst MA 01003

Office: 413-545-2515 Mobile: 313-919-0191
tmorelli@usgs.gov
necsc.umass.edu/people/Toni-Lyn-Morelli

----- Forwarded message -----
From: **Bush, Jodi** <jodi_bush@fws.gov>
Date: Fri, Sep 25, 2015 at 10:52 AM
Subject: Lynx and SSA background
To: Robin O'Malley <romalley@usgs.gov>
Cc: Jim Zelenak <jim_zelenak@fws.gov>

Hi Robin. Here is some more information for you regarding the SSA process and where we are headed. I've also attached the letter we are sending to presenters which has a little more information in it for your use. I've also provided the hotel information because it is getting close. Please give me a call if you have any questions at all or send me an email. Thanks for your help. JB

Jodi L. Bush

Field Supervisor

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--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: bob.broscheid@state.co.us; [Jake Ivan - DNR](#); [Odell, Eric](#); [Moore, Virgil](#); [Dustin Miller](#) (dustin.miller@osc.idaho.gov); [Joshua Uriarte](#); [Sallabanks, Rex](#); [Sam Eaton](#); Chandler.woodcock@maine.gov; [Vashon, Jennifer](#); moritzw@michigan.gov; DNR-Wildlife@michigan.gov; commissioner.dnr@state.mn.us; Ed.Boggess@state.mn.us; [Baker, Richard \(DNR\)](#); john.erb@state.mn.us; jhagener@mt.gov; JTubbs@mt.gov; [McDonald, Ken](#); [Inman, Bob](#); Jay.Kolbe; glenn.normandeau@wildlife.nh.gov; alexandra.sandoval@state.nm.us; patricia.riexinger@dec.ny.gov; curt.melcher@state.or.us; [Greg Sheehan](#); [Kimberly Hersey](#); louis.porter@state.vt.us; [mark scott](#); [Bernier, Chris](#); director@dfw.wa.gov; cpl@dnr.wa.gov; [Lewis, Jeffrey C \(DFW\)](#); cathy.stepp@wisconsin.gov; kurt.thiede@wisconsin.gov; scott.talbot@wyo.gov; [Bob Lanka](#); [Zack Walker](#); [Nichole Cudworth](#); Nick.Wiley@myfwc.com; craig.mclaughlin@state.co.us; [Connolly, James](#); bumpa@michigan.gov; kennedyd@michigan.gov; Paul.Telander@state.mn.us; Mark.Ellingwood@wildlife.nh.gov; John.Kanter@wildlife.nh.gov; Jill.Killborn@wildlife.nh.gov; William.Staats@wildlife.nh.gov; Patrick.Tate@wildlife.nh.gov; stewart.liley@state.nm.us; rick.winslow@state.nm.us; [Jensen, Paul G \(DEC\)](#); Tom.Hauge@Wisconsin.gov; Erin.Crain@Wisconsin.gov; Owen.Boyle@Wisconsin.gov; Johnf.olson@Wisconsin.gov; David.MacFarland@Wisconsin.gov; John.White@Wisconsin.gov; NathanM.Roberts@wisconsin.gov; Benjamin.Maletzke@dfw.wa.gov
Cc: [Jodi Bush](#); [Seth Willey](#); [Mary Parkin](#); [Heather Bell](#); [Jonathan Cummings](#); [Mark McCollough](#); [Tamara Smith](#); [Bryon Holt](#); [Kurt Broderdorp](#)
Subject: Reminder: Lynx SSA Coordination Call
Date: Tuesday, September 29, 2015 4:02:25 PM

Hi All:

Just a reminder that tomorrow (Wednesday, Sept. 30) from 1 - 2:30 PM Mountain Time, we will hold our 3rd monthly coordination call with State agencies regarding the species status assessment for the Canada lynx DPS.

Call-in: 866-822-7385

Participant passcode: 5396168

If we have failed to include anyone from your agency on this distribution list, please forward this to them.

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Willey, Seth](#)
Subject: Re: Reminder: Lynx SSA Coordination Call
Date: Tuesday, September 29, 2015 4:05:00 PM

Sorry we are still having issues with this. Last Wed. of every month, same time.

On Tue, Sep 29, 2015 at 4:03 PM, Willey, Seth <seth_willey@fws.gov> wrote:

I'm booked up. Is there a standing date and time, so I can get this on my calendar earlier?

Thanks,
Seth

Seth L. Willey
Acting Regional ESA Chief
Mountain-Prairie Region, USFWS
Seth_Willey@fws.gov
303-236-4257

On Tue, Sep 29, 2015 at 4:02 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi All:

Just a reminder that tomorrow (Wednesday, Sept. 30) from 1 - 2:30 PM Mountain Time, we will hold our 3rd monthly coordination call with State agencies regarding the species status assessment for the Canada lynx DPS.

Call-in: 866-822-7385
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Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office

585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Erin Simons-Legaard](#)
Cc: [Mark McCollough](#)
Subject: Re: Lynx SSA Workshop Oct. 13-15
Date: Tuesday, September 29, 2015 5:25:40 PM

Hi Erin,

I hope you can attend for the entire meeting. We will send out an agenda in the next few days, but in general we will get underway at 1 PM on Tues., Oct 13. The first half-day will involve introductions and details about the process, expectations and roles, etc., followed by a handful of "range-wide" presentations - one on historic versus current distribution, one on lynx genetics in the lower 48, and one on the differences in the regulatory environment for lynx now compared to the time of listing. We may also have a climate change overview that day, time permitting.

On Wed. morning, we will begin with presentations on the current status of and threats to each of the populations in the DPS, and that will be followed on Wed. afternoon and all day Thursday by the structured elicitation process. The latter will focus on the expert panel, but I think it would be valuable to have you and several others available to inform those discussions as needed, and we hope to be able to have you present the modeling work you've been working on in Maine.

I hope this works for you and that you will be able to stay on for the whole meeting.

Feel free to call me or Mark if you have other questions. We will send out an agenda and other workshop materials soon.

Jim

On Fri, Sep 25, 2015 at 11:35 AM, Erin Simons-Legaard <erin.simons@maine.edu> wrote:

Hi Jim,

Thanks for the invitation; I think I should still be able to make it. Before I make travel arrangements, however, I wanted to check with you to see if the group of "other" experts are also requested to be there for the entirety of the workshop. For example, will presentations and group discussion be targeted for Wednesday and then discussions on Thursday be exclusively for the lynx experts to weigh in?

Thanks,
Erin

Erin Simons-Legaard
Research Assistant Professor
School of Forest Resources
5755 Nutting Hall
University of Maine
Orono, ME 04469-5755
erin.simons@maine.edu

On Fri, Sep 18, 2015 at 5:29 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi All:

Please see the attached invitation to participate in the Oct. 13-15 Lynx SSA Workshop in Minneapolis, along with the hotel information and invitational traveler form (both also attached).

Because we needed to keep the panel to a manageable number (10-12) while also getting representation from across the range of the DPS and in southern Canada, there are other researchers and experts (like you) who we were unable to invite to participate as panelists. Nonetheless, we believe that your expertise is also critical to these discussions and we invite you to participate in the workshop by presenting your research results and/or management insights for consideration by the expert panel.

I hope you are still interested and available to participate in the workshop. If you are unable to attend, please let me know at your earliest convenience.

The workshop facilitators and I will be in touch over the coming weeks to provide additional information on the structured process for the workshop and other details.

Please email or call me if you have any questions, and thanks again for your willingness to participate in this effort.

Cheers!

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
 [\(406\) 449-5225 ext. 220](tel:(406)449-5225)
jim_zelenak@fws.gov

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Daniel Harrison](#)
Subject: Re: Lynx SSA Workshop - Reserve Rooms by Sept. 30
Date: Wednesday, September 30, 2015 8:17:08 AM

Thanks Dan.

We hope to send out an agenda and some background information soon, but if you have any questions in the meantime, don't hesitate to email or call. I understand you are talking to Mark about the status update for lynx in Maine that you will be giving - we anticipate that the updates from you and the other experts from other parts of the range will take place on Wed. morning, and we are trying to keep those presentations in the 20-30 minute range.

Really glad that you'll be joining us and participating on the expert panel.

Jim

On Wed, Sep 30, 2015 at 8:12 AM, Daniel Harrison <harrison@maine.edu> wrote:

I am reserved.

Dan

Daniel J. Harrison
Professor and Chair - Department of Wildlife, Fisheries, and Conservation Biology
Cooperating Professor of Sustainable Forestry
The University of Maine
5755 Nutting Hall, Room 210
Orono, ME 04469-5755
(207) 581-2867
harrison@maine.edu

On Tue, Sep 29, 2015 at 4:51 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi All:

If you will be attending the Minneapolis workshop, need a hotel room, and haven't reserved it yet, please do so today or tomorrow. After Sept. 30, the Hotel will release the blocked rooms for general occupancy and we cannot guarantee the government rate.

Please see the attached hotel information and contact Kaimy Marks if you have questions about lodging or airfare.

Look forward to seeing you all in a few weeks.

Jim

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
 [\(406\) 449-5225 ext. 220](tel:(406)449-5225)
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Montana Ecological Services Office
585 Shepard Way, Suite 1
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(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Hooley, Sharon](#)
To: [Kaimy Marks](#); [Jodi Bush](#); [Brent Esmoil](#)
Subject: Lynx Workshop
Date: Wednesday, September 30, 2015 8:49:25 AM

Good morning Kaimy,

Regarding funding for the lynx meeting in MN. Please use the following account to purchase the airline tickets.

FXHC11220600000 / FF06E11000 / 156

Jodi was checking in with the RO to see if the FY2015 funds would be available to use for the remainder of the travel which will not be incurred until after 10/01/15 such as the hotels and per diem.

Let me know if you need further information.

Sharon

Sharon Hooley
Administrative Officer
MT ES Office
585 Shepard Way
Helena, MT 59601

Karen; Baker, Richard (DNR); Nichole Cudworth; asiren@umass.edu; NathanM.Roberts@wisconsin.gov; Benjamin.Maletzke@dfw.wa.gov; McKelvey, Kevin -FS; Dan Harrison
Cc: Kurt Broderdorp; Bryon Holt; Tamara Smith; Mark McCollough; Mary Parkin; Heather Bell; Jonathan Cummings; Seth Willey; Justin Shoemaker; Kaimy Marks; Jodi Bush
Subject: Lynx SSA Workshop - Reserve Rooms by Sept. 30

Hi All:

If you will be attending the Minneapolis workshop, need a hotel room, and haven't reserved it yet, please do so today or tomorrow. After Sept. 30, the Hotel will release the blocked rooms for general occupancy and we cannot guarantee the government rate.

Please see the attached hotel information and contact Kaimy Marks if you have questions about lodging or airfare.

Look forward to seeing you all in a few weeks.

Jim

--

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Montana Ecological Services Office
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jim_zelenak@fws.gov

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U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Roberts, Nathan M - DNR](#)
To: [Bush, Jodi](#)
Cc: [Jonathan Mawdsley](#); [Jim Zelenak](#); [Tamara Smith](#)
Subject: RE: Lynx SSA
Date: Wednesday, September 30, 2015 9:22:04 AM

Hello Jodi,

Thank you. Yes, WI is very interested in this process. I will plan on attending.

Thanks again,

-Nathan

Nathan M. Roberts, PhD
Bear, Wolf, and Furbearer Research Scientist
Wisconsin Department of Natural Resources
107 Sutliff Ave.
Rhineland, WI 54501

NathanM.Roberts@wisconsin.gov
715.490.9345

From: Bush, Jodi [mailto:jodi_bush@fws.gov]
Sent: Friday, September 25, 2015 1:45 PM
To: Roberts, Nathan M - DNR
Cc: Jonathan Mawdsley; Jim Zelenak; Tamara Smith
Subject: Re: Lynx SSA

Nathan. Thanks so much for your interest. As I am sure you are aware, we have been in the process of assembling a panel of lynx experts most familiar with each of the DPS populations and whose knowledge, professional judgments, and opinions we will elicit to inform our understanding of lynx status, the nature and magnitude of potential threats, and the likelihood of their future persistence.

Because we needed to keep the panel to a manageable number (10-12) while also getting representation from across the range of the DPS and in southern Canada, there are other researchers and experts (like you) who we were unable to invite to participate as panelists. Nonetheless, if your agency would like to have you attend the workshop as an observer, we would be happy to have you.

A block of rooms has been reserved at the Crowne Plaza Hotel near the Minneapolis Airport (See Attachment for additional hotel information). The workshop will be held in a conference room at the hotel. We will start at 1pm on Tuesday, October 13 and finish up no later than 5pm on Thursday, October 15. The block of rooms, at the government rate of \$140/night, is being held until September 30. Please call the Crowne Plaza Hotel at 952-854-9000 and reference the USFWS to reserve your room. Please note that the cancellation policy for this hotel is 24 hours prior to check-in.

Please feel free to contact me or Jim Zelenak directly if you have questions. Thank you again for your interest. We look forward to your participation. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Mon, Sep 21, 2015 at 9:26 AM, Jonathan Mawdsley <jmawdsley@fishwildlife.org>
wrote:

Hello Nathan,

Many thanks for the note, and for your interest – I am forwarding your contact information
along to Jodi Bush from U. S. FWS who is coordinating the SSA process.

All the best,
Jonathan Mawdsley

Jonathan R. Mawdsley, Ph.D.
Fish and Wildlife Science Coordinator
Association of Fish and Wildlife Agencies
1100 First Street, NE, Suite 825
Washington, DC 20002 USA
Phone: (202) 838-3462
Cell: (202) 997-6628
Fax: (202) 350-9869
E-mail: jmawdsley@fishwildlife.org
Web: <http://www.fishwildlife.org>

From: Roberts, Nathan M - DNR [mailto:NathanM.Roberts@wisconsin.gov]
Sent: Wednesday, September 16, 2015 7:29 PM
To: Jonathan Mawdsley
Subject: Lynx SSA

Hello Jonathan,
Is there still an opportunity to get involved with the SSA process? The State of Wisconsin is
very interested in participating however we can.
All the best,
-Nathan

Nathan M. Roberts, PhD
Bear, Wolf, and Furbearer Research Scientist
Wisconsin Department of Natural Resources
107 Sutliff Ave.
Rhineland, WI 54501

NathanM.Roberts@wisconsin.gov
715.490.9345

From: lynxdan@gmail.com
To: [McCollough, Mark](#)
Subject: Re: lynx presentation guidance
Date: Wednesday, September 30, 2015 9:27:30 AM

Hi Mark,

Thanks for the guidance. I will look forward to receiving additional direction from Jim. A slide with incidental lynx occurrences, as well as tracks from IFW's surveys conducted post -2006 since 2004 -overlaid with current critical habitat boundaries would be really useful. I could also use a slide with a map depicting recent occurrences in Vermont and NH.

I have all the other materials pulled together and am working to organize and streamline. Will distribute to you and Erin for comments and to make sure Erin and I have a seamless transition, hopefully before the end of this week. An agenda from Jim with times for our talks would really help!!

I will be in Mass with 3 days of presentations and workshops on our forest birds study next week. Thus, I will need to have the lynx talk ready to go before I leave on the evening of Tuesday, 6 October.

Cheers- Dan

Daniel J. Harrison
Professor and Chair - Department of Wildlife, Fisheries, and Conservation Biology
Cooperating Professor of Sustainable Forestry
The University of Maine
5755 Nutting Hall, Room 210
Orono, ME 04469-5755
(207) 581-2867
harrison@maine.edu

On Tue, Sep 29, 2015 at 1:55 PM, McCollough, Mark <mark_mccollough@fws.gov> wrote:
Thanks to both of you for beginning work on your lynx presentations for the MN meeting.

I just got off a call with Jim Zelenak and the core USFWS team. You will both receive a packet with more information and guidance, but here is what I gleaned from our recent discussion:

- Agenda - proposed agenda is that Zelenak, McKelvey, Swartz, Jackson and a climate change expert will present the first afternoon (Tuesday) and give broad, range-wide discussion of listing/critical habitat, historic and current range, genetics, US Forest Service conservation efforts, and climate change.
- you will both present the morning of the second day (Wednesday). Dan will present for Maine. Jim is not sure whether Erin will follow Dan or present later in the day.
- you should prepare for 20 min. presentations, but up to 30 min. would be acceptable (I expressed your concerns about time)
- Jim will distribute more information about expectations for key elements for the

summaries of lynx status in geographic regions (Dan's talk) - but I suggest you proceed to develop your talk with the outline we discussed this morning

- Dan - please focus on history (brief) leading up to current status of lynx, hare, and their habitat (basically as we discussed this morning)
- Erin - your talk will address threats that currently affect lynx, new threats on the horizon, future concern about persistence - e.g. forestry and habitat, land ownership/conservation, climate change/snow + forest composition, anthropogenic threats (development - wind and Plum Creek/Irving, trapping, road mortality, illegal shooting), bobcat and other competitors/predators

I am available today and Thursday to help with provide info, power point slides, etc. today and Thursday. I will be off Friday and all of next week (going with Cathy to Ottawa), but will have my computer with me and will have a limited ability to exchange information.

Thanks! Mark

--

Mark McCollough, Ph.D.
Endangered Species Specialist
Maine Field Office
U. S. Fish and Wildlife Service
17 Godfrey Drive, Suite 2
Orono, ME 04473
Phone [207 866-3344](tel:207-866-3344) x115
Cell Phone: [207 944-5709](tel:207-944-5709)
mark_mccollough@fws.gov

From: [Alexej Siren](#)
To: "[Zelenak, Jim](#)"
Subject: RE: Lynx and SSA background
Date: Wednesday, September 30, 2015 11:22:16 AM

Hello Jim,

That's great! I look forward to our conversation at 3 pm EST tomorrow.

Alexej

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Wednesday, September 30, 2015 1:20 PM
To: Alexej Siren <asiren@umass.edu>
Subject: Re: Lynx and SSA background

Hi Alexej,

If it works for you, I will call your cell tomorrow at 3 PM Eastern Time. We won't need a whole hour, but just wanted to talk to you briefly about my thoughts on your role in the workshop and to answer any questions you may have.

Let me know if that will work for you.

Jim

On Wed, Sep 30, 2015 at 10:52 AM, Alexej Siren <asiren@umass.edu> wrote:

Hello Jim,

How much time were you thinking? I have an hour slot available tomorrow from 3 – 4 pm EST and one on Friday from 11 am – pm EST. Do these time slots work for you? If not I may be able to find a couple half hour slot on one of those days.

Cell: (207) 752-6534
Email: asiren@umass.edu

Thanks!

Alexej

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Wednesday, September 30, 2015 11:31 AM
To: Alexej Siren <asiren@umass.edu>
Subject: Re: Lynx and SSA background

Hi Alexej,

Glad you will be joining us in Minneapolis for the lynx workshop.

Could you reply with your phone number and other contact info and let me know a time in the next day or so when we could talk?

Thanks.

Jim

On Tue, Sep 29, 2015 at 3:17 PM, Alexej Siren <asiren@umass.edu> wrote:

Hello Jodi,

Thanks for letting me know. We took care of the flight and hotel yesterday. All squared away!

Alexej

From: Jodi Bush [mailto:jodi_bush@fws.gov]

Sent: Tuesday, September 29, 2015 9:45 AM

To: Alexej Siren <asiren@umass.edu>

Cc: Kaimy Marks <kaimy_marks@fws.gov>; Jim Zelenak <jim_zelenak@fws.gov>

Subject: Re: Lynx and SSA background

Alexej. We are glad to have you. Please give Kaimy Marks a call at 406.449.5225, x207 and she can walk you thru it. I am out of office next couple of days. Thanks. JB

Sent from my iPhone

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Hello Jodi,

I'm happy to be on board and look forward to the meeting in Minneapolis. I will fax the FBMS vendor request to you tomorrow. It may be easier for me to scan the form and email it back to you. Is that an option? Also, I assume that I should make a room reservation now? I noticed that the cutoff date was tomorrow.

Thanks again and I look forward to meeting you soon.

Alexej

From: Bush, Jodi [mailto:jodi_bush@fws.gov]

Sent: Monday, September 28, 2015 3:39 PM

To: Toni Lyn Morelli <morelli@umass.edu>

Cc: asiren <asiren@umass.edu>; Mary Ratnaswamy <mratnaswamy@usgs.gov>;

Addie Rose Holland <aholland@geo.umass.edu>; Jim Zelenak <jim_zelenak@fws.gov>; Kaimy Marks <kaimy_marks@fws.gov>

Subject: Re: Lynx and SSA background

Thanks Toni. We are glad to have Alexej involved. Please see attached for information about the process. I will have Jim Zelenak (our Service lead) reach out to him later this week. In the meantime, please have him fill out the attached paperwork (there are contacts if he has questions) and we will get the travel arrangements moving. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Mon, Sep 28, 2015 at 2:31 PM, Toni Lyn Morelli <morelli@umass.edu> wrote:

Good afternoon Jodi,

We at the Climate Science Centers are happy to hear that we can help support the lynx SSA process. Our NE CSC Fellow Alexej Siren (copied here, along with our Director and Program Manager) is planning to attend the meeting in Minneapolis and could provide information on snow cover changes, as well as population information from his many years of research on lynx and snowshoe hare in the northeast. I'll let him follow up with you directly to discuss what kind of presentation you might be looking for.

In the meantime, I understand that there are funds available from FWS to support Alexej's flight, hotel, and per diem. Again, Alexej will follow up with Shannon as he didn't yet receive the FBMS Vendor Request Form.

Happy to have made this connection,

Toni Lyn

Toni Lyn Morelli
USGS Research Ecologist, DOI Northeast Climate Science Center
Adjunct Assistant Professor, Department of Environmental Conservation
University of Massachusetts
134 Morrill Science Center, Amherst MA 01003
Office: 413-545-2515 Mobile: 313-919-0191
tmorelli@usgs.gov
necsc.umass.edu/people/Toni-Lyn-Morelli

----- Forwarded message -----
From: **Bush, Jodi** <jodi_bush@fws.gov>

Date: Fri, Sep 25, 2015 at 10:52 AM
Subject: Lynx and SSA background
To: Robin O'Malley <romalley@usgs.gov>
Cc: Jim Zelenak <jim_zelenak@fws.gov>

Hi Robin. Here is some more information for you regarding the SSA process and where we are headed. I've also attached the letter we are sending to presenters which has a little more information in it for your use. I've also provided the hotel information because it is getting close. Please give me a call if you have any questions at all or send me an email. Thanks for your help. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
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(406) 449-5225, ext.205

--

Jim Zelenak, Biologist
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From: [Smith, Tamara](#)
To: [Jim Zelenak](#)
Subject: Fwd: Lynx SSA Workshop Oct. 13-15
Date: Wednesday, September 30, 2015 12:44:46 PM

----- Forwarded message -----

From: **Lee Frelich** <freli001@umn.edu>
Date: Wed, Sep 30, 2015 at 11:34 AM
Subject: Re: Lynx SSA Workshop Oct. 13-15
To: "Smith, Tamara" <tamara_smith@fws.gov>

That is a busy week, since I am teaching my Landscape Ecology class as well as taking over the Forest Ecology class for someone who is out of the country that week. The best I could do would be to attend Wednesday afternoon from 3:00 to end of day and Thursday morning from 8:00 to about 1:00.

Lee

Lee E. Frelich
Director, The University of Minnesota Center for Forest Ecology
Phone: 612-624-3671, cell: 612-991-1359
<http://cffe.cfans.umn.edu/>

On Wed, Sep 30, 2015 at 10:49 AM, Smith, Tamara <tamara_smith@fws.gov> wrote:

Hello Dr. Frelich,

I am just following up on our invitation for you to participate in a lynx expert elicitation workshop next month. Have you had time to consider this proposal?

Please email or call Jim Zelenak (jim_zelenak@fws.gov (406) 449-5225 ext. 220) if you have any questions.

Thank you,
Tam

On Fri, Sep 25, 2015 at 9:56 AM, Smith, Tamara <tamara_smith@fws.gov> wrote:

Dr. Frelich,

Please see the attached invitation to participate in the Oct. 13-15 Lynx SSA Workshop in Minneapolis, along with the hotel information and invitational traveler form (both also attached). We are inviting you due to your climate change expertise in Minnesota.

Because we needed to keep the panel to a manageable number (10-12) while also getting representation from across the range of the DPS and in southern Canada, there are other researchers and experts (like you) who we were unable to invite to participate as panelists. Nonetheless, we believe that your expertise is also critical to these discussions and we invite you to participate in the workshop by presenting your research results and/or management insights for consideration by the expert panel.

I hope you are interested and available to participate in the workshop. If you are unable to

attend, please let me know at your earliest convenience.

The workshop facilitators and I will be in touch over the coming weeks to provide additional information on the structured process for the workshop and other details.

Please email or call Jim Zelenak (jim_zelenak@fws.gov (406) 449-5225 ext. 220) if you have any questions, and thanks again for your willingness to participate in this effort.

Cheers!

-Tam

--

Tamara Smith
U.S. Fish and Wildlife Service
Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425
[612-725-3548 ext. 2219](tel:612-725-3548)
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--

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612-725-3548 ext. 2219
612-600-1599 cell

From: [Smith, Tamara](mailto:Smith.Tamara)
To: [Jim Zelenak](mailto:Jim.Zelenak)
Subject: Fwd: Canada lynx expert elicitation meeting - potential Leech Lake Band observer?
Date: Wednesday, September 30, 2015 1:29:32 PM

----- Forwarded message -----

From: **Ford, Walt** <walt_ford@fws.gov>
Date: Wed, Sep 30, 2015 at 1:27 PM
Subject: Re: Canada lynx expert elicitation meeting - potential Leech Lake Band observer?
To: "Smith, Tamara" <tamara_smith@fws.gov>
Cc: Tony Swader <tswader@grandportage.com>, Seth Moore <samoore@boreal.org>, Margaret Watkins <mwatkins@grandportage.com>, Tara Geshick <tgeshick@boisfortensn.gov>, Sonny Myers <smyers@1854treatyauthority.org>, Andy Edwards <aedwards@1854treatyauthority.org>, Nick McCann <nmccann@glifwc.org>, Peter David <pdavid@glifwc.org>

Tam,

For the Grand Portage Band of Lake Superior Chippewa, contact Tony Swader tswader@grandportage.com, Seth Moore samoore@boreal.org and Margaret Watkins mwatkins@grandportage.com. For the Boise Forte Band of Lake Superior Chippewa, contact Tara Geshick tgeshick@boisfortensn.gov. For the 1854 Treaty Authority, contact Sonny Myers smyers@1854treatyauthority.org and Andy Edwards aedwards@1854treatyauthority.org. And for the Great Lakes Indian Fish and Wildlife Commission, contact Nick McCann nmccann@glifwc.org and Peter David pdavid@glifwc.org.

Walt Ford
Tribal Liaison to MN / IA &
Refuge Manager at Rice Lake & Mille Lacs NWR
36289 State Hwy. 65
McGregor, MN 55760
218-768-2402 office
218-821-6794 cell
walt_ford@fws.gov

On Wed, Sep 30, 2015 at 12:52 PM, Smith, Tamara <tamara_smith@fws.gov> wrote:
Thank you Walt. Please send me contacts for the others you referenced. I will pass that info. on to Jim Zelenak in MT.

On Wed, Sep 30, 2015 at 11:43 AM, Ford, Walt <walt_ford@fws.gov> wrote:
Hi Tam,

Feel free to contact Steve Mortensen, Director, Fish, Wildlife and Plants, Leech Lake Band of Ojibwe at smortensen@lldrm.org

That said, I'm assuming you have the necessary contact info for the Grand Portage, Boise Forte (Nett Lake), GLIFWC and 1854 Treaty Authority?

Walt Ford

Tribal Liaison to MN / IA &
Refuge Manager at Rice Lake & Mille Lacs NWR
36289 State Hwy. 65
McGregor, MN 55760
218-768-2402 office
218-821-6794 cell
walt_ford@fws.gov

On Wed, Sep 30, 2015 at 10:53 AM, Smith, Tamara <tamara_smith@fws.gov> wrote:
Hi Walt,

We are having an expert elicitation meeting Oct. 13-15 for the Canada lynx Species Status Assessment (SSA). Is there a person from Leech Lake Band that would be interested in being an observer at the meeting? It will be held in Bloomington, MN. If you think there might be someone who is interested, please provide me with a contact and I will send it to the people in Montana that are organizing the meeting - they will send out an official invitation (so keep it internal for now).

Thank you,
Tam

--
Tamara Smith
U.S. Fish and Wildlife Service
Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425
612-725-3548 ext. 2219
612-600-1599 cell

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From: [Zelenak, Jim](#)
To: [Maletzke, Benjamin T \(DFW\)](#)
Subject: Re: Lynx SSA Workshop - Reserve Rooms by Sept. 30
Date: Thursday, October 01, 2015 7:17:26 AM

Hi Ben,

I'm available any time on Friday; my normal work hours are 7 - 3:30 Mountain Time. Let me know what time works best for you and I will give you a call at the number in your signature block unless you provide a different one. Or you could call my number below when convenient for you - I should be at or near my desk most of the day.

Jim

On Wed, Sep 30, 2015 at 9:41 PM, Maletzke, Benjamin T (DFW)

<Benjamin.Maletzke@dfw.wa.gov> wrote:

Hi Jim,

Thanks for including me on the call today. I was able to speak with Jodi briefly last week, however it would be helpful for me if you had a few minutes to discuss what you would like included in the presentation I need to prepare as well as other questions we might receive on the panel. Do you have time on Friday to discuss this?

Thanks,
Ben

Benjamin Maletzke, PhD
Wildlife Biologist
Washington Dept of Fish and Wildlife
(509) 592-7324

"Zelenak, Jim" <jim_zelenak@fws.gov> wrote:

Hi All:

If you will be attending the Minneapolis workshop, need a hotel room, and haven't reserved it yet, please do so today or tomorrow. After Sept. 30, the Hotel will release the blocked rooms for general occupancy and we cannot guarantee the government rate.

Please see the attached hotel information and contact Kaimy Marks if you have questions about lodging or airfare.

Look forward to seeing you all in a few weeks.

Jim

--

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| jim_zelenak@fws.gov

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From: [Monette, DJ](#)
To: [Zelenak, Jim](#)
Cc: [Ivy Allen](#); [Nathan Dexter](#); [Charles Traxler](#); [Garrett Peterson](#); [Jodi Bush](#); [Mary Parkin](#); [Heather Bell](#); [Jonathan Cummings](#)
Subject: Re: Tribal Participation in Lynx Expert Elicitation Workshop
Date: Thursday, October 01, 2015 10:38:44 AM

Thanks Jim! Hopefully you can get the Tribal e-mail to us early afternoon today.

NALs, once we receive the e-mail from Jim, let's plan to chat for 10 minutes or so to figure out what time we will send the e-mail to the interested Tribes.

Sound like a plan?

Thanks,

DJ

On Thu, Oct 1, 2015 at 11:02 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi All:

I've discussed the conversation we had yesterday with my Field Supervisor, Jodi Bush (copied here), and the lynx SSA Implementation Team/ Workshop facilitators, and all agree that we should extend an invitation to the tribes to participate in the Oct. 13-15 workshop in Minneapolis.

Jodi would like us to offer two slots for in-person participation by tribal members/representatives, and is agreeable to the simultaneous email distribution of an invitation indicating that the first two replies that I receive will fill the two lots (first-come; first-serve basis, as we all discussed yesterday).

I will draft an email next and send it to each of you, and you-all can work out the details of the timing of the simultaneous electronic invitation. I will include a 2-page fact sheet on the SSA process and hotel/venue information. Although we would prefer not to offer travel assistance as part of the broad invitation, if we have tribal folks who express an interest in attending in person, we will certainly offer the same travel assistance that we have offered to other participants.

The workshop facilitators are not agreeable to the other topic we discussed yesterday - the potential to provide a conference line for tribal members who would like to listen in remotely. First, because we will be having many presentations and will be doing work on-screen at the workshop, there's a lot that would not be available to folks on a conference line; second, some of our State partners asked about whether there would be a conference line available to listen in, and we told them no.

That said, we will make the workshop summary and presentations available to any tribes that express an interest, and we will welcome their continued participation in the SSA and subsequent recovery planning efforts.

I'll work on drafting the email and will send that to you as soon as I can.

Let me know if you have questions.

Thanks,

Jim

--

Jim Zelenak, Biologist

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(406) 449-5225 ext. 220
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--

DJ Monette

U.S. Fish and Wildlife Service

Acting Deputy National Native American Programs Coordinator /

Northeast Region Native American Liaison

300 Westgate Center Drive

Hadley, MA 01035

Office: (413) 253-8662

Cell: (413) 244-4495

Fax: (413) 253-8456

dj_monette@fws.gov

From: [Monette, DJ](#)
To: [Zelenak, Jim](#)
Cc: [Ivy Allen](#); [Nathan Dexter](#); [Charles Traxler](#); [Garrett Peterson](#); [Jodi Bush](#); [Mary Parkin](#); [Heather Bell](#); [Jonathan Cummings](#)
Subject: Re: Tribal Participation in Lynx Expert Elicitation Workshop
Date: Thursday, October 01, 2015 11:34:25 AM

Great - thanks Jim! I have no comments.

Chuck, Garrett, Ivy & Nathan: If you don't have any edits - do you want to chat at 2:30 pm EST today? I can set up a Google Calendar invite.

Thanks,

DJ

On Thu, Oct 1, 2015 at 1:01 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Draft email to Tribes (send simultaneously to all tribes listed in the Lynx SSA project plan that I forwarded yesterday). Please review and let me know if changes are needed. I will be in a meeting from 11-12 Mountain Time, but will respond to your recommendations and/or edits after that. Conversely if all Tribal Liaisons agree to the content as is or with agreed-upon (among yourselves) changes, please distribute to the Tribes at your earliest convenience.

Thanks,

Jim

Dear Tribal Partners:

The U.S. Fish and Wildlife Service (Service) is conducting a Species Status Assessment (SSA; see attached fact sheet) for the contiguous U.S. distinct population segment (DPS) of the Canada lynx, which is listed as threatened under the Endangered Species Act (ESA). The SSA is intended to provide the biological and scientific underpinnings for all decisions the Service must make in accordance with the ESA, including future recovery planning for the lynx DPS.

The Service jointly respects and values the significant role of Indian Tribes in past and ongoing lynx conservation. We also respect the sovereignty of Tribal governments and our collective Trust responsibility to Tribes. Continuing this effective relationship with interested Tribes and others is essential to achieving recovery of lynx. Therefore, once the lynx SSA is completed, the Service expects to work very closely with those Tribes who wish to participate in the development of Draft and Final Recovery Plans for lynx, and expect to coordinate and/or consult with Tribes throughout this process. This approach demonstrates our commitment to working directly with Tribes to gain significant input, and address Tribal interests and concerns prior to completing a Final Recovery Plan for lynx.

As part of the lynx SSA, we are conducting a structured Expert Elicitation workshop in Minneapolis, Minnesota, on October 13-15, 2015 (see attached information on the hotel where the workshop will be held). We have invited lynx researchers and experts from across the range of the DPS and in southern Canada to address the current status of and threats to lynx in the Lower 48 States, and to assess the viability of each of the lynx populations in the DPS. In addition to lynx experts, we have invited boreal forest ecologists, hare experts, and climate modelers to help us evaluate the current and likely future distribution and condition of lynx and hare habitats.

We are also inviting a small number of observers from interested Tribes, States, and other federal agencies to participate in the workshop. Because of the nature of expert elicitation, and to foster open and candid dialogue

among the experts, it is essential that we minimize the number of other participants at the workshop. However, we have reserved two slots for Tribal observers at the workshop, and we will fill those slots on a first-come/first-serve basis according to who first contacts Jim Zelenak, the Service's species lead for lynx in the Montana Ecological Services Field Office (jim_zelenak@fws.gov, 406-449-5225, ext. 220) expressing a desire and intention to attend the workshop. To ensure equal opportunity to participate, we are sending this electronic invitation out simultaneously to all Tribes within the DPS range. If you are interested in attending the workshop as an observer, please contact Jim at your earliest convenience.

Thank you.

On Thu, Oct 1, 2015 at 9:02 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi All:

I've discussed the conversation we had yesterday with my Field Supervisor, Jodi Bush (copied here), and the lynx SSA Implementation Team/ Workshop facilitators, and all agree that we should extend an invitation to the tribes to participate in the Oct. 13-15 workshop in Minneapolis.

Jodi would like us to offer two slots for in-person participation by tribal members/representatives, and is agreeable to the simultaneous email distribution of an invitation indicating that the first two replies that I receive will fill the two lots (first-come; first-serve basis, as we all discussed yesterday).

I will draft an email next and send it to each of you, and you-all can work out the details of the timing of the simultaneous electronic invitation. I will include a 2-page fact sheet on the SSA process and hotel/venue information. Although we would prefer not to offer travel assistance as part of the broad invitation, if we have tribal folks who express an interest in attending in person, we will certainly offer the same travel assistance that we have offered to other participants.

The workshop facilitators are not agreeable to the other topic we discussed yesterday - the potential to provide a conference line for tribal members who would like to listen in remotely. First, because we will be having many presentations and will be doing work on-screen at the workshop, there's a lot that would not be available to folks on a conference line; second, some of our State partners asked about whether there would be a conference line available to listen in, and we told them no.

That said, we will make the workshop summary and presentations available to any tribes that express an interest, and we will welcome their continued participation in the SSA and subsequent recovery planning efforts.

I'll work on drafting the email and will send that to you as soon as I can.

Let me know if you have questions.

Thanks,

Jim

--

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U.S. Fish and Wildlife Service
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dj_monette@fws.gov

From: [Bush, Jodi](#)
To: [Zelenak, Jim](#)
Subject: Re: Tribal Participation in Lynx Expert Elicitation Workshop
Date: Thursday, October 01, 2015 11:39:51 AM

its fine. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Thu, Oct 1, 2015 at 11:01 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Draft email to Tribes (send simultaneously to all tribes listed in the Lynx SSA project plan that I forwarded yesterday). Please review and let me know if changes are needed. I will be in a meeting from 11-12 Mountain Time, but will respond to your recommendations and/or edits after that. Conversely if all Tribal Liaisons agree to the content as is or with agreed-upon (among yourselves) changes, please distribute to the Tribes at your earliest convenience.

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We are also inviting a small number of observers from interested Tribes, States, and other federal agencies to participate in the workshop. Because of the nature of expert elicitation, and to foster open and candid dialogue among the experts, it is essential that we minimize the number of other participants at the workshop. However,

we have reserved two slots for Tribal observers at the workshop, and we will fill those slots on a first-come/first-serve basis according to who first contacts Jim Zelenak, the Service's species lead for lynx in the Montana Ecological Services Field Office (jim_zelenak@fws.gov, 406-449-5225, ext. 220) expressing a desire and intention to attend the workshop. To ensure equal opportunity to participate, we are sending this electronic invitation out simultaneously to all Tribes within the DPS range. If you are interested in attending the workshop as an observer, please contact Jim at your earliest convenience.

Thank you.

On Thu, Oct 1, 2015 at 9:02 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

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That said, we will make the workshop summary and presentations available to any tribes that express an interest, and we will welcome their continued participation in the SSA and subsequent recovery planning efforts.

I'll work on drafting the email and will send that to you as soon as I can.

Let me know if you have questions.

Thanks,

Jim

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
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(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Erb, John D \(DNR\)](#)
Subject: Re: Reminder: Lynx SSA Coordination Call
Date: Thursday, October 01, 2015 12:29:15 PM

Hi John,

Yes, we are asking Ron to give the status update for lynx in the great Lakes region. I thought I'd mentioned that on the call, but perhaps not.

Jim

On Thu, Oct 1, 2015 at 12:24 PM, Erb, John D (DNR) <john.erb@state.mn.us> wrote:

Hi Jim:

On the call yesterday I recall you indicated 1 expert panel member from each management unit will give a short talk on their thoughts related to lynx status and future in their unit. You gave names for some other units, but don't recall hearing a name for the Great Lakes. I presume that will be Ron Moen, but can you confirm.

Thanks.

John

John Erb, Ph.D.

Furbearer/Wolf Research Scientist

Minnesota DNR

Forest Wildlife Populations and Research Group

1201 E. Hwy 2

Grand Rapids, MN 55744

218-999-7930

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]

Sent: Tuesday, September 29, 2015 5:02 PM

To: bob.broscheid@state.co.us; Jake Ivan - DNR <jake.ivan@state.co.us>; Odell, Eric <eric.odell@state.co.us>; Moore, Virgil <virgil.moore@idfg.idaho.gov>; Dustin Miller (<dustin.miller@osc.idaho.gov> <dustin.miller@osc.idaho.gov>); Joshua Uriarte <Joshua.Uriarte@osc.idaho.gov>; Sallabanks, Rex <rex.sallabanks@idfg.idaho.gov>; Sam Eaton <Sam.Eaton@osc.idaho.gov>; Chandler.woodcock@maine.gov; Vashon, Jennifer <jennifer.vashon@maine.gov>; moritzw@michigan.gov; DNR-Wildlife@michigan.gov; *Commissioner (DNR) <commissioner.DNR@state.mn.us>; Boggess, Ed (DNR) <ed.boggess@state.mn.us>; Baker, Richard (DNR) <richard.baker@state.mn.us>; Erb, John D (DNR) <john.erb@state.mn.us>; jhagener@mt.gov; JTubbs@mt.gov; McDonald, Ken <kmcdonald@mt.gov>; Inman, Bob <bobinman@mt.gov>; Jay Kolbe <jkolbe.fwp@gmail.com>; glenn.normandeau@wildlife.nh.gov; alexandra.sandoval@state.nm.us; patricia.riexinger@dec.ny.gov; curt.melcher@state.or.us; Greg Sheehan <GregSheehan@utah.gov>; Kimberly Hersey <kimberlyasmus@utah.gov>; louis.porter@state.vt.us; mark scott <mark.scott@state.vt.us>; Bernier, Chris <chris.bernier@state.vt.us>; director@dfw.wa.gov; cpl@dnr.wa.gov; Lewis, Jeffrey C (DFW) <Jeffrey.Lewis@dfw.wa.gov>; cathy.stepp@wisconsin.gov; kurt.thiede@wisconsin.gov; scott.talbot@wyo.gov; Bob Lanka <bob.lanka@wyo.gov>; Zack Walker <zack.walker@wyo.gov>; Nichole Cudworth <nichole.cudworth@wyo.gov>; Nick.Wiley@myfwc.com; craig.mclaughlin@state.co.us; Connolly, James <James.Connolly@maine.gov>; bumpa@michigan.gov; kennedyd@michigan.gov; Telander, Paul B (DNR) <Paul.Telander@state.mn.us>; Mark.Ellingwood@wildlife.nh.gov; John.Kanter@wildlife.nh.gov; Jill.Killborn@wildlife.nh.gov; William.Staats@wildlife.nh.gov; Patrick.Tate@wildlife.nh.gov; stewart.liley@state.nm.us; rick.winslow@state.nm.us; Jensen, Paul G (DEC) <paul.jensen@dec.ny.gov>; Tom.Hauge@Wisconsin.gov; Erin.Crain@Wisconsin.gov; Owen.Boyle@Wisconsin.gov; Johnf.olson@Wisconsin.gov; David.MacFarland@Wisconsin.gov; John.White@Wisconsin.gov; NathanM.Roberts@wisconsin.gov; Benjamin.Maletzke@dfw.wa.gov
Cc: Jodi Bush <jodi_bush@fws.gov>; Seth Willey <seth_willey@fws.gov>; Mary Parkin <mary_parkin@fws.gov>; Heather Bell <heather_bell@fws.gov>; Jonathan Cummings <jwcummings@usgs.gov>; Mark McCollough <mark_mccollough@fws.gov>; Tamara Smith <tamara_smith@fws.gov>; Bryon Holt <bryon_holt@fws.gov>; Kurt Broderdorp <kurt_broderdorp@fws.gov>

Subject: Reminder: Lynx SSA Coordination Call

Hi All:

Just a reminder that tomorrow (Wednesday, Sept. 30) from 1 - 2:30 PM Mountain Time, we will hold our 3rd monthly coordination call with State agencies regarding the species status assessment for the Canada lynx DPS.

Call-in: 866-822-7385

Participant passcode: 5396168

If we have failed to include anyone from your agency on this distribution list, please forward this to them.

--

Jim Zelenak, Biologist

U.S. Fish and Wildlife Service

Montana Ecological Services Office

585 Shepard Way, Suite 1

Helena, MT 59601

(406) 449-5225 ext. 220

jim_zelenak@fws.gov

--

Jim Zelenak, Biologist

U.S. Fish and Wildlife Service

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jim_zelenak@fws.gov

From: [Baty, Ross](#)
To: [Zelenak, Jim](#)
Subject: FW: Reminder: Lynx SSA Coordination Call
Date: Thursday, October 01, 2015 1:00:14 PM

Hi Jim,

Were there any high points from this call you might be able to share with me? Notice about the call didn't trickle down to me until this morning. Anything you might share would be helpful. Thanks.

Ross

From: Tubbs, John
Sent: Wednesday, September 30, 2015 8:17 AM
To: Thomas, Shawn; Germann, Sonya
Cc: Yates, Anne
Subject: FW: Reminder: Lynx SSA Coordination Call

Next species up for a decision.

John E. Tubbs, Director
Montana Department of Natural Resources and Conservation
(406) 444-1948

From: "Zelenak, Jim" <jim_zelenak@fws.gov>
Date: Tuesday, September 29, 2015 at 4:02 PM
To: "bob.broscheid@state.co.us" <bob.broscheid@state.co.us>, Jake Ivan - DNR <jake.ivan@state.co.us>, "Odell, Eric" <eric.odell@state.co.us>, "Moore, Virgil" <virgil.moore@idfg.idaho.gov>, "Dustin Miller (dustin.miller@osc.idaho.gov)" <dustin.miller@osc.idaho.gov>, Joshua Uriarte <Joshua.Uriarte@osc.idaho.gov>, "Sallabanks, Rex" <rex.sallabanks@idfg.idaho.gov>, Sam Eaton <Sam.Eaton@osc.idaho.gov>, "Chandler.woodcock@maine.gov" <Chandler.woodcock@maine.gov>, "Vashon, Jennifer" <jennifer.vashon@maine.gov>, "moritzw@michigan.gov" <moritzw@michigan.gov>, "DNR-Wildlife@michigan.gov" <DNR-Wildlife@michigan.gov>, "commissioner.dnr@state.mn.us" <commissioner.dnr@state.mn.us>, "Ed.Boggess@state.mn.us" <Ed.Boggess@state.mn.us>, "Baker, Richard (DNR)" <richard.baker@state.mn.us>, "john.erb@state.mn.us" <john.erb@state.mn.us>, "M. Hagener" <JHagener@mt.gov>, John Tubbs <JTubbs@mt.gov>, "McDonald, Ken" <kmcdonald@mt.gov>, "Inman, Bob" <bobinman@mt.gov>, "Kolbe, Jay" <jkolbe.fwp@gmail.com>, "glenn.normandeau@wildlife.nh.gov" <glenn.normandeau@wildlife.nh.gov>, "alexandra.sandoval@state.nm.us" <alexandra.sandoval@state.nm.us>, "patricia.riexinger@dec.ny.gov" <patricia.riexinger@dec.ny.gov>, "curt.melcher@state.or.us" <curt.melcher@state.or.us>, Greg Sheehan <GregSheehan@utah.gov>, Kimberly Hersey <kimberlyasmus@utah.gov>, "louis.porter@state.vt.us" <louis.porter@state.vt.us>, mark scott <mark.scott@state.vt.us>, "Bernier, Chris" <chris.bernier@state.vt.us>, "director@dfw.wa.gov" <director@dfw.wa.gov>, "cpl@dnr.wa.gov" <cpl@dnr.wa.gov>, "Lewis, Jeffrey C (DFW)" <Jeffrey.Lewis@dfw.wa.gov>, "cathy.stepp@wisconsin.gov" <cathy.stepp@wisconsin.gov>, "kurt.thiede@wisconsin.gov" <kurt.thiede@wisconsin.gov>, "scott.talbot@wyo.gov"

<scott.talbot@wyo.gov>, Bob Lanka <bob.lanka@wyo.gov>, Zack Walker <zack.walker@wyo.gov>, Nichole Cudworth <nichole.cudworth@wyo.gov>, "Nick.Wiley@myfwc.com" <Nick.Wiley@myfwc.com>, "craig.mclaughlin@state.co.us" <craig.mclaughlin@state.co.us>, "Connolly, James" <James.Connolly@maine.gov>, "bumpa@michigan.gov" <bumpa@michigan.gov>, "kennedyd@michigan.gov" <kennedyd@michigan.gov>, "Paul.Telander@state.mn.us" <Paul.Telander@state.mn.us>, "Mark.Ellingwood@wildlife.nh.gov" <Mark.Ellingwood@wildlife.nh.gov>, "John.Kanter@wildlife.nh.gov" <John.Kanter@wildlife.nh.gov>, "Jill.Killborn@wildlife.nh.gov" <Jill.Killborn@wildlife.nh.gov>, "William.Staats@wildlife.nh.gov" <William.Staats@wildlife.nh.gov>, "Patrick.Tate@wildlife.nh.gov" <Patrick.Tate@wildlife.nh.gov>, "stewart.liley@state.nm.us" <stewart.liley@state.nm.us>, "rick.winslow@state.nm.us" <rick.winslow@state.nm.us>, "Jensen, Paul G (DEC)" <paul.jensen@dec.ny.gov>, "Tom.Hauge@Wisconsin.gov" <Tom.Hauge@Wisconsin.gov>, "Erin.Crain@Wisconsin.gov" <Erin.Crain@Wisconsin.gov>, "Owen.Boyle@Wisconsin.gov" <Owen.Boyle@Wisconsin.gov>, "Johnf.olson@Wisconsin.gov" <Johnf.olson@Wisconsin.gov>, "David.MacFarland@Wisconsin.gov" <David.MacFarland@Wisconsin.gov>, "John.White@Wisconsin.gov" <John.White@Wisconsin.gov>, "NathanM.Roberts@wisconsin.gov" <NathanM.Roberts@wisconsin.gov>, "Benjamin.Maletzke@dfw.wa.gov" <Benjamin.Maletzke@dfw.wa.gov>
Cc: Jodi Bush <jodi_bush@fws.gov>, Seth Willey <seth_willey@fws.gov>, Mary Parkin <mary_parkin@fws.gov>, Heather Bell <heather_bell@fws.gov>, Jonathan Cummings <jwcummings@usgs.gov>, Mark McCollough <mark_mccollough@fws.gov>, Tamara Smith <tamara_smith@fws.gov>, Bryon Holt <bryon_holt@fws.gov>, Kurt Broderdorp <kurt_broderdorp@fws.gov>

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jjim_zelenak@fws.gov

From: [Bernier, Chris](#)
To: ["Zelenak, Jim"](#)
Subject: RE: Reminder: Lynx SSA Coordination Call
Date: Thursday, October 01, 2015 1:02:48 PM

Jim,

I missed the conference call yesterday due to unanticipated complications with my schedule. Is there anything in particular I should know or do stemming from the discussions? Thanks.

Chris

Please note new email address effective 7/27/2015



Chris Bernier, Furbearer Project Leader

[phone] 802-885-8833 [fax] 802-885-8890

[email] chris.bernier@vermont.gov

[website] www.vtfishandwildlife.com

Fish & Wildlife Department

100 Mineral Street, Suite 302
Springfield, VT 05156-3168

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]

Sent: Tuesday, September 29, 2015 6:02 PM

To: bob.broscheid@state.co.us; Jake Ivan - DNR; Odell, Eric; Moore, Virgil; Dustin Miller (dustin.miller@osc.idaho.gov); Joshua Uriarte; Sallabanks, Rex; Sam Eaton; Chandler.woodcock@maine.gov; Vashon, Jennifer; moritzw@michigan.gov; DNR-Wildlife@michigan.gov; commissioner.dnr@state.mn.us; Ed.Boggess@state.mn.us; Baker, Richard (DNR); john.erb@state.mn.us; jhagener@mt.gov; JTubbs@mt.gov; McDonald, Ken; Inman, Bob; Jay Kolbe; glenn.normandeau@wildlife.nh.gov; alexandra.sandoval@state.nm.us; patricia.riexinger@dec.ny.gov; curt.melcher@state.or.us; Greg Sheehan; Kimberly Hersey; Porter, Louis; Scott, Mark; Bernier, Chris; director@dfw.wa.gov; cpl@dnr.wa.gov; Lewis, Jeffrey C (DFW); cathy.stepp@wisconsin.gov; kurt.thiede@wisconsin.gov; scott.talbot@wyo.gov; Bob Lanka; Zack Walker; Nichole Cudworth; Nick.Wiley@myfwc.com; craig.mclaughlin@state.co.us; Connolly, James; bumpa@michigan.gov; kennedyd@michigan.gov; Paul.Telander@state.mn.us; Mark.Ellingwood@wildlife.nh.gov; John.Kanter@wildlife.nh.gov; Jill.Killborn@wildlife.nh.gov; William.Staats@wildlife.nh.gov; Patrick.Tate@wildlife.nh.gov; stewart.liley@state.nm.us; rick.winslow@state.nm.us; Jensen, Paul G (DEC); Tom.Hauge@Wisconsin.gov; Erin.Crain@Wisconsin.gov; Owen.Boyle@Wisconsin.gov; Johnf.olson@Wisconsin.gov; David.MacFarland@Wisconsin.gov; John.White@Wisconsin.gov; NathanM.Roberts@wisconsin.gov; Benjamin.Maletzke@dfw.wa.gov

Cc: Jodi Bush; Seth Willey; Mary Parkin; Heather Bell; Jonathan Cummings; Mark McCollough; Tamara Smith; Bryon Holt; Kurt Broderdorp

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jim_zelenak@fws.gov

From: [Kaimy Marks](#)
To: [Sharon Hooley](#); [Barbara Chavez](#); [Jodi Bush](#); [Jim Zelenak](#)
Subject: Lynx Workshop Invitational travelers
Date: Thursday, October 01, 2015 4:22:54 PM

I booked flights for everyone listed in the email below and also made travel auths for a couple that didn't need flights:

Karen Hodges (Canadian, bought her own flight that we'll have to try to reimburse her for!)
Ron Moen (driving and wants mileage reimbursement)

IF there are **others** that are expecting us to pay for travel, I have not heard from them yet.....

From: Kaimy Marks [mailto:kaimy_marks@fws.gov]
Sent: Thursday, October 01, 2015 8:19 AM
To: 'Richason, Austin'
Cc: 'Richard Rock'; elizabeth_mashburn@fws.gov
Subject: RE: Authorization for use of corporate account form
Importance: High

Austin-

Please see attached. I hope to make airline reservations for the following invitational travelers today if possible:

Jeff Bowman
Jacob Ivan
Alexj Siren
Erin Simons-Legaard
Jennifer Vashon
Kevin McKelvey
Benjamin Maletzke
Nichole Cudworth
Jay Kolbe
John Squires

Please let me know if there is anything else you need. I'm on leave tomorrow so hoping I can complete the airline tickets & authorizations today. Do I have to wait until you enter the corporate charge card info into each profile?

Kaimy

From: Richason, Austin [mailto:austin_richason@fws.gov]
Sent: Tuesday, September 29, 2015 3:55 PM
To: Kaimy Marks
Subject: Re: Authorization for use of corporate account form

Yes Kaimy a separate form for each traveler. And yes you sign as requester and Jodi can authorize. Just in case I didn't send this the other day, please see the Corporate card guidance attached.

If an invitational traveler needs airline reservations, the corporate card must be used. If the traveler does NOT need airline reservations, the program travel arranger administering the travel must enter a purchase card into the traveler's profile to pay for the Concur processing fees.

On Tue, Sep 29, 2015 at 2:59 PM, Kaimy Marks <kaimy_marks@fws.gov> wrote:
Hi Austin-

Just clarifying – You need a separate form for each of the invitational travelers? (I'm up to 9, but expecting at least 5 more)

Can I sign as the Requester on these forms? And I assume Jodi Bush (our Field Supervisor) has to sign at Authorizing?

From: Richason, Austin [mailto:austin_richason@fws.gov]
Sent: Friday, September 25, 2015 3:24 PM
To: Kaimy Marks
Subject: Re: FW: letters we sent

Hey Kaimy so for any of these travelers that will be paid per diem by us, we need to create a Concur profile and do the trip in the system with a dummy vendor number. We can get the actual vendor numbers created when FBMS comes back up on 10/9. To create the profiles we will need complete Concur Access Forms for all of the travelers. Also see the attached corp. card guidance

[Click Here](#) for invitational traveler guidance.

[Click Here](#) for Travel Resources including the TDY policy handbook

On Fri, Sep 25, 2015 at 1:53 PM, Kaimy Marks <kaimy_marks@fws.gov> wrote:
Austin-

Attached are the letters that Jim Zelenak and Jodi Bush sent to the attendees. The Word document is the list of attendees, everyone listed in the tables would be invitational travelers.

Kaimy

From: Bush, Jodi [mailto:jodi_bush@fws.gov]
Sent: Friday, September 25, 2015 12:32 PM
To: Kaimy Marks
Subject: letters we sent

one to panelists and one to presenters. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

--

Regards,

Austin Richason
USFWS R6/Budget & Finance
303-236-4453
FAX 303-236-6958
austin_richason@fws.gov

Forms & Guidance can be found at our B&F Sharepoint site.

***For Charge Card [CLICK HERE](#)**

***For Concur Travel [CLICK HERE](#)**

***For Other B&F Functions [CLICK HERE](#)**

From: [Monette, DJ](#)
To: [Zelenak, Jim](#)
Subject: Re: Tribal Participation in Lynx Expert Elicitation Workshop
Date: Friday, October 02, 2015 7:24:32 AM

Ok thanks! I will be sure to tell the NALs.

Thanks,

DJ

On Fri, Oct 2, 2015 at 9:23 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

No, DJ, that is mostly an internal FWS planning document. I recommend not sending it; only the other two.

Let me know if you have questions.

Thanks,

Jim

On Fri, Oct 2, 2015 at 6:44 AM, Monette, DJ <dj_monette@fws.gov> wrote:

Hi Jim,

I know we are supposed to send the SSA fax sheet and hotel info document as attachments in with the e-mail to the Tribes, but do we also send the Canada Lynx Project Plan to Complete a Species Status Assessment, Recovery Plan, and Five-year Review document as well?

Thanks,

DJ

On Thu, Oct 1, 2015 at 3:53 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Me, too. Thanks Garrett.

On Thu, Oct 1, 2015 at 1:43 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:

fine with me. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Thu, Oct 1, 2015 at 1:08 PM, Peterson, Garrett <garrett_peterson@fws.gov> wrote:

See my proposed text at the bottom (in blue).

Dear Tribal Partners:

The U.S. Fish and Wildlife Service (Service) is conducting a Species Status Assessment (SSA; see attached fact sheet) for the contiguous U.S. distinct population segment (DPS) of the Canada lynx, which is listed as threatened under the Endangered Species Act (ESA). The SSA is intended to provide the biological and scientific underpinnings for all decisions the Service must make in accordance with the ESA, including future recovery planning for the lynx DPS.

The Service jointly respects and values the significant role of Indian Tribes in past and ongoing lynx conservation. We also respect the sovereignty of Tribal governments and our collective Trust responsibility to Tribes. Continuing this effective relationship with interested Tribes and others is essential to achieving recovery of lynx. Therefore, once the lynx SSA is completed, the Service expects to work very closely with those Tribes who wish to participate in the development of Draft and Final Recovery Plans for lynx, and expect to coordinate and/or consult with Tribes throughout this process. This approach demonstrates our commitment to working directly with Tribes to gain significant input, and address Tribal interests and concerns prior to completing a Final Recovery Plan for lynx.

As part of the lynx SSA, we are conducting a structured Expert Elicitation workshop in Minneapolis, Minnesota, on October 13-15, 2015 (see attached information on the hotel where the workshop will be held). We have invited lynx researchers and experts from across the range of the DPS and in southern Canada to address the current status of and threats to lynx in the Lower 48 States, and to assess the viability of each of the lynx populations in the DPS. In addition to lynx experts, we have invited boreal forest ecologists, hare experts, and climate modelers to help us evaluate the current and likely future distribution and condition of lynx and hare habitats.

We are also inviting a small number of observers from interested Tribes, States, and other federal agencies to participate in the workshop. Because of the nature of expert elicitation, and to foster open and candid dialogue among the experts, it is essential that we minimize the number of other participants at the workshop. However, we have reserved two slots for Tribal observers at the workshop, and we will fill those slots on a first-come/first-serve basis according to who first contacts Jim Zelenak, the Service's species lead for lynx in the Montana Ecological Services Field Office (jim_zelenak@fws.gov, 406-449-5225, ext. 220) expressing a desire and intention to attend the workshop. To ensure equal opportunity to participate, we are sending this electronic invitation out simultaneously to all Tribes within the DPS range. If you are interested in attending the workshop as an observer, please contact Jim at your earliest convenience.

Due to the limited opportunities for participation at this meeting, we will gladly make the materials and presentations from the meeting available upon request. As the SSA progresses, we'll continue to keep you updated.

Thank you.

--
Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1

Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

--

DJ Monette

U.S. Fish and Wildlife Service

Acting Deputy National Native American Programs Coordinator /

Northeast Region Native American Liaison

300 Westgate Center Drive

Hadley, MA 01035

Office: (413) 253-8662

Cell: (413) 244-4495

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--

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--

DJ Monette

U.S. Fish and Wildlife Service

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300 Westgate Center Drive

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Cell: (413) 244-4495

Fax: (413) 253-8456

dj_monette@fws.gov

From: [Zelenak, Jim](#)
To: [Josh Lawler](#)
Subject: Re: Lynx and climate
Date: Friday, October 02, 2015 7:26:20 AM

I saw kind of late that I'd missed your call. Not sure if I just didn't hear it or if there were phone issues. About that time I was getting my daughter to gymnastics and getting her visiting grandmother settled in to view the proceedings.

Anyway, I'm in the office all day and if you have time, please call at either my office or cell number.

Look forward to talking with you.

Jim

On Thu, Oct 1, 2015 at 5:18 PM, Josh Lawler <jlawler@uw.edu> wrote:

Hi Jim,

I just tried giving you a call on your cell -- but for some reason was unable to leave a message. I'll give you a try again tomorrow afternoon. That said, it sounds like you've got the climate modeling end of things taken care of, which is great. I'd be happy to put you in touch with Chad Wilsey (my former postdoc who did the lynx modeling)-- because he would be the best one to talk to you about his lynx model and population projections. I've cc'ed him here.

And you are right, Big Sky is not at all a bad place to have a meeting.

-Josh

Joshua J. Lawler
Denman Professor of Sustainable Resource Sciences
School of Environmental and Forest Sciences
University of Washington
Box 352100
Seattle, WA 98195
phone: 206.685.4367
fax: 206.685.0790
<http://depts.washington.edu/landecol>
email: jlawler@uw.edu
Skype: jjlawler
Twitter: @jjlawler

On Thu, Oct 1, 2015 at 1:20 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hey Josh,

My cell is [907-978-0734](tel:907-978-0734) (still have Alaska area code though it's been 6 years since I lived there) if you want to try an after-hours call while you are in Big Sky. I usually leave the office between 3:30 and 4 to pick my daughter up from school, but I usually have my cell nearby and would be happy to talk with you.

Cheers!

Jim

On Wed, Sep 30, 2015 at 9:40 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:
Hi Josh,

Thanks for getting back to me. Big Sky is not too a bad place for a meeting, yeah?

I'd like to talk to you about this if possible. It looks like we will have Alexej Siren from U Mass and DOI's Northeast Climate Science Center at the workshop to give a presentation on climate modeling re: snow. However, I would be interested in talking to yo about your post doc working on vegetation impacts, and the possibility of a remote presentation on that topic. We are also talking to Lee Frelich at U Minnesota.

Let me know when you could make a call after your meeting today, tomorrow or Friday.

Thanks.

Jim

On Tue, Sep 29, 2015 at 5:00 PM, Josh Lawler <jlawler@uw.edu> wrote:

Hi Jim,

I got your phone message last week and I apologize for not responding sooner. I couldn't decipher the area code in your message and so haven't been able to reach your cell phone.

I won't be able to make it to Minnesota for your meeting the 13th-15th, but I might be able to present something remotely if the timing worked out and you thought I could provide something useful. It might be good to have a better idea of what you are after. I could, for instance, present projected changes in precipitation falling as snow for a few future time periods as produced by a set of GCMs. I would need to do a bit of work to pull that together, through. I also have a postdoc that has done some population modeling for lynx in the PNW, but he focussed on the potential impact of climate-driven changes in vegetation, not snowpack.

I will check in with some colleagues in the UW Climate Impacts Group to see if any of them have snowpack projections on hand that they could share -- there are likely others better suited than I am to provide you with the info your are looking for.

I'm at a meeting in Big Sky, MT through Friday, but can talk when I return to Seattle on Monday. I could potentially find a time to chat while here too - my cell phone is [206.962.7092](tel:206.962.7092).

-Josh

Joshua J. Lawler
Denman Professor of Sustainable Resource Sciences
School of Environmental and Forest Sciences
University of Washington
Box 352100
Seattle, WA 98195
phone: 206.685.4367
fax: 206.685.0790

<http://depts.washington.edu/landecol>

email: jlawler@uw.edu

Skype: jjlawler

Twitter: @jjlawler

--

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jim_zelenak@fws.gov

From: Belleman, Ann
To: [Hanvey, Gary -FS](#)
Subject: Last day?
Date: Friday, October 02, 2015 8:09:00 AM

Hey Gary - Guessing it's your last day on the FNF and you're extremely busy wrapping up as much as possible. Hopefully your transition to Missoula and the RO goes smoothly.

FYI - you know the FWS's lynx Species Status Assessment expert elicitation panel meeting in Minneapolis in a couple of weeks? They won't let me go - very closed door with few (the SSA core team and maybe a few others) being allowed to attend. Not even for a day! Seems I'm just about out of the lynx loop these days. (Tam Smith was the lynx lead here in MN and it didn't make sense for her to pass it all off to me when she has all the "corporate" knowledge, but I'm paying the price!) Glad Squires will be attending - he's probably the only one attending who understands what's going on w/lynx in WY.

The SSA seems to be more of a viability analysis process. You understand the difficulties associated with that! I'm sure it'll be an interesting meeting and yes, I'm disappointed I can't go - was really hoping to learn a lot. Ha! Can't do that!

Take care and keep in touch!

Ann Belleman
U.S. Fish and Wildlife Service
Minnesota/Wisconsin Field Office Complex
Twin Cities Field Office
4101 American Blvd. E
Bloomington, MN 55425-1665

ann_belleman@fws.gov

(307) 421-5839 (work cell)
(612) 725-3548 (Bloomington, MN)

From: [Parkin, Mary](#)
To: [Zelenak, Jim](#)
Cc: [Heather Bell](#); [Jonathan Cummings](#); [Jodi Bush](#); [Seth Willey](#); [Mark McCollough](#); [Tamara Smith](#); [Bryon Holt](#); [Kurt Broderdorp](#)
Subject: Re: Revised Agenda
Date: Friday, October 02, 2015 9:00:10 AM

Yep, that'll make more sense!

On Fri, Oct 2, 2015 at 10:58 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Yes - I'll make that change and at top just say "Minneapolis, Minnesota" rather than "Bloomington, Minneapolis"?

On Fri, Oct 2, 2015 at 8:46 AM, Parkin, Mary <mary_parkin@fws.gov> wrote:

Looks good to me, Jim. The only thing I see that needs changing is the date in the agenda title, from Oct 13-16 to Oct 13-15.

Thanks,
Mary

On Fri, Oct 2, 2015 at 10:31 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Attached are TRACK and CLEAN versions of the workshop agenda with my changes/edits/comments.

Let me know if anything need clarifying.

--

Jim Zelenak, Biologist
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--

Mary Parkin
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--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
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585 Shepard Way, Suite 1

Helena, MT 59601
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jim_zelenak@fws.gov

--

Mary Parkin
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Email mary_parkin@fws.gov

From: [Zelenak, Jim](#)
To: [Jodi Bush](#)
Subject: Fwd: Lynx and climate
Date: Friday, October 02, 2015 9:10:19 AM

FYI

----- Forwarded message -----

From: **Josh Lawler** <jlawler@uw.edu>
Date: Thu, Oct 1, 2015 at 5:18 PM
Subject: Re: Lynx and climate
To: "Zelenak, Jim" <jim_zelenak@fws.gov>
Cc: "Wilsey, Chad" <cwilsey@audubon.org>

Hi Jim,

I just tried giving you a call on your cell -- but for some reason was unable to leave a message. I'll give you a try again tomorrow afternoon. That said, it sounds like you've got the climate modeling end of things taken care of, which is great. I'd be happy to put you in touch with Chad Wilsey (my former postdoc who did the lynx modeling)-- because he would be the best one to talk to you about his lynx model and population projections. I've cc'ed him here.

And you are right, Big Sky is not at all a bad place to have a meeting.

-Josh

Joshua J. Lawler
Denman Professor of Sustainable Resource Sciences
School of Environmental and Forest Sciences
University of Washington
Box 352100
Seattle, WA 98195
phone: 206.685.4367
fax: 206.685.0790
<http://depts.washington.edu/landecol>
email: jlawler@uw.edu
Skype: jjlawler
Twitter: @jjlawler

On Thu, Oct 1, 2015 at 1:20 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hey Josh,

My cell is [907-978-0734](tel:907-978-0734) (still have Alaska area code though it's been 6 years since I lived there) if you want to try an after-hours call while you are in Big Sky. I usually leave the office between 3:30 and 4 to pick my daughter up from school, but I usually have my cell nearby and would be happy to talk with you.

Cheers!

Jim

On Wed, Sep 30, 2015 at 9:40 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi Josh,

Thanks for getting back to me. Big Sky is not too a bad place for a meeting, yeah?

I'd like to talk to you about this if possible. It looks like we will have Alexej Siren from U Mass and DOI's Northeast Climate Science Center at the workshop to give a presentation on climate modeling re: snow. However, I would be interested in talking to yo about your post doc working on vegetation impacts, and the possibility of a remote presentation on that topic. We are also talking to Lee Frelich at U Minnesota.

Let me know when you could make a call after your meeting today, tomorrow or Friday.

Thanks.

Jim

On Tue, Sep 29, 2015 at 5:00 PM, Josh Lawler <jlawler@uw.edu> wrote:

Hi Jim,

I got your phone message last week and I apologize for not responding sooner. I couldn't decipher the area code in your message and so haven't been able to reach your cell phone.

I won't be able to make it to Minnesota for your meeting the 13th-15th, but I might be able to present something remotely if the timing worked out and you thought I could provide something useful. It might be good to have a better idea of what you are after. I could, for instance, present projected changes in precipitation falling as snow for a few future time periods as produced by a set of GCMs. I would need to do a bit of work to pull that together, through. I also have a postdoc that has done some population modeling for lynx in the PNW, but he focussed on the potential impact of climate-driven changes in vegetation, not snowpack.

I will check in with some colleagues in the UW Climate Impacts Group to see if any of them have snowpack projections on hand that they could share -- there are likely others better suited than I am to provide you with the info your are looking for.

I'm at a meeting in Big Sky, MT through Friday, but can talk when I return to Seattle on Monday. I could potentially find a time to chat while here too - my cell phone is [206.962.7092](tel:206.962.7092).

-Josh

Joshua J. Lawler
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From: [Zelenak, Jim](#)
To: [Monette, DJ](#)
Cc: [Bush, Jodi](#); [Peterson, Garrett](#); [Ivy Allen](#); [Nathan Dexter](#); [Charles Traxler](#); [Mary Parkin](#); [Heather Bell](#); [Jonathan Cummings](#); [Joe Early](#)
Subject: Re: Tribal Participation in Lynx Expert Elicitation Workshop
Date: Friday, October 02, 2015 9:36:25 AM

Thanks, DJ - I just want to reiterate to all the folks who will be sending this message out to our Tribal partners that we (Montana Field Office) want to make sure that only the SSA Fact Sheet and the hotel info are attached. The SSA plan is internal and, although at some point it will be part of the admin. record, we haven't distributed it outside the Service yet and we'd like to keep it internal for now.

Let me know if you have any questions.

Thanks,

Jim

On Fri, Oct 2, 2015 at 7:47 AM, Monette, DJ <dj_monette@fws.gov> wrote:

Hello NALs,

FYI - I just sent everyone (NALs and Jim) a Google Calendar invite to remind you to:

Cut/paste and send the below e-mail message (and INCLUDE the TWO attachments below - SSA Fact Sheet and Hotel Info document) to your respective Tribes at 1:00 pm EST (12:00 CST, 11:00 MST, 10:00 PST) located within the Canada lynx DPS range (refer to the attachment titled: *Canada Lynx Project Plan to Complete a Species Status Assessment, Recovery Plan, and Five-year - DO NOT SEND THIS ATTACHMENT TO THE TRIBES!!!!*).

E-mail Subject: Tribal Participation in Canada Lynx Expert Elicitation Workshop, October 13-15, 2015, being held in Minneapolis, Minnesota

Dear Tribal Partners:

The U.S. Fish and Wildlife Service (Service) is conducting a Species Status Assessment (SSA; see attached fact sheet) for the contiguous U.S. distinct population segment (DPS) of the Canada lynx, which is listed as threatened under the Endangered Species Act (ESA). The SSA is intended to provide the biological and scientific underpinnings for all decisions the Service must make in accordance with the ESA, including future recovery planning for the lynx DPS.

The Service jointly respects and values the significant role of Indian Tribes in past and ongoing lynx conservation. We also respect the sovereignty of Tribal governments and our collective Trust responsibility to Tribes. Continuing this effective relationship with interested Tribes and others is essential to achieving recovery of lynx. Therefore, once the lynx SSA is completed, the Service expects to work very closely with those Tribes who wish to participate in the development of Draft and Final Recovery Plans for lynx, and expect to coordinate and/or consult with Tribes throughout this process. This approach demonstrates

our commitment to working directly with Tribes to gain significant input, and address Tribal interests and concerns prior to completing a Final Recovery Plan for lynx.

As part of the lynx SSA, we are conducting a structured Expert Elicitation workshop in Minneapolis, Minnesota, on October 13-15, 2015 (see attached information on the hotel where the workshop will be held). We have invited lynx researchers and experts from across the range of the DPS and in southern Canada to address the current status of and threats to lynx in the Lower 48 States, and to assess the viability of each of the lynx populations in the DPS. In addition to lynx experts, we have invited boreal forest ecologists, hare experts, and climate modelers to help us evaluate the current and likely future distribution and condition of lynx and hare habitats.

We are also inviting a small number of observers from interested Tribes, States, and other federal agencies to participate in the workshop. Because of the nature of expert elicitation, and to foster open and candid dialogue among the experts, it is essential that we minimize the number of other participants at the workshop. However, **we have reserved two slots for Tribal observers at the workshop**, and **we will fill those slots on a first-come/first-serve basis according to who first contacts Jim Zelenak, the Service's species lead for lynx in the Montana Ecological Services Field Office (jim_zelenak@fws.gov, 406-449-5225, ext. 220) expressing a desire and intention to attend the workshop.** To ensure equal opportunity to participate, we are sending this electronic invitation out simultaneously to all Tribes within the DPS range. If you are interested in attending the workshop as an observer, please contact Jim at your earliest convenience.

Due to the limited opportunities for participation at this meeting, we will gladly make the materials and presentations from the meeting available upon request. As the SSA progresses, we'll continue to keep Tribes updated.

Thank you.

NAL

Thanks,

DJ

On Thu, Oct 1, 2015 at 3:53 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:
Me, too. Thanks Garrett.

On Thu, Oct 1, 2015 at 1:43 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:
fine with me. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
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On Thu, Oct 1, 2015 at 1:08 PM, Peterson, Garrett <garrett_peterson@fws.gov> wrote:
See my proposed text at the bottom (in blue).

Dear Tribal Partners:

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Thank you.

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DJ Monette
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Acting Deputy National Native American Programs Coordinator /
Northeast Region Native American Liaison
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Cell: (413) 244-4495
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jim_zelenak@fws.gov

From: [Bush, Jodi](#)
To: [Phifer, Paul](#)
Subject: Re: Lynx Concern
Date: Friday, October 02, 2015 11:44:31 AM

Will do.

We have talked to Jennifer and understand that there is a bit of contention between the state and Dan. We are going to split the NE time and give half time to both Dan and Jennifer. That way she can add anything she feels is important.

Jim Zelenak (my lead) talked to her at length and I think we are good to move forward.

Love working with 15 states. A lot of fun. JB

Jodi L. Bush
Field Supervisor
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On Fri, Oct 2, 2015 at 11:29 AM, Phifer, Paul <paul_phifer@fws.gov> wrote:

Thanks Jodi. I would appreciate it if you did call Jim. I'm on travel a bunch and it's more efficient if I'm not in the middle. Can you keep me in the loop on meetings and progress as I would like to be more engaged? I know you all sent out materials before, yet I could use some help tracking everything. Thanks, Paul

Paul Phifer, PhD
Assistant Regional Director - Ecological Services
Northeast Region
Dept of the Interior
US Fish and Wildlife Service
413.253.8698 work
413.687.4764 cell

On Fri, Oct 2, 2015 at 11:50 AM, Bush, Jodi <jodi_bush@fws.gov> wrote:

I'm around and am happy to talk.

I would like to clarify a few points though. Jennifer is not being relegated to just the "role of a contributor to Dan's presentation". Nor is Jennifer a secondary member, she is a full member of the expert panel. We have asked that she contribute to Dan's presentation on the overall status of lynx in the NE because Service staff indicated that Dan had a good overall view of this. We expect to ask her for any additional information that she thinks is relevant at the end of the presentation.

This is only a very short presentation at the beginning of the 3 day session which speaks to the status of lynx as we know it. Jennifer's role in the rest of the session will be substantial. She was selected because we do think she has a great deal of experience and knowledge to offer.

In any case I am around today. Jim did not bring up this specific issue on the phone on our state coordination call on

Wednesday but I am happy to speak to him directly if need be.

Thanks for checking in. JB

Jodi L. Bush
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On Fri, Oct 2, 2015 at 8:54 AM, Phifer, Paul <paul_phifer@fws.gov> wrote:
Hi Jodi - I told Jim I would speak with you and get back to him. Are you around today? Cheers, Paul

Paul Phifer, PhD
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----- Forwarded message -----

From: **Connolly, James** <James.Connolly@maine.gov>
Date: Thu, Oct 1, 2015 at 3:30 PM
Subject: Lynx Concern
To: "[Paul Phifer@fws.gov](mailto:Paul_Phifer@fws.gov)" <Paul_Phifer@fws.gov>

Paul, Yesterday on the Lynx SSA update call Jim Zelenak mentioned that Dr. Dan Harrison of the University of Maine would be presenting the overview for the State of Maine on Lynx. While we recognize Dan's abilities and accomplishments, IFW has a lynx expert that we feel should be presenting the overview for Lynx in the State of Maine. The work that Dan Harrison and his students published on Canada lynx, all relied on data collected by IFW. Jennifer was responsible and had oversight on the collection of these data. Jennifer Vashon has been IFW's lead researcher on lynx for years and continues to handle lynx management and participate in policy issues relating to lynx. I have included a brief review of Jen's qualifications at the end of this email. We are not comfortable with Jen being relegated to a role of a contributor to Dan's presentation. At this point Jen has not had any additional contact as to the direction or content of the presentations that will be given. Can you suggest who we might talk with to rectify this issue?

Beyond that there is still concern from a number of states about ensuring adequate state participation in the meeting. Yesterday it was mentioned that there would be a number

of questions that would be asked of the participants at the meeting. I feel it would be helpful for participants to have those questions in advance of the meeting. This would give them time to prepare for the discussion and come with any additional information needed to support their presentation. I also believe that this could be a way to ensure that states that are not present can provide the workshop participants with their state's perspective on these issues even if they are not present in person at the meeting. Giving those questions out to all the states and gathering responses will allow them to have a voice in the process. Other suggestions made yesterday including the timely distribution of the workshop notes, access to any presentations given to the group as background information and an opportunity to review all drafts will also be key to ensuring this effort is viewed as open and fair.

I believe this is the first multi-region large scale effort of this type. As such I think it behooves all of us to make an extra effort to design a process that inspires confidence and transparency. State Fish and Wildlife Agencies have a trust responsibility, management responsibilities, basic data and a unique perspective that is vital to include in the SSA. Finding ways to ensure that all states are fully engaged by their contributions prior to the meeting as well as finding helpful ways for them to participate in the meeting is essential.

I would also like to discuss with you the possibility of holding an SSA workshop in the Northeast. Given the large number of species that Region 5 will be taking the lead on would seem to be a great catalyst for engaging technical staff in an SSA workshop. Building a fuller understanding and knowledge about the SSA process will allow States to participate more fully and productively in the SSA process. In addition I think it can strengthen the relationship between the Service and the states in this area and help make these new reviews proceed more smoothly and produce a sound, science based outcome. From my perspective and experiences with the New England cottontail and our work on the ITP for lynx the more we talk and work together the better the outcome. Jim

Jennifer Vashon:

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James M. Connolly

Director, Bureau of Resource Management

Maine Department of Inland Fisheries & Wildlife

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From: [Bush, Jodi](#)
To: [Phifer, Paul](#)
Subject: Re: Lynx Concern
Date: Friday, October 02, 2015 11:46:56 AM

I called and left a message. Hope this takes care of it. JB

Jodi L. Bush
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Director, Bureau of Resource Management

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From: Zelenak, Jim
To: Monette, DJ
Subject: Re: Tribal Participation in Cananda Lynx Expert Elicitation Workshop, October 13-15, 2015, being held in Minneapolis, Minnesota
Date: Friday, October 02, 2015 1:26:36 PM

That's fine, DJ - thanks. We will definitely provide the follow-up materials to any tribal members who so desire.

On Fri, Oct 2, 2015 at 1:15 PM, Monette, DJ <dj_monette@fws.gov> wrote:

Hi Jim,

I did get a chance to speak with John Sewell (Passamaquoddy Tribe - Indian Township Reservation) this afternoon and he indicated that he would not be able to attend but was interested in the follow-up information. He still may reach out to you.

Thanks,

DJ

On Fri, Oct 2, 2015 at 3:11 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Thanks DJ. We have had no other calls or emails yet.

John has the first slot if he wants it, and I checked with Jodi and she said we can help cover travel costs if he requests/needs it.

If we get a second response, and confirm to attendees, I'll let you know and maybe you all would send out a follow-up that the slots are filled?

Anyway - there doesn't yet seem to be a mad dash to attend.

Jim

On Fri, Oct 2, 2015 at 11:26 AM, Monette, DJ <dj_monette@fws.gov> wrote:

FYI - see below. Here's an interest from the Passamaquoddy Tribe.

Thanks,

DJ

----- Forwarded message -----

From: JOHN SEWELL <johnsewell44@hotmail.com>

Date: Fri, Oct 2, 2015 at 1:25 PM

Subject: Re: Tribal Participation in Cananda Lynx Expert Elicitation Workshop, October 13-15, 2015, being held in Minneapolis, Minnesota

To: "Monette, DJ" <dj_monette@fws.gov>

I'm very interested in this. I know that travel and availability will be difficult for me to attend but I would like the information from this. Thanks.

Sent from my iPhone

On Oct 2, 2015, at 1:00 PM, Monette, DJ <dj_monette@fws.gov> wrote:

Hello Folks,

The U.S. Fish and Wildlife Service (Service) is conducting a Species Status Assessment (SSA; see attached fact sheet) for the contiguous U.S. distinct population segment (DPS) of the Canada lynx, which is listed as threatened under the Endangered Species Act (ESA). The SSA is intended to provide the biological and scientific underpinnings for all decisions the Service must make in accordance with the ESA, including future recovery planning for the lynx DPS.

The Service jointly respects and values the significant role of Indian Tribes in past and ongoing lynx conservation. We also respect the sovereignty of Tribal governments and our collective Trust responsibility to Tribes. Continuing this effective relationship with interested Tribes and others is essential to achieving recovery of lynx. Therefore, once the lynx SSA is completed, the Service expects to work very closely with those Tribes who wish to participate in the development of Draft and Final Recovery Plans for lynx, and expect to coordinate and/or consult with Tribes throughout this process. This approach demonstrates our commitment to working directly with Tribes to gain significant input, and address Tribal interests and concerns prior to completing a Final Recovery Plan for lynx.

As part of the lynx SSA, we are conducting a structured Expert Elicitation workshop in Minneapolis, Minnesota, on October 13-15, 2015 (see attached information on the hotel where the workshop will be held). We have invited lynx researchers and experts from across the range of the DPS and in southern Canada to address the current status of and threats to lynx in the Lower 48 States, and to assess the viability of each of the lynx populations in the DPS. In addition to lynx experts, we have invited boreal forest ecologists, hare experts, and climate modelers to help us evaluate the current and likely future distribution and condition of lynx and hare habitats.

We are also inviting a small number of observers from interested Tribes, States, and other federal agencies to participate in the workshop. Because of the nature of expert elicitation, and to foster open and candid dialogue among the experts, it is essential that we minimize the number of other participants at the workshop. However, **we have reserved two slots for Tribal observers at the workshop**, and **we will fill those slots on a first-come/first-serve basis according to who first contacts Jim Zelenak, the Service's species lead for lynx in the Montana Ecological Services Field Office (jim_zelenak@fws.gov, 406-449-5225, ext. 220) expressing a desire and intention to attend the workshop.** To ensure equal opportunity to participate, we are sending this electronic invitation out simultaneously to all Tribes within the DPS range. If you are interested in attending the workshop as an observer, please contact Jim at your earliest convenience.

Due to the limited opportunities for participation at this meeting, we will gladly make the materials and presentations from the meeting available upon request. As the SSA progresses, we'll continue to keep Tribes updated.

Again, please be sure to contact Jim Zelenak as soon as you can if you are interested in participating.

Thanks,

DJ

--

DJ Monette

U.S. Fish and Wildlife Service

Acting Deputy National Native American Programs
Coordinator /

Northeast Region Native American Liaison

300 Westgate Center Drive

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dj_monette@fws.gov

<ssa fact sheet_draft September 2015 for use in Lynx meeting.pdf>

<Attachment 2 - Hotel Information for Lynx SSA Expert Elicitation
Workshop.pdf>

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From: [Parkin, Mary](#)
To: [Cummings, Jonathan](#)
Cc: [Heather Bell](#); [Jim Zelenak](#)
Subject: Re: Planning questions
Date: Friday, October 02, 2015 1:52:39 PM

Hi Jonathan and all,
I've been consumed by Atl salmon today, so I'm just now turning to the lynx. JWC, I've responded as best I can to your questions (see red text), and let's discuss on Monday. Meanwhile, good weekend to all!
Mary

Some questions to help me facilitate and know how to help craft questions:

- Who is going to write the EE report after the workshop? **If we're talking about meeting notes, would we get a draft from Jason and review/consolidate?**
- Who will be writing the SSA report and deciding how the information is communicated and how much complexity it includes? **I assume this will be written by the core team and reviewed by peer reviewers and us (not to mention upper level managers) -- is that right?**
 - For those individuals, and for current condition of lynx, what are the measurable attributes you want information about? **We should discuss on Monday. This, and the following bullet, are great questions.**
 - Same question, but for future condition
- For what purpose are we building the conceptual models? **I see these as contextual models, so we can determine relationships at various biological levels. Their particular application during the meeting would be to focus the broad discussion. Then, if we could get the experts to identify various pathways that may have an overall effect on viability, we would then determine whether we need to conduct population/spatial modeling. We'd need to determine this at the meeting so that we can elicit the necessary model inputs, then modeling would continue to be thought through after the meeting.**

Some feedback on the conceptual models:

- The redundancy CM needs the GYA population as well (assuming I'm correct that there are 6; NE, MN, WA, Rockies, GYA, & CO) **will add**
- How many resiliency CM will we need?
 - Are the dynamics of each of the 6 populations the same, or are some the same, or are all six different? **I don't really think we'll have this settled until after the DPS-wide and population presentations**
- The ecological factors on the resiliency CM look fine, depending on degree of detail desired.
- The demographic factors include some double counting/redundant boxes. There isn't a right answer correction, but perhaps there is a best one. I don't know what is best because I don't know the species biology or the measurable attributes desired well enough.
 - Despite this I couldn't resist making edits anyway. Attached is an image and mental modeler file. **I didn't add them to the google drive** in case the old version is preferred or needs to be sent to experts for timing issues. **If you want to use this version, make sure to swap out the current google drive version.**
 - I'm not sure just abundance is what is desired (distribution/occupancy rate are other options), or if a female only model suffices (sex ratio sounded stable and known, so just multiply). As edited the double counting is removed so abundance is the sum of the stage classes, and then the stage classes are affected by two rates (survival and recruitment). There were rates between boxes counting the same thing before. **Thanks! That's just the input we need. I haven't had a chance to look at your edits, but will before Monday. Also, yesterday I talked with Jennifer Syzmanski and a few others about a standard demographic conceptual model that we can then tweak. We were looking at the model for the rusty-patch bumblebee, and I mentioned that we should be as consistent as we can with these models for the 3Rs, and then modify for species-specific population dynamics. She agreed, and I think our next modeling discussion can look at this. I'll send along the RPBB for comparison purposes.**

On Thu, Oct 1, 2015 at 12:51 PM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:
Mary asked if I had any follow up thoughts from yesterday's call. I have a call from 2-3 EST today, but can chat briefly about any of this if needed before Monday.

Some questions to help me facilitate and know how to help craft questions:

- Who is going to write the EE report after the workshop?
- Who will be writing the SSA report and deciding how the information is communicated and how much complexity it includes?
 - For those individuals, and for current condition of lynx, what are the measurable attributes you want information about?
 - Same question, but for future condition
- For what purpose are we building the conceptual models?

Some feedback on the conceptual models:

- The redundancy CM needs the GYA population as well (assuming I'm correct that there are 6; NE, MN, WA, Rockies, GYA, & CO)
- How many resiliency CM will we need?
 - Are the dynamics of each of the 6 populations the same, or are some the same, or are all six different?
- The ecological factors on the resiliency CM look fine, depending on degree of detail desired.
- The demographic factors include some double counting/redundant boxes. There isn't a right answer correction, but perhaps there is a best one. I don't know what is best because I don't know the species biology or the measurable attributes desired well enough.
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 - I'm not sure just abundance is what is desired (distribution/occupancy rate are other options), or if a female only model suffices (sex ratio sounded stable and known, so just multiply). As edited the double counting is removed so abundance is the sum of the stage classes, and then the stage classes are affected by two rates (survival and recruitment). There were rates between boxes counting the same thing before.

All for now. I think we're making rapid progress!

Cheers,
Jonathan

--

Jonathan W. Cummings, PhD
Research Ecologist
USGS - Leetown Science Center (remotely located)
jwcummings@usgs.gov

Remote Contact Info:
802-999-8684 - cell
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Dover, NH 03820

--

Mary Parkin

Endangered Species Recovery Coordinator, Northeast Region

U.S. Fish and Wildlife Service, Hadley, MA

Remotely located in Escalante, Utah:

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Street address 145 North Center St, Escalante, UT 84726

Phone 617-417-3331

Email mary_parkin@fws.gov

From: [Miller, Martin](#)
To: [Paul Phifer](#); [Spencer Simon](#)
Subject: Fwd: Lynx Concern
Date: Friday, October 02, 2015 3:13:41 PM

Jim's request seems very reasonable. If we're going to invite State participation, we need to go all in.

----- Forwarded message -----

From: **Connolly, James** <James.Connolly@maine.gov>
Date: Fri, Oct 2, 2015 at 1:28 PM
Subject: RE: Lynx Concern
To: "Phifer, Paul" <paul_phifer@fws.gov>
Cc: Martin Miller <Martin_Miller@fws.gov>, Spencer Simon <Spencer_Simon@fws.gov>

Thank you, I appreciate the help on the lynx SSA. I think the workshop idea in the NE is a great idea. Especially if we have a number of groups looking at different species, it would be nice to have some common understanding between states and the Service. The more opportunities you have to talk and get to work together before any stuff starts flying makes the chances of being successful once you get down to work that much better. Jim

From: Phifer, Paul [mailto:paul_phifer@fws.gov]
Sent: Friday, October 02, 2015 10:54 AM
To: Connolly, James
Cc: Martin Miller; Spencer Simon
Subject: Re: Lynx Concern

Thanks Jim. Let me contact Jodi Bush, the Field Office Supervisor of the MT office to discuss your concerns. I will call her today and get back to you.

I agree on the SSA workshop idea. In fact, we are planning such a process for early next year. We are starting to work with NEAFWA to plan a workshop with all the states in our region to discuss the upcoming post-Multi-district litigation listing workload. MDL expires in 2017 and we want to have the states help us prioritize our listing workload after that and inform them of our new processes, such as SSA.

We are working on an email we will be sending out soon. I'm glad to hear it's an idea you would support.

Thanks, Paul

Paul Phifer, PhD

Assistant Regional Director - Ecological Services

Northeast Region

Dept of the Interior

US Fish and Wildlife Service

413.253.8698 work

413.687.4764 cell

On Thu, Oct 1, 2015 at 3:30 PM, Connolly, James <James.Connolly@maine.gov> wrote:

Paul, Yesterday on the Lynx SSA update call Jim Zelenak mentioned that Dr. Dan Harrison of the University of Maine would be presenting the overview for the State of Maine on Lynx. While we recognize Dan's abilities and accomplishments, IFW has a lynx expert that we feel should be presenting the overview for Lynx in the State of Maine. The work that Dan Harrison and his students published on Canada lynx, all relied on data collected by IFW. Jennifer was responsible and had oversight on the collection of these data. Jennifer Vashon has been IFW's lead researcher on lynx for years and continues to handle lynx management and participate in policy issues relating to lynx. I have included a brief review of Jen's qualifications at the end of this email. We are not comfortable with Jen being relegated to a role of a contributor to Dan's presentation. At this point Jen has not had any additional contact as to the direction or content of the presentations that will be given. Can you suggest who we might talk with to rectify this issue?

Beyond that there is still concern from a number of states about ensuring adequate state participation in the meeting. Yesterday it was mentioned that there would be a number of questions that would be asked of the participants at the meeting. I feel it would be helpful for participants to have those questions in advance of the meeting. This would give them time to prepare for the discussion and come with any additional information needed to support their presentation. I also believe that this could be a way to ensure that states that are not present can provide the workshop participants with their state's perspective on these issues even if they are not present in person at the meeting. Giving those questions out to all the states and gathering responses will allow them to have a voice in the process. Other suggestions made yesterday including the timely distribution of the workshop notes, access to any presentations given to the group as background information and an opportunity to review all drafts will also be key to ensuring this effort is viewed as open and fair.

I believe this is the first multi-region large scale effort of this type. As such I think it behooves all of us to make an extra effort to design a process that inspires confidence and transparency. State Fish and Wildlife Agencies have a trust responsibility, management responsibilities, basic data and a unique perspective that is vital to include in the SSA. Finding ways to ensure that all states are fully engaged by their contributions prior to the meeting as well as finding helpful ways for them to participate in the meeting is essential.

I would also like to discuss with you the possibility of holding an SSA workshop in the Northeast. Given the large number of species that Region 5 will be taking the lead on would seem to be a great catalyst for engaging technical staff in an SSA workshop. Building a fuller understanding and knowledge about the SSA process will allow States to participate more fully and productively in the SSA process. In addition I think it can strengthen the relationship between the Service and the states in this area and help make these new reviews proceed more smoothly and produce a sound, science based outcome. From my perspective and experiences with the New England cottontail and our work on the ITP for lynx the more we talk and work together the better the outcome. Jim

Jennifer Vashon:

- Field Experience: Led IFW's 12-year lynx radio telemetry study (1999-2011), IFW's periodic winter snow-track survey to assess change in occupancy and abundance (2003-2008 and 2015-2017), IFW's response to incidental take of lynx in Maine (1999-present)
- Responsible for tracking road mortalities, credible lynx sightings, and reporting to sister agencies and partners
- Lead author on 2 peer-reviewed lynx journal articles, co-author on 4 peer-reviewed lynx journal articles, lead author on Maine's Lynx Species Assessment, and a peer-review article on role of fisher predation on lynx in prep
- Lead Assessor for IUCN's 2015 Red List Update for Canada Lynx
- Serve on numerous graduate committees at University of Maine and University of Massachusetts re: studies of lynx based on IFW's monitoring of lynx (telemetry data, surveys, take, sightings).

James M. Connolly

Director, Bureau of Resource Management

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--

Martin Miller, Chief, Division of Endangered Species, Northeast Region, U.S. Fish and Wildlife Service, 300 Westgate Center Drive, Hadley, MA 01035, 413-253-8615

From: [Paul Phifer](#)
To: [Connolly, James](#)
Cc: [Martin Miller](#); [Spencer Simon](#)
Subject: Re: Lynx Concern
Date: Friday, October 02, 2015 9:55:43 PM

Jim - Jodi said she called you today. I am on travel next week but call if I can help. Paul

Sent from my iPhone

On Oct 2, 2015, at 1:28 PM, Connolly, James <James.Connolly@maine.gov> wrote:

Thank you, I appreciate the help on the lynx SSA. I think the workshop idea in the NE is a great idea. Especially if we have a number of groups looking at different species, it would be nice to have some common understanding between states and the Service. The more opportunities you have to talk and get to work together before any stuff starts flying makes the chances of being successful once you get down to work that much better. Jim

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Sent: Friday, October 02, 2015 10:54 AM
To: Connolly, James
Cc: Martin Miller; Spencer Simon
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From: [Zelenak, Jim](#)
To: [McCollough, Mark](#)
Subject: Re: Maine status for presentations
Date: Monday, October 05, 2015 7:47:55 AM

Same call-in info, but I don't think we are having a webinar this time.

Jenn told me a little bit about some of the differences of opinion between MDIFW and the U, she also hinted at concerns about use of some of the State's data. She also said, however, that she and Dan can work fine together with no animosity, etc. She also just feels that in terms of the best and most recent info on status/distribution of lynx there that they have better info than the U. Should be some animated discussion at the very least.....

I really wish we had another day for presentations. Regardless, I hope we can find time for Erin to present her information.

I also had a good call with Maletzke, who has been in contact with Naney, and I believe he is having a conference call today with Naney, Koehler, Auby and others to organize his thinking and guide his presentation. I'm glad he's coming.

I will review sample questions and the draft models, as well as the "ground rules" document and try to get those out to experts today or tomorrow. Wish we had a little more time to prepare, but hope we will be organized well enough to get the info we need and to take advantage of this rare opportunity to have all these bright folks in the same room.

Talk to you in a few hours, Mark - glad you can join today.

On Mon, Oct 5, 2015 at 7:35 AM, McCollough, Mark <mark_mccollough@fws.gov> wrote:
Jim:

Thank you for handling this delicate situation last week. I'm sorry that it occurred.

As I indicated vaguely in our last call, there may be differences in opinion between UMaine and MDIFW concerning the current and future status of lynx in Maine. We've discussed this in the past, and now I wish there had been time to discuss further with you last week. I trust that the caliber of the people present will be able to examine the science, and make their best judgement. My hope is that everyone will remain professional and avoid airing dirty laundry.

I emailed Erin this morning and told her to bring her presentation and other data. I met with her last week to view her new analyses. She has modeled lynx habitat throughout the ch area in Maine, which shows some interesting new developments in the distribution of lynx habitat. She also has used the satellite forest change methods used by forestry to project lynx habitat into the future, which should be helpful. I've also asked her to bring her climate change/spruce-fir projections and snow data from the UMaine Climate Change Institute, which I think will add to the information brought by others. I also asked if she could bring any information she is aware of of forest trends in adjacent eastern Canada.

I will be on the call at noon today. Same call-in information?

Mark

On Mon, Oct 5, 2015 at 9:23 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Jodi decided that to give the State of Maine equal time as they requested, instead of Dan presenting for 20 min, he and Jenn will each have 15 minutes to present and 10 minutes for questions/discussion on the two

presentations.

Right now it does not look like we have room or time on the agenda for a separate presentation by Erin - we may just have to rely on her for supplemental input to the Maine presentation and/or the climate/boreal forest talks.

I welcome your thoughts on this.

As for Jenn and Dan - I had a phone conversation with Jenn, and she is agreeable to way we have split time for the Maine update. You might want to touch base with Dan and let him know that the State cried foul a little bit and we (Service/R6/MTFO) wanted to make sure no one is put out.

Hope all is well there.

On Mon, Oct 5, 2015 at 6:06 AM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Jim:

I am on annual leave, but will try to be on the call today at noon.

I saw your email concerning State of Maine bruised feelings and need to present at the workshop.

The revised agenda shows Harrison and Vashon doing the Maine presentation. Do both know they are sharing a 20 minute space or are each presenting for 20 minutes? Do Laury or I need to manage the situation with UMaine at this end? When is Erin Simons-Legaard presenting?

Thanks, Mark

--

Mark McCollough, Ph.D.
Endangered Species Specialist
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jim_zelenak@fws.gov

From: [McCollough, Mark](#)
To: [Jim Zelenak](#); [Laury Zicari](#)
Subject: Maine status for presentations
Date: Monday, October 05, 2015 8:06:08 AM

Jim:

I am on annual leave, but will try to be on the call today at noon.

I saw your email concerning State of Maine bruised feelings and need to present at the workshop.

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Thanks, Mark

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mark_mccollough@fws.gov

From: [Kaimy Marks](#)
To: [Jodi Bush](#); [Jim Zelenak](#)
Cc: [Sharon Hooley](#)
Subject: FW: MN Lynx Meeting.
Date: Monday, October 05, 2015 8:09:01 AM
Attachments: [image001.png](#)
[image002.png](#)

Can I do one more invitational traveler this week?

From: Schwartz, Michael K -FS [mailto:michaelkschwartz@fs.fed.us]
Sent: Thursday, October 01, 2015 8:48 PM
To: kaimy_marks@fws.gov
Subject: MN Lynx Meeting.

Hi Kaimy,

I talked with John Squires this evening. I am going to be able to attend the USFWS meeting in Minnesota. Unfortunately, I can only come on Tuesday and need to leave Wednesday late afternoon. Can USFWS provide me with an airline ticket? IF so, I would like the same arriving flight as John Squires and Kevin McKelvey, and a flight back the next afternoon (probably the same flight they are taking, but for me just a day earlier). Sorry to be so late in this request. Unfortunately, I committed to giving a talk on Sunday at TWS in Manitoba and need to get home before I go there. I'm around tomorrow if there are any questions. Thank you for helping me put this together.

Sincerely,

Mike



Michael K. Schwartz, Ph.D.
Director

Forest Service
National Genomics Center for Wildlife and Fish Conservation
<http://www.fs.fed.us/research/genomics-center/>

p: +1 406.542.4161
e: michaelkschwartz@fs.fed.us

800 E. Beckwith Ave.
Missoula, MT 59801
www.fs.fed.us



Caring for the land and serving people

From: [Bush, Jodi](#)
To: [Kaimy Marks](#)
Cc: [Jim Zelenak](#); [Sharon Hooley](#)
Subject: Re: FW: MN Lynx Meeting.
Date: Monday, October 05, 2015 8:42:54 AM
Attachments: [image002.png](#)
[image001.png](#)

fine with us...JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
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(406) 449-5225, ext.205

On Mon, Oct 5, 2015 at 8:08 AM, Kaimy Marks <kaimy_marks@fws.gov> wrote:

Can I do one more invitational traveler this week?

From: Schwartz, Michael K -FS [mailto:michaelkschwartz@fs.fed.us]
Sent: Thursday, October 01, 2015 8:48 PM
To: kaimy_marks@fws.gov
Subject: MN Lynx Meeting.

Hi Kaimy,

I talked with John Squires this evening. I am going to be able to attend the USFWS meeting in Minnesota. Unfortunately, I can only come on Tuesday and need to leave Wednesday late afternoon. Can USFWS provide me with an airline ticket? IF so, I would like the same arriving flight as John Squires and Kevin McKelvey, and a flight back the next afternoon (probably the same flight they are taking, but for me just a day earlier). Sorry to be so late in this request. Unfortunately, I committed to giving a talk on Sunday at TWS in Manitoba and need to get home before I go there. I'm around tomorrow if there are any questions. Thank you for helping me put this together.

Sincerely,

Mike

Michael K. Schwartz, Ph.D.
Director



Forest Service

National Genomics Center for Wildlife and Fish Conservation

<http://www.fs.fed.us/research/genomics-center/>

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800 E. Beckwith Ave.

Missoula, MT 59801

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Caring for the land and serving people

From: McCollough, Mark
To: [Laury Zicari](#)
Subject: Lynx call at noon today
Date: Monday, October 05, 2015 9:01:53 AM

Laury:

My cell phone does not work here. I've tried calling you this morning and left you a message. Your calendar says that you are at a MEDOT meeting.

Given the turn of events relating to Maine, you are welcome to join our lynx core team call at noon today. I suspect that Jodi Bush will be on the call given similar last-minute events from the State of Montana.

This is the call-in number that we usually use: Phone 877-501-8335 Passcode 9984367 If there is anything different I will email.

It will be a great loss if Dan does not attend the meeting. I don't know if it would help if you called Dan. I could do the same, but want to hear what is discussed at noon.

Knowing that not all the experts can "present" at the meeting next week, I asked Dan and Erin to represent Jen's research as appropriate and to please give the State credit for whatever data are presented. They were both very willing to do this.

I am concerned about could be presented by MDIFW next week. I went over Dan and Erin's data with them last week so understood what would have been presented. I will have no idea what will be presented by MDIFW or their latest interpretations. I don't want to be in the position of being caught off guard and having to contest experimental design of studies and interpretations of lynx status opposite to those the Service believes represent the best available science.

You may want to be part of the call at noon - our last before next week's meeting.

Mark

--

Mark McCollough, Ph.D.
Endangered Species Specialist
Maine Field Office
U. S. Fish and Wildlife Service
17 Godfrey Drive, Suite 2
Orono, ME 04473
Phone 207 866-3344 x115
Cell Phone: 207 944-5709
mark_mccollough@fws.gov

From: [McCollough, Mark](#)
To: [Zelenak, Jim](#); [Laury Zicari](#)
Subject: Re: Maine status for presentations
Date: Monday, October 05, 2015 9:35:53 AM

Jim:

Thank you for handling this delicate situation last week. I'm sorry that it occurred.

As I indicated vaguely in our last call, there may be differences in opinion between UMaine and MDIFW concerning the current and future status of lynx in Maine. We've discussed this in the past, and now I wish there had been time to discuss further with you last week. I trust that the caliber of the people present will be able to examine the science, and make their best judgement. My hope is that everyone will remain professional and avoid airing dirty laundry.

I emailed Erin this morning and told her to bring her presentation and other data. I met with her last week to view her new analyses. She has modeled lynx habitat throughout the ch area in Maine, which shows some interesting new developments in the distribution of lynx habitat. She also has used the satellite forest change methods used by forestry to project lynx habitat into the future, which should be helpful. I've also asked her to bring her climate change/spruce-fir projections and snow data from the UMaine Climate Change Institute, which I think will add to the information brought by others. I also asked if she could bring any information she is aware of of forest trends in adjacent eastern Canada.

I will be on the call at noon today. Same call-in information?

Mark

On Mon, Oct 5, 2015 at 9:23 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Jodi decided that to give the State of Maine equal time as they requested, instead of Dan presenting for 20 min, he and Jenn will each have 15 minutes to present and 10 minutes for questions/discussion on the two presentations.

Right now it does not look like we have room or time on the agenda for a separate presentation by Erin - we may just have to rely on her for supplemental input to the Maine presentation and/or the climate/boreal forest talks.

I welcome your thoughts on this.

As for Jenn and Dan - I had a phone conversation with Jenn, and she is agreeable to way we have split time for the Maine update. You might want to touch base with Dan and let him know that the State cried foul a little bit and we (Service/R6/MTFO) wanted to make sure no one is put out.

Hope all is well there.

On Mon, Oct 5, 2015 at 6:06 AM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Jim:

I am on annual leave, but will try to be on the call today at noon.

I saw your email concerning State of Maine bruised feelings and need to present at the workshop.

The revised agenda shows Harrison and Vashon doing the Maine presentation. Do both know they are sharing a 20 minute space or are each presenting for 20 minutes? Do Laury or I need to manage the situation with UMaine at this end? When is Erin Simons-Legaard presenting?

Thanks, Mark

--

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--

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From: [Bush, Jodi](#)
To: [Rick Kahn](#)
Cc: [Nancy Finley](#)
Subject: Re: Lynx meeting
Date: Monday, October 05, 2015 10:05:20 AM

Hi Rick. I would like to hear from you and answer any questions you have. I am in most of the morning today and tomorrow afternoon. Thanks JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Fri, Oct 2, 2015 at 8:25 AM, Bush, Jodi <jodi_bush@fws.gov> wrote:
yes. I am in most of the day. JB

Jodi L. Bush
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Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Thu, Oct 1, 2015 at 5:25 PM, Rick Kahn <rick_kahn@nps.gov> wrote:

Jodi

Been out for a week but back, are you available for a call tomorrow?

Thanks

Rick

Sent from my iPhone

On Oct 1, 2015, at 3:27 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:

Ok Nancy. Let me know if you have questions. JB

Jodi L. Bush
Field Supervisor
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(406) 449-5225, ext.205

On Thu, Oct 1, 2015 at 3:25 PM, Finley, Nancy <nancy_finley@nps.gov> wrote:

My folks have been in the field or on leave, so having trouble getting confirmation. Sorry will try and get back with you soon.

On Thu, Oct 1, 2015 at 3:16 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:

HI folks. I haven't had a confirmation from anyone so wanted to check to see if a decision had been made on NPS attendance. Please let me know so we can get them the relevant information. Thanks. JB

Jodi L. Bush
Field Supervisor
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Helena, MT 59601
(406) 449-5225, ext.205

On Mon, Sep 28, 2015 at 6:24 AM, Finley, Nancy <nancy_finley@nps.gov> wrote:

I will see what I can do.

On Sat, Sep 26, 2015 at 3:08 PM, Glenn Plumb

<glenn_plumb@nps.gov> wrote:

Hi Nancy,

We want to share this upcoming meeting in Minneapolis. No one from our office is able to attend, and perhaps someone lynx-wise from MWR could represent NPS. Perhaps Mark Romanski? Please feel free to coordinate with Jodi and let us know if MWR may attend and Rick wii be available to discuss before and after. Cheers

Glenn Plumb, PhD
NPS Chief Wildlife Biologist
Biological Resource Mgt Division
glenn_plumb@nps.gov
406-570-1947 cell phone

On Sep 25, 2015, at 3:44 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:

Thanks Leslie. Here is some more information. I realize this is short notice but it would be great if someone from the NPS would be able to attend as an observer. Please give me a call with your questions. I've attached a fact sheet about the SSA process and one with hotel information. Thanks again for your help. JB

The U.S. Fish and Wildlife Service (Service) is conducting a species status assessment (SSA) for the contiguous United States distinct population segment (DPS) of the Canada lynx (*Lynx canadensis*), which is listed as threatened under the Endangered Species Act. As part of the SSA, we are partnering with state and other federal agencies in the range of the lynx DPS to convene a facilitated expert elicitation workshop. The objective of the workshop is to assess the current status of and threats to the various DPS populations and to evaluate the DPS's viability under a range of future threat, habitat condition, and climate scenarios.

In the workshop, we will seek to elicit and distill the knowledge, professional judgments, and opinions of experts most familiar with each of the DPS populations to inform our understanding of lynx status, the nature and magnitude of potential threats, and the likelihood of their future persistence.

The workshop will be held October 13-15, 2015 in Minneapolis, Minnesota. In addition to expert panelists, we have invited participation from other experts (boreal forest ecology, hare population dynamics, climate modeling and projections, and the regulatory environment as it pertains to lynx) who will present information for consideration by the expert panel. A small number of federal and state wildlife managers also will be present to observe the process.

A block of rooms has been reserved at the Crowne Plaza Hotel near the Minneapolis Airport (See Attachment 2 for additional hotel information). The workshop will be held in a conference room at the hotel. We will start at 1pm on Tuesday, October 13 and finish up no later than 5pm on Thursday, October 15. The block of rooms, at the government rate of \$140/night, is being held until September 30. Please call the Crowne Plaza Hotel at 952-854-9000 and reference the USFWS to reserve your room. Please note that the cancellation policy for this hotel is 24 hours prior to check-in.

Jodi L. Bush

Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
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(406) 449-5225, ext.205

On Fri, Sep 25, 2015 at 3:35 PM, Leslie, Elaine
<elaine_leslie@nps.gov> wrote:

Hi Jodi

Thanks so much for your call....I am copying Glenn and Rick on this.....Glenn is the Chief Wildlife Biologist for the NPS and Rick is our senior wildlife biologist who has lots of lynx experience.

We would definitely like to be engaged at the national level and loop the parks in. I understand there is a meeting coming up soon in Minnesota....Glenn and Rick, can you please give Jodi a call and get the details?

Thanks so much Jodi!

Elaine

Jodi: 406 449 5225 x205

Elaine F. Leslie
Chief, Biological Resources
Natural Resource Stewardship and Science
National Park Service
970 267-2135



<SSA Fact Sheet.pdf>

<Attachment 2 - Hotel Information for Lynx SSA Expert Elicitation Workshop.pdf>

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Nancy Finley
Associate Regional Director
Natural Resource Stewardship and Science
Midwest Region
National Park Service
402-661-1860
402-378-3081 (cell)

--

Nancy Finley
Associate Regional Director
Natural Resource Stewardship and Science
Midwest Region
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402-661-1860
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From: [Bell, Heather](#)
To: [Jim Zelenak](#)
Subject: Fwd: Requesting assistance from FWS's conservation genetics community of practice for the upcoming SSA on Lynx!
Date: Monday, October 05, 2015 12:57:42 PM

let me know how to answer this!

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
Lakewood, CO 80228
303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>

----- Forwarded message -----

From: **Bartron, Meredith** <meredith_bartron@fws.gov>
Date: Mon, Oct 5, 2015 at 12:31 PM
Subject: Re: Requesting assistance from FWS's conservation genetics community of practice for the upcoming SSA on Lynx!
To: "Bell, Heather" <heather_bell@fws.gov>
Cc: Wade Wilson <wade_wilson@fws.gov>

Hi Heather,

I'm just back from maternity leave and wanted to see if you were still looking for assistance with the lynx issues from the genetics CoP. I don't think I heard back although I may have missed an email or two while out. If there is still a need/interest, please let me know.

Thanks,
Meredith

On Wed, Jul 8, 2015 at 12:48 PM, Bartron, Meredith <meredith_bartron@fws.gov> wrote:

Hi Heather,

Sounds like an interesting topic. Is there a timeline that you could provide for this request? I know the lynx information is a bit more extensive than some of the other species we've reviewed for you recently, so that type of review may take a bit more work and time. Once we know that, then Wade or I can circulate it to our group to see who is available to participate.

Thanks,
Meredith

On Wed, Jul 8, 2015 at 12:09 PM, Bell, Heather <heather_bell@fws.gov> wrote:
Hello Meredith and Wade, Greg has suggested that perhaps one or the other of you might be able to help us out? See email below. We would love to continue to be able to continue to utilize your groups expertise!

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
Lakewood, CO 80228
303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google
Site: <https://sites.google.com/a/fws.gov/rev/>

----- Forwarded message -----

From: **Moyer, Greg** <greg_moyer@fws.gov>
Date: Wed, Jul 8, 2015 at 8:57 AM
Subject: Re: Requesting assistance from FWS's conservation genetics community of practice for the upcoming SSA on Lynx!
To: "Bell, Heather" <heather_bell@fws.gov>

Hi Heather,

I'd love to help, but I am leaving the Service for an academic job - I start in a few weeks. I can still assist, but unfortunately I'd have to ask for some type of monetary compensation (unless the time commitment is small). Alternatively, you could contact Meredith Barton (may be on maternity leave soon) or Wade Wilson who are also part of the FWS genetics COP.

Its been a real pleasure working with you and others on the SSA's - its nice to see all of our hard work going to something more worthwhile than what was being done in the past. Keep up the good work

Greg

Gregory R Moyer, PhD

Director
Conservation Genetics Laboratory
United States Fish and Wildlife Service

5151 Spring Street
Warm Springs, GA 31830
[Website](#)

P: 706.655.3382 ext 1231
E: Greg_Moyer@fws.gov

On Mon, Jul 6, 2015 at 2:10 PM, Bell, Heather <heather_bell@fws.gov> wrote:

Greg, we are undertaking a Species Status Assessment for the Canadian Lynx in preparation for a 5-year review and, if applicable, recovery planning. The lead for the SSA, Jim Zelanak, believes that some assistance in understanding the genetics aspect of this species, including some recent published and unpublished information, would be very useful. Would you be willing to help us out?

Here is a short blurb he provided on the issue:

"Because lynx within the DPS are at the southern extent of their range, as well as the ranges of boreal forest and snowshoe hares, where the potential for and consequences of genetic constraints may be amplified, we need to evaluate the current and likely future genetic health of lynx populations within the DPS. We request your help in reviewing, interpreting, and summarizing the available genetics literature and data, and identifying resources and experts who might best inform our evaluation of the likelihood and consequences of potential genetic issues that could effect the viability of lynx populations in the Lower 48 (and also southern Canada, which may act as a source for lynx populations within the DPS).

Thanks for your consideration of this request!

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
Lakewood, CO 80228
303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google
Site: <https://sites.google.com/a/fws.gov/rev/>

--

Meredith Bartron, Ph.D.
U.S. Fish and Wildlife Service

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--

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From: [Cummings, Jonathan](#)
To: [Jim Zelenak](#); [Heather Bell](#); [Mary Parkin](#)
Subject: Re: Resiliency CM
Date: Monday, October 05, 2015 1:22:06 PM

Oh, and I left sub-adults in because I thought I read that sub-adults are affected by low hare years more than adults, which is an affect that may need to be separated out to capture the variability in reproductive population size. Let me know if that discussion has been resolved and sub-adults should be removed.

On Mon, Oct 5, 2015 at 3:12 PM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:
I uploaded our resiliency CM edits to the expert materials folder, and put the old ones in a new archive folder.

--

Jonathan W. Cummings, PhD
Research Ecologist
USGS - Leetown Science Center (remotely located)
jwcummings@usgs.gov

Remote Contact Info:
802-999-8684 - cell
243 Locust St
Dover, NH 03820

--

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Research Ecologist
USGS - Leetown Science Center (remotely located)
jwcummings@usgs.gov

Remote Contact Info:
802-999-8684 - cell
243 Locust St
Dover, NH 03820

From: [Zelenak, Jim](#)
To: [Monette, DJ](#)
Cc: [Early, Joe](#); [John Nystedt](#); [Charles Traxler](#); [Garrett Peterson](#); [Ivy Allen](#); [Nathan Dexter](#); [Jodi Bush](#)
Subject: Re: Tribal Participation in Cananda Lynx Expert Elicitation Workshop, October 13-15, 2015, being held in Minneapolis, Minnesota
Date: Monday, October 05, 2015 1:31:29 PM

I think it would be fine if he indicated that the Project Plan is an internal Service guidance document and that it was sent in error.

Probably not too big of a deal.

On Mon, Oct 5, 2015 at 12:33 PM, Monette, DJ <dj_monette@fws.gov> wrote:

Hi Joe,

You were not supposed to send a copy of the Canada Lynx Project Plan to Complete a Species Status Assessment, Recovery Plan, and Five-Year Review document (the one titled: LYNX_Tribal Participation.docx) - this is an internal document. We only wanted the regions to send the fact sheet and the hotel information documents.

Jim: how would you like Joe to handle this? Should he inform the folks that he sent his e-mail to that this document was sent in error - THOUGHTS?

Thanks,

DJ

On Fri, Oct 2, 2015 at 6:34 PM, Early, Joe <joe_early@fws.gov> wrote:

Good Afternoon Everyone:

I am not aware if there is any interest by SW tribes in relation to lynx, but so that this Region is not missed, attached are information in relation to a Species Status Assessment and workshop. If any southwest tribes have an interest, please let me know.

Thank you,
Joe

--

Joseph Early
U.S. Fish & Wildlife Service
Native American Liaison
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500 Gold Ave. SW
Albuquerque, NM 87103
(505) 248-6602
Cell: (505) 274-4523
joe_early@fws.gov

Regional website: <http://www.fws.gov/southwest/NAL/index.html>

National website: <http://www.fws.gov/nativeamerican/>

Hello Folks,

The U.S. Fish and Wildlife Service (Service) is conducting a Species Status Assessment (SSA; see attached fact sheet) for the contiguous U.S. distinct population segment (DPS) of the Canada lynx, which is listed as threatened under the Endangered Species Act (ESA). The SSA is intended to provide the biological and scientific underpinnings for all decisions the Service must make in accordance with the ESA, including future recovery planning for the lynx DPS.

The Service jointly respects and values the significant role of Indian Tribes in past and ongoing lynx conservation. We also respect the sovereignty of Tribal governments and our collective Trust responsibility to Tribes. Continuing this effective relationship with interested Tribes and others is essential to achieving recovery of lynx. Therefore, once the lynx SSA is completed, the Service expects to work very closely with those Tribes who wish to participate in the development of Draft and Final Recovery Plans for lynx, and expect to coordinate and/or consult with Tribes throughout this process. This approach demonstrates our commitment to working directly with Tribes to gain significant input, and address Tribal interests and concerns prior to completing a Final Recovery Plan for lynx.

As part of the lynx SSA, we are conducting a structured Expert Elicitation workshop in Minneapolis, Minnesota, on October 13-15, 2015 (see attached information on the hotel where the workshop will be held). We have invited lynx researchers and experts from across the range of the DPS and in southern Canada to address the current status of and threats to lynx in the Lower 48 States, and to assess the viability of each of the lynx populations in the DPS. In addition to lynx experts, we have invited boreal forest ecologists, hare experts, and climate modelers to help us evaluate the current and likely future distribution and condition of lynx and hare habitats.

We are also inviting a small number of observers from interested Tribes, States, and other federal agencies to participate in the workshop. Because of the nature of expert elicitation, and to foster open and candid dialogue among the experts, it is essential that we minimize the number of other participants at the workshop. However, **we have reserved two slots for Tribal observers at the workshop**, and **we will fill those slots on a first-come/first-serve basis according to who first contacts Jim Zelenak, the Service's species lead for lynx in the Montana Ecological Services Field Office (jim_zelenak@fws.gov, 406-449-5225, ext. 220) expressing a desire and intention to attend the workshop**. To ensure equal opportunity to participate, we are sending this electronic invitation out simultaneously to all Tribes within the DPS range. If you are interested in attending the workshop as an observer, please contact Jim at your earliest convenience.

Due to the limited opportunities for participation at this meeting, we will gladly make the materials and presentations from the meeting available upon request. As the SSA progresses, we'll continue to keep Tribes updated.

Again, please be sure to contact Jim Zelenak as soon as you can if you are interested in participating.

Thanks,

DJ

--

DJ Monette

U.S. Fish and Wildlife Service

Acting Deputy National Native American Programs Coordinator /

Northeast Region Native American Liaison

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(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: Zicari, Laury
To: [Mary Parkin](#)
Subject: any advice for us wrt Dan Harrison's participation in the lynx expert panel
Date: Monday, October 05, 2015 2:39:42 PM

I would be willing to talk to him tomorrow but I am definitely disenfranchised -- no one told me that the switch was planned and no one told Dan or Mark. I am stunned by the rudeness of it all, the lack of sensitivity AND the lack of sensitivity towards a state agency with sometimes dubious scientific credentials. We also do not want Jen to be in a position where SHE is embarrassed tho she has done good work in the more distant past (last published in 2007). She gets really defensive in such situations and her supervisors allow her to act in a most unprofessional manner; Dan doesn't want any part of it. He is the chair of the wildlife department and has been working on hare/lynx for 15 years and we would be lucky to have him present on Maine.

--

Laury Zicari
Field Supervisor
Maine Field Office
17 Godfrey Drive, Suite 2
Orono, ME 04473
207-866-3344 x 1111
Fax 866-3351
Cell 207-949-0561

From: [Parkin, Mary](#)
To: [Cummings, Jonathan](#)
Cc: [Zelenak, Jim](#)
Subject: Re: Species level thoughts
Date: Monday, October 05, 2015 6:59:27 PM

This is really interesting on several fronts. I totally agree, Jonathan, that this species-level model suggests the need for an integrated model at some point in the SSA process. That said, I think we can go ahead and send Jim's version out, both to (1) demonstrate how the 3Rs relate as components of viability, and (2) give the experts for this particular meeting an idea of how and why we think these relationships need to be systematically assessed.

What's striking me about this conceptual modeling effort is the importance of being explicit about the logic (sometimes I think logic is subjective!). What I'm wondering is how much time we should spend at the meeting on more fully developing the models with expert input vs. asking discrete questions that we would then later feed into both conceptual and, as possible and necessary, mathematical models. Jonathan, your ideas would be most helpful in this regard!

Re: a holistic model vs. separate "R" models, I'd love to talk more about how to do this in a practical way. On a really mundane level, I've found the screen size of mentalmodeler to be limiting (not scalable). But if we do develop separate models for each R, as I resorted to, at what level of detail can we ultimately integrate them?

Here's my bottom-line thought:

We should go ahead and send out the species-level and resiliency diagrams, with the changes you've both made.

The only specific change I'd suggest on the species-level model is to add environmental variation, along with stochastic events, to the influences on population viability. I think the resiliency model should go out as is (i.e., with the changes based on today's call and your follow-up email, Jonathan).

On another note, I've gotten voicemails and emails today expressing angst over the Dan Harrison/State of Maine situation. Our Maine Field Office supervisor wants to deal with this in the morning. Jim, how early do you start work tomorrow? I'd like to talk with you before I talk with my folks.

And, talk to you both tomorrow, and I hope you're having a good evening!
Mary

On Mon, Oct 5, 2015 at 6:37 PM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:
I don't have a strong feeling either way, and those effects do impact more than one of the Rs.

Your changes (factors indirectly affecting multiple Rs) point more toward one large model with a species viability output rather than three smaller linked models with separate resiliency, redundancy and representation outputs. This is more a matter of style than substance, so whichever is easier to conceptualize works for me.

On Mon, Oct 5, 2015 at 5:39 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Do these changes make sense to you two?

--

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USGS - Leetown Science Center (remotely located)
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Street address 145 North Center St, Escalante, UT 84726
Phone 617-417-3331
Email mary_parkin@fws.gov

From: McCollough, Mark
To: [Laury Zicari](#)
Subject: Dan's participation
Date: Tuesday, October 06, 2015 7:39:45 AM

Laury:

Here are parts of an email I received from Dan last night. I responded to Dan, but sense that he has made irretrievable decisions concerning his flight reservations, etc.

Thank you for talking to Mary. I suspect that perhaps these offers to Dan may be too little, too late. I tried to explain to Dan why, perhaps, there was not as much planning and information coming to presenters as maybe should have. I know Jim Z. was tied up in litigation then a week at NCTC at a critical time when we should have been communicating with our expert panel. I tried to do everything I could to give Dan and Erin the guidance they needed to develop their presentations. As you know, I spent several hours with each of them last week, provided suggested outlines, and prepared figures and any support they requested.

I do not think that MDIFW or other state representatives will get out of hand in the sense they disrupt the meeting. I am greatly concerned, as Dan is, that the Maine presentation will be agenda-driven and not reflect 15 years of the best available science that has come from both the University and State. Unlike UMaine, it is unlikely that MDIFW will share their presentation with me prior to the workshop, so I may know nothing until the presentation.

Furthermore, all of the expert scientists at the workshop know that Dan was coming and presenting. They will ask what happened - what to say? I don't look forward to providing a truthful answer.

I asked Dan if he would share his power point presentation with Erin. So far, no answer. Maybe this is something you could ask him if you talk with him today.

Finally, Dan is traveling to Hadley this week (?) to present results of his USFWS-funded migratory bird research. Involvement of the RO and news of his refusal to participate in the expert elicitation may cost him professionally. So unfortunate....

I told Dan that I disagreed with his assertion that our lynx meeting will be western-centric. As you know, I lobbied hard to get Dan, Erin, and Jen invited - 3 of 15 invited experts (20%). No other state has this representation. We will certainly lose perspective for the Northeast if Dan's information and knowledge are not present.

Thanks again for talking to Mary. Our conference call is today (Tuesday) at noon. I understand Mary discussed the Maine situation with Jim and others yesterday (Monday).

Mark

Mark,

This was a decision by FWS and they did not ask me for input and distributed the modified agenda and invited Jen to share my presentation time without prior discussion with me. I know this is a tough place for you, but this is FWS' meeting and unfortunately, the agency has cut off both of our legs. I have limited time for travel this month and had previously decided to travel to FWS meeting and cancel out on TWS Winnipeg where we have a presentation on the lynx food habits and I was a session Chair -- I was planning on notifying folks of my cancellation this morning. Instead I was surprised by a phone

message telling me that I was to coordinate with Jen to give a joint lynx population summary and I also received the modified agenda from Jim Zelenak which identified very limited opportunities for eastern participation... Given my diminished role in the lynx meeting, I switched my plane reservation this morning, paid TWS conference registration fees, booked hotel and will be attending the Winnipeg meeting instead, I tried to call you and Laurie to discuss but needed to move on with my decision when I couldn't reach either of you. I couldn't delay until your return because I was going to put other close colleagues in a lurch by missing our lynx food habits presentation and cancelling my involvement as session Chair in Winnipeg.. I talked with Jim Zelenak on the phone and expressed my many concerns about the meeting...So be it.

Maine will have 3 experts present who can fill the minor role that I was asked to fill in a western-driven agenda at the lynx "science" meeting.

I am very confused at the continued underrepresented role of the eastern population in lynx recovery by FWS and of the agency's willingness to let politics creep into the scientific assessment process. I can not afford the time to be a marginal participant and do not appreciate being told on extremely short notice (and when heading out of town for another series of presentations) to integrate my lynx presentation with IFW. FWS will reap what they have sown from the poor planning and mismanagement of this meeting and I am sorry for that.

Enjoy your week away and let's both focus on the things that we can change.

Cheers- Dan

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mark_mccollough@fws.gov

From: Zelenak, Jim
To: Mark McCollough
Subject: Fwd: Dan Harrison
Date: Tuesday, October 06, 2015 8:52:28 AM

FYI.

----- Forwarded message -----

From: **Parkin, Mary** <mary_parkin@fws.gov>
Date: Tue, Oct 6, 2015 at 8:33 AM
Subject: Re: Dan Harrison
To: "Zelenak, Jim" <jim_zelenak@fws.gov>

Not at all!

On Tue, Oct 6, 2015 at 10:31 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

I see mark is on his computer now. Any problem with me forwarding this string to him and checking if he plans to be on the call?

On Tue, Oct 6, 2015 at 8:14 AM, Parkin, Mary <mary_parkin@fws.gov> wrote:

Mark's on leave this week, so not sure he'll be on the call, but I think Laury will, and perhaps Marty or Spencer Simon (acting ARD) might, too. I think the staying on the line approach will work best.

Thanks,
Mary

On Tue, Oct 6, 2015 at 10:11 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

No - you are correct - I thought today was Core, but it is all FWS.... Guess we will discuss same/similar stuff as last week with States (general update on workshop planning, etc. Should we also get into the Maine issues on the call or just note them generally and ask ME/R5 folks to stay on the line after to hash out?

On Tue, Oct 6, 2015 at 8:07 AM, Parkin, Mary <mary_parkin@fws.gov> wrote:

Hi Jim,

I have today as our monthly FWS coordination call during that time slot. Do I need to change it?

Your idea of having Jen go first sounds good. I do know there's a flurry of activity in R5 today in trying to get Dan back on board.

Hope your dog's ok!

Mary

On Tue, Oct 6, 2015 at 10:02 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

I think we do have a core team call at 10-11 Mountain Time.

Perhaps we can ask Laury to Join Mark on the call if possible.

I'm fine offering Dan his full slot/presentation, but I don't think we can then just give Jen 10 minutes. Maybe we need to give them each time, and have Jen go first with a "current distribution/status talk,

then allow Dan to present the bigger picture overview of threats and likely future viability?

On Tue, Oct 6, 2015 at 7:43 AM, Parkin, Mary <mary_parkin@fws.gov> wrote:
Oops, I guess we don't have a core team call today, right?

On Tue, Oct 6, 2015 at 9:42 AM, Parkin, Mary <mary_parkin@fws.gov> wrote:
Hi Jim,

In ES staff meeting this morning, our acting ARD mentioned that he was concerned about the situation with Dr. Harrison and was going to call him to see if he'd reconsider. Laury Zicari also wants to talk with him.

It's clear that R5 is extremely concerned about him withdrawing from the meeting (even though they caused it). Apparently, Jen Vashon has been quite disrespectful to him in past meetings in Maine, and he doesn't want to go toe-to-toe with her on which information to use.

Here's my suggestion. We could informally reinstate Dan's full presentation time of 20 minutes, give Jen her promised 10 minutes, and keep on schedule with their half-hour presentation slot by foregoing the time for questions. Would you be amenable to this? We wouldn't change the agenda -- we'd simply let him know he can give the presentation he'd already prepared.

I also asked our folks, when they talk with Dan, to assure him that we're going to abide by the ground rules, and that civility will be maintained. I also think any bad blood will be diffused by the sheer number of experts at the table.

The concern isn't just the interpersonal dynamics -- MEFO does not think Jen's information is sound.

Give me a call if you'd like to talk further about this, or we can touch base on it during the core team call.

Cheers,
Mary

--

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From: [Zelenak, Jim](#)
To: [Bowman, Jeff \(MNRF\)](#)
Subject: Re: Agenda and other materials for lynx workshop
Date: Tuesday, October 06, 2015 8:56:07 AM

That sounds good, Jeff. I have a conference call from 10-11 Mountain Time but will be around most of the day other than that. glad you will be joining us at the workshop.

Jim

On Mon, Oct 5, 2015 at 12:07 PM, Bowman, Jeff (MNRF) <Jeff.Bowman@ontario.ca> wrote:

Hi Jim,

Got your phone message. My agenda item seems ok to me. I'm madly putting together 2 talks for the upcoming TWS meeting today, as they need to be uploaded this week, but I will aim to give you a call tomorrow to discuss content a little bit.

Thanks,

Jeff

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: October 2, 2015 6:20 PM
To: McKelvey, Kevin -FS; Dan Harrison; Vashon, Jennifer; Ron Moen; Catton, Susan J -FS; Squires, John -FS; Jay Kolbe; Maletzke, Benjamin T (DFW); Jake Ivan - DNR; Bowman, Jeff (MNRF); Jackson, Scott -FS; Schwartz, Michael K -FS; Hodges, Karen; Josh Lawler; frel001@umn.edu; Alexej Siren
Cc: Jodi Bush; Mary Parkin; Heather Bell; Jonathan Cummings; Seth Willey; Justin Shoemaker; Kurt Broderdorp; Bryon Holt; Mark McCollough; Tamara Smith
Subject: Agenda and other materials for lynx workshop

Greetings lynx experts and other presenters!

I've attached the draft agenda for the Oct. 13-15 lynx expert elicitation workshop in Minneapolis. It may be revised slightly as the timing of one or two presentations is still being discussed, but it should give you a feel for what to expect at the workshop.

As you will see, except where there may be several presenters on a given topic or where one presenter will cover several topics or populations, we have assigned half-hour slots to most presentations. This is to include 20 minutes for presentations and 10 minutes for questions and discussion.

I've reached out to most presenters to discuss the topics we hope you will cover. For those presenting the status updates on the individual lynx populations in the DPS, we would like the focus to be on the current versus historic and likely future status and threats to lynx in each particular geographic area (as opposed to updates on specific recent research efforts that otherwise do not address those areas). In addition to presenters, we will welcome discussion/ input from others on the expert panel who are familiar with lynx populations in specific geographic areas.

For all presenters, we ask that you include notes within your presentations, as the presentations themselves will become part of the administrative record as we move forward with completing the SSA report and beginning the recovery planning process. Several of our State, Federal and Tribal partners have also asked that the presentations and other workshop materials be made available, and we hope to honor those requests. After the workshop, we will summarize the notes and proceedings, and we will distribute those to presenters and experts for your review before we distribute them to other interested parties.

I've also attached (1) a one-pager with definitions of the "3 Rs" - Representation, Resiliency and Redundancy - which we consider when evaluating a species' likely viability; (2) a species status assessment (SSA) fact sheet that you may have seen before; and (3) a white paper describing the expert elicitation process and the need and methods to avoid conflicts with the Federal Advisory Committee Act (FACA) and the Administrative Procedures Act (APA).

Please review each of these documents before the workshop.

Next week, I will also send out some examples of the kinds of questions we will be trying address at the workshop, and some draft conceptual models we've worked up to try to illustrate factors/pathways that may influence lynx in the DPS in terms of the 3 Rs.

I'm really looking forward to seeing everyone in a few weeks and learning from your combined experience and expertise. Thanks again for agreeing to help us with the lynx SSA.

Have a great weekend!

Jim

--

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From: [Parkin, Mary](#)
To: [Bell, Heather](#)
Cc: [Zelenak, Jim](#); [Jonathan Cummings](#)
Subject: Re: Ground Rules
Date: Tuesday, October 06, 2015 9:43:49 AM

Go for it!

On Tue, Oct 6, 2015 at 11:28 AM, Bell, Heather <heather_bell@fws.gov> wrote:
looks good to me!

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
Lakewood, CO 80228
303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google
Site: <https://sites.google.com/a/fws.gov/rev/>

On Tue, Oct 6, 2015 at 9:13 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Attached with my changes. There were also a bunch of double spaces mid-sentence in several sentences that I removed. Otherwise I made the changes we discussed and inserted what I hope is clarifying language. Let me know.

If you have no concerns, I will accept changes and then this is ready to go to experts along with CMs and example questions (which I will work on after looking at next two R-models).

--

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From: [Zicari, Laury](#)
To: [Zelenak, Jim](#)
Subject: Re: Mark will be on call at noon
Date: Tuesday, October 06, 2015 9:55:22 AM

Jim -- I believe that Mary Parkin and Marty Miller are planning to stay on the line; Acting ARD Spencer Simon may as well, but I have an appointment to pick up some new glasses that I really need to make. I will keep in touch with them for any way I might help.

On Tue, Oct 6, 2015 at 11:52 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Thanks mark - glad you will be on the call. Perhaps you and Laury and Jodi and I can stay on after others hang-up and discuss some options?

On Tue, Oct 6, 2015 at 9:50 AM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Jim:

This morning is quiet at my mother-in-law's home in Ottawa, so I have been trying to make lemonade from lemons from afar.

I will be on the call at noon. I thought it was Core only. I have to be extremely careful what I say if our administrators are on the call.

I have communicated with Dan numerous times since yesterday morning via email and phone messages (but never did get him directly on the phone). He is upset. He has now committed to alternative travel plans to the TWS meeting and is not coming to the lynx meeting. He has left me/us with little in the way of power point. When we talked last week he had much information from recent graduate students on hare population trends, cycles, lynx diet during periods of high and low hare, a reanalysis of lynx home range response to hare fluctuations, synchronicity with Quebec, etc., etc. However, this is his proprietary research that will not be available to us. Representation of the best available science in the Northeast will be much poorer for this turn of events.

I do not want to presume anything concerning Erin at this time, nor put her in a similar untenable situation. Thus, I am going to wait until after the conference call before calling her to discuss any possibilities.

Mark

--

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From: McCollough, Mark
To: [Erin Simons-Legaard](mailto:erin.simons@maine.edu)
Cc: [Laury Zicari](mailto:Laury.Zicari)
Subject: Re: lynx meeting changes of plans
Date: Tuesday, October 06, 2015 11:03:30 AM

Erin:

Let's hold off talking for a day. Some in the USFWS want to talk with Dan, offer mea culpa's, etc. with hopes he may change his mind.

If there are changes in plans for your possible involvement with the Maine presentation, I think you will hear directly from Jim Zelenak in Helena.

Whatever happens, I am here to help you in any way possible. I encourage you to continue to think about a 20 minute presentation concerning the threats that affect lynx and in particular how changes in forest practices, climate, budworm, changing land ownership, development, anthropogenic sources of mortality, and other "threats" will affect lynx into the future. The future will be a big part of our discussion next week and you've done some good thinking and research along those lines.

Thanks for being patient while we work on this.

Mark

On Tue, Oct 6, 2015 at 12:13 PM, Erin Simons-Legaard <erin.simons@maine.edu> wrote:

Right sorry.

Office is 207.581.2839

Cell is 207.659.0129

If there's time before 1 (i.e. conference call is short) you could call me then.

On Tuesday, October 6, 2015, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Sounds good. I am glad to hear you are still planning to attend.

I will know more after our conference call at noon, but this situation has now involved administrators from both regional offices.

I do not want to presume anything about your involvement and will try to call you after 4:00.

I need your phone number please!!!!!!!!!!!!!!

Mark

On Tue, Oct 6, 2015 at 11:40 AM, Erin Simons-Legaard <erin.simons@maine.edu> wrote:

Hi Mark,

Was just writing you an email in response to your earlier about travel,

which is all set according to Kaimy in Helena.

Yes, I've talked with Dan. He stopped by yesterday to give me the heads up and he's since forwarded me all his emails about the situation. His decision to boycott doesn't change my decision to participate. Our position would assuredly be stronger were he to be there, but c'est la vie.

With regards to the Maine presentation - I'm gonna have to think about that and see what I can dig up from past presentation's from Dan off which to work. The reality is that although I've in a sense lived some of it, aside from the forest change aspect I've spent my time thinking more about lynx future than lynx history in Maine. I don't have Dan's long view perspective on that particular topic.

I will be in lab from 1-4. Do you want to call me @ 4?

Erin

Erin Simons-Legaard
Research Assistant Professor
School of Forest Resources
5755 Nutting Hall
University of Maine
Orono, ME 04469-5755
erin.simons@maine.edu

On Tue, Oct 6, 2015 at 11:21 AM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Erin:

I don't know if you talked directly to Dan in the last day or two, but much has transpired. The email chain sent by Dan a few minutes ago is probably enough to give you a sense of what is going on.

I have a conference call with Jim Zelenak and the USFWS lynx core team at noon today - our last before the expert workshop next week. I know the Maine situation has already caused quite a stir. I will find out more at noon.

Can I call you this afternoon to discuss?. I have been asked whether you would give the Maine summary presentation, however, I do not want to presume anything nor put you in an equally difficult position. Before any further commitments are made on the Maine presentation I want to talk with you.

I hope you are still planning/feel comfortable attending. Please....

I am on vacation this week in Ottawa at Cathy's mom's. **I don't have your phone**

number here. Can you please email me your phone so I can try to talk with you this afternoon?

Thanks, Mark

--

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From: [McCollough, Mark](#)
To: [Laury Zicari](#)
Subject: latest message from Dan
Date: Tuesday, October 06, 2015 11:32:28 AM

Laury:

I am including pertinent sections (below, minus some personal things...) of the latest message from Dan, so that you know where things stand at the call at noon today. I do not want to make similar mistakes with Erin, nor presume anything, so I will not commit her to making the Maine presentation with Jen until I have had a chance to talk with her directly this afternoon (and after we have a chance to discuss with our USFWS peers at noon).

If Dan has not put together a presentation, then it is a lot to ask Erin to pick up the pieces and put Humpty Dumpty back together again in just a few days? As I understand it, I am not supposed to give presentations as a core USFWS team member and I am on annual leave.

This is an untenable situation.

Please do not distribute this further...

thanks, Mark

Mark and Erin,

I have not put together a presentation for the lynx meeting-- I had merely been collecting information in one place and reading new papers, organizing thoughts, and was waiting for the agenda. I had planned to put together all day on Monday but received the agenda and phone message from Jim Z. on Monday AM and decided not to attend. I really wish he had made a real effort to discuss the situation up front rather than telling me what I was supposed to do and distributing the revised agenda without discussing with me first? How does one share a short presentation summarizing 2 decades of work in 10-15 minutes and simultaneously integrate with a presentation from IFW who has repeatedly discredited our published work in favor of their agenda-driven voodoo science? And with no lead time to coordinate in a meaningful fashion (today is my last day in office before the scheduled lynx meeting!). FWS was clearly passing the buck to me on a situation the agency has never had the backbone to manage. I wish the both of you the best in making lemonade out of those lemons that have been dealt to Maine scientists by FWS upper administration and meeting organizers at the Montana field office. A very unfortunate situation on top of generally poor planning and last minute meeting organization.

Attached is a short Powerpoint presentation summarizing lynx historical work in Maine, the pdf slide forwarded to me by Mark based on NH lynx occurrences, and a pdf version of David Mallet's thesis. Erin should have everything else that she needs. I don't want to share the unpublished lynx food habits data at this stage ... I was reluctantly planning to drop the balls at the Manitoba TWS conference in favor of the lynx meeting until the latest unfortunate turn of events. I hope you can both understand the conflicting demands on my time and the need to use it most effectively.

Best wishes for a productive meeting and please pass along my greetings to my colleagues Mike Swartz, Jeff Bowman, Ron Moen, John Squires, and Alexej Siren.

*Best Regards,
Dan*

--

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mark_mccollough@fws.gov

From: [Hodges, Karen](#)
To: [Zelenak, Jim](#)
Subject: RE: Climate and Fire
Date: Tuesday, October 06, 2015 12:15:28 PM

Jim—I just left you a voice mail. I am in office for next 45 minutes if you can call back.

Dr. Karen E. Hodges
Associate Professor, Biology
University of British Columbia Okanagan
Science Building, 1177 Research Road
Kelowna BC V1V 1V7

<http://biol.ok.ubc.ca/faculty/hodges.html>

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: October-06-15 11:13 AM
To: Squires, John -FS; Jake Ivan - DNR; Odell, Eric; Kurt Broderdorp; Jay Kolbe; Maletzke, Benjamin T (DFW); Bryon Holt; Seth Willey; Josh Lawler; Bob Lanka; Ann Belleman; Tyler Abbott; Leslie Ellwood; Jeff Krupka; Michelle Eames; Bob Naney; Hanvey, Gary -FS; Murphy, Kerry M -FS; Nancy Warren; Sartorius, Shawn S -FS; Jackson, Scott -FS; McKelvey, Kevin -FS; Eric Hein; Inman, Bob; Hodges, Karen
Subject: Climate and Fire

Article of interest for lynx habitats in the Rockies, maybe the Cascades, too.

<http://www.pnas.org/content/early/2015/09/29/1500796112.abstract?sid=bacff175-19bc-4e3b-a627-626a78aa037b>

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From: [*Commissioner \(DNR\)](#)
To: [Bush, Jodi](#)
Subject: RE: Reminder: Lynx SSA Coordination Call
Date: Tuesday, October 06, 2015 1:54:39 PM

Thank you for your email. Because I receive many emails every day, I may not be able to answer every one. Be assured, I'll read your email and consider your comments. It is sometimes easier for me to respond to hardcopy letters, so if you'd like to send a letter, please note my mailing address below. Thank you again for your email, and thank you for your concern about Minnesota's natural resources.

Sincerely,

Tom Landwehr
Commissioner
Minnesota Department of Natural Resources
500 Lafayette Road.
St. Paul, MN 55155

"Take a child outdoors today!"

From: [Parkin, Mary](mailto:Parkin.Mary)
To: Zelenak, Jim
Cc: Cummings, Jonathan
Subject: Re: Video?
Date: Tuesday, October 06, 2015 2:45:14 PM

Sounds fine, Jim.

On Tue, Oct 6, 2015 at 4:28 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

It was a question from Tam asking if we'd made a decision whether we wanted to pursue it or not that led me to ask you (and Heather via chat).

I'd like to minimize the number of outstanding challenges at this stage, don't recall any folks asking us to record these, and think it would only be marginally more transparent than what we already have agreed to do by making the workshop notes/summary and the presentation power points available.

Jonathan - do you have time for a quick CM call to discuss some potential changes to resiliency that would be easier for you to make than for me to recreate the whole thing as I did with the others?

On Tue, Oct 6, 2015 at 2:14 PM, Parkin, Mary <mary_parkin@fws.gov> wrote:

I did bring this up with Tam, and she was going to look into the possibility. Jim, could you check in with her to see where we're at with this?

Like Jonathan, I don't want it to become an added complication, but if we can do it without too much hassle, it might be helpful in terms of transparency.

On Tue, Oct 6, 2015 at 3:51 PM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:

I don't know we fully decided. I expressed my opinion toward not filming the workshop as a whole, due to the difficulty of capturing what occurs in this format without an espn style camera set up. Presentations I can go either way with, but with other logistics to get right this would be an added hurdle.

On Tue, Oct 6, 2015 at 3:48 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Did we ever reach a conclusion on whether or not we want to video tape the presentations at the lynx workshop? I'm leaning toward no, because we intend to make the powerpoints with notes available, but I can't recall where we landed on this topic as a group.

--

Jim Zelenak, Biologist
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--

Mary Parkin
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Remotely located in Escalante, Utah:
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Street address 145 North Center St, Escalante, UT 84726
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--

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Email mary_parkin@fws.gov

From: [Parkin, Mary](#)
To: [Zelenak, Jim](#)
Cc: [Cummings, Jonathan](#); [Heather Bell](#)
Subject: Re: Ground Rules
Date: Tuesday, October 06, 2015 2:46:51 PM

I think this is good to go, with thanks for your edits, Jim.

On Tue, Oct 6, 2015 at 4:07 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Attached is a revised redundancy CM with my thoughts/additions, including identifying each of the 6 DPS populations. I've also replaced "invasive species," which isn't really believed to be a threat to lynx, with "insect outbreaks," which could be depending on spatial and temporal extent, and I've added disease (could cover both potential for flea-borne plague in lynx and lynx prey [some lynx introduced into Colorado contracted this after their releases and died from it] and tree diseases affecting boreal and subalpine forest species).

let me know if you have concerns/thoughts.

On Tue, Oct 6, 2015 at 1:38 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Yes - I can see it now in the expert materials folder. thanks.

On Tue, Oct 6, 2015 at 1:23 PM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:

I just shared it again, so hopefully that does it?

On Tue, Oct 6, 2015 at 3:06 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

I'm not seeing it in the expert material folder - though I see species level, redundancy and representation CMs there.

I do see a resiliency CM in the Conceptual Models folder, but that looks like an older version than the one you attached.

On Tue, Oct 6, 2015 at 10:15 AM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:

attached, and in the expert materials folder on google drive

On Tue, Oct 6, 2015 at 11:35 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hey Jonathan,

Where is the current resiliency CM on the drive?

Could you email me the most current?

Thanks.

On Tue, Oct 6, 2015 at 9:15 AM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:

Looks good

On Tue, Oct 6, 2015 at 11:13 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Attached with my changes. There were also a bunch of double spaces mid-sentence in several sentences that I removed. Otherwise I made the changes we discussed and inserted what I hope is clarifying language. Let me know.

If you have no concerns, I will accept changes and then this is ready to go to experts along with CMs and example questions (which I will work on after looking at next two R-models).

--

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Street address 145 North Center St, Escalante, UT 84726

Phone 617-417-3331

Email mary_parkin@fws.gov

From: [Smith, Tamara](#)
To: [Zelenak, Jim](#)
Subject: Re: Video?
Date: Tuesday, October 06, 2015 3:07:36 PM

Sounds good. I'll hold off for now unless I hear otherwise from you.

On Tue, Oct 6, 2015 at 2:56 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

FYI. Heather replied to a chat saying that she thought Mary thought it would be good if it is possible. I'll let Mary know that we think it might be off-putting for presenters and that we don't really need another logistical challenge right now...

Jim

----- Forwarded message -----

From: **Cummings, Jonathan** <jwcummings@usgs.gov>
Date: Tue, Oct 6, 2015 at 1:51 PM
Subject: Re: Video?
To: "Zelenak, Jim" <jim_zelenak@fws.gov>
Cc: Mary Parkin <mary_parkin@fws.gov>

I don't know we fully decided. I expressed my opinion toward not filming the workshop as a whole, due to the difficulty of capturing what occurs in this format without an espn style camera set up. Presentations I can go either way with, but with other logistics to get right this would be an added hurdle.

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Tamara Smith
U.S. Fish and Wildlife Service
Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425
612-725-3548 ext. 2219
612-600-1599 cell

From: [Sue Livingston](mailto:Sue.Livingston@fws.gov)
To: ronald.e.anglin@state.or.us
Cc: rod.w.krahmer@state.or.us
Subject: FW: Lynx SSA letter sent to Oregon Department of Fish and Wildlife
Date: Tuesday, October 06, 2015 3:54:42 PM
Attachments: [8182.03510 15-692_TS15-692.pdf](#)

Hi Ron,

In July we sent the attached letter to Director Melcher regarding coordination with state wildlife agencies on the species status assessment for the Canada Lynx. We have been holding monthly calls with State agencies to provide updates on the progress of the status assessment and to obtain input from the states throughout the process. I was asked by our regional representative on the lynx core team if there were others in ODFW that we should also keep in the loop (e.g. regular email updates on the process, reminders about the coordination calls, etc). If there is someone besides your director that should be on that list, please let me know and I will forward that on.

Thanks Ron.

Sue

From: Sue Livingston [mailto:sue.livingston@fws.gov]
Sent: Thursday, July 16, 2015 10:47 AM
To: 'jmawdsley@fishwildlife.org'; 'Nick.Wiley@myfwc.com'; Gary Frazer; Gary Miller; Bryon Holt; Jim Zelenak
Subject: Lynx SSA letter sent to Oregon Department of Fish and Wildlife

Hello,

Please find attached the letter that was sent to Director Melcher of the Oregon Department of Fish and Wildlife inviting their participation in the lynx SSA process.

Regards,

Sue

~~~~~  
Sue Livingston  
Fish and Wildlife Biologist  
U.S. Fish and Wildlife Service  
Oregon Fish and Wildlife Office  
2600 SE 98th Ave., Suite 100  
Portland, OR 97266  
503-231-6179  
FAX 503-231-6195  
<http://www.fws.gov/oregonfwo/>

**From:** [Ronald Anglin](#)  
**To:** [Sue Livingston](#)  
**Cc:** [rod.w.krahmer@state.or.us](mailto:rod.w.krahmer@state.or.us)  
**Subject:** RE: Lynx SSA letter sent to Oregon Department of Fish and Wildlife  
**Date:** Tuesday, October 06, 2015 4:20:31 PM

---

Hi Sue,

For now keep me in the loop. On the 19th our new carnivore bio will be starting and I will plug him into this conversation.

Thanks

Sent from my Verizon Wireless 4G LTE smartphone

----- Original message -----

**From:** Sue Livingston <[sue\\_livingston@fws.gov](mailto:sue_livingston@fws.gov)>  
**Date:** 10/06/2015 3:55 PM (GMT-08:00)  
**To:** [ronald.e.anglin@state.or.us](mailto:ronald.e.anglin@state.or.us)  
**Cc:** [rod.w.krahmer@state.or.us](mailto:rod.w.krahmer@state.or.us)  
**Subject:** FW: Lynx SSA letter sent to Oregon Department of Fish and Wildlife

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Thanks Ron.

Sue

---

**From:** Sue Livingston [mailto:[sue\\_livingston@fws.gov](mailto:sue_livingston@fws.gov)]  
**Sent:** Thursday, July 16, 2015 10:47 AM  
**To:** '[jmawdsley@fishwildlife.org](mailto:jmawdsley@fishwildlife.org)'; '[Nick.Wiley@myfwc.com](mailto:Nick.Wiley@myfwc.com)'; Gary Frazer; Gary Miller; Bryon Holt; Jim Zelenak  
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Regards,

Sue



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Sue Livingston

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From: [Erin Simons-Legaard](#)
To: [McCollough, Mark](#)
Cc: [Dan Harrison](#); [Laury Zicari](#)
Subject: Re: Share hare time series data for next week?
Date: Tuesday, October 06, 2015 5:35:05 PM

Hi Mark,

I'm glad you brought up unpublished data and sharing. Will there be an expectation that presenters (of whatever kind) share slides they show with the group? I ask because I would like to include a figure or two from the manuscript we have out for review on the lynx retrospective habitat modeling for the 4 mil acre study area, but would rather not have them in circulation yet because of the manuscript status.

Thanks,
Erin

On Tuesday, October 6, 2015, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Dan:

We are discussing what to do for Maine presentations for next week. No decisions have been made.

Would you be willing to share your figure of hare densities over time that you showed me last week (I believe it was for the highest quality early regen habitats)? There was another figure of the hare densities in different silvicultural treatments over time that would be of interest (with caveats concerning sample size of some of the treatments, e.g. shelterwood harvests).

Also, how do you feel about us using figures from Sheryn's thesis on diet during high and low hare cycles?

Do you have an updated table of average hare densities in different silvicultural treatments during high and low hare years or would the table in Shonene's thesis be appropriate?

I realize these are unpublished data, but they represent the best available science to tell the story about hares in Maine. Would you be OK with showing these to the group?

Thanks, Mark

--

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--

Erin Simons-Legaard
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erin.simons@maine.edu

From: [McCollough, Mark](#)
To: [Jim Zelenak](#); [Laury Zicari](#)
Subject: Mark will be on call at noon
Date: Tuesday, October 06, 2015 11:50:12 AM

Jim:

This morning is quiet at my mother-in-law's home in Ottawa, so I have been trying to make lemonade from lemons from afar.

I will be on the call at noon. I thought it was Core only. I have to be extremely careful what I say if our administrators are on the call.

I have communicated with Dan numerous times since yesterday morning via email and phone messages (but never did get him directly on the phone). He is upset. He has now committed to alternative travel plans to the TWS meeting and is not coming to the lynx meeting. He has left me/us with little in the way of power point. When we talked last week he had much information from recent graduate students on hare population trends, cycles, lynx diet during periods of high and low hare, a reanalysis of lynx home range response to hare fluctuations, synchronicity with Quebec, etc., etc. However, this is his proprietary research that will not be available to us. Representation of the best available science in the Northeast will be much poorer for this turn of events.

I do not want to presume anything concerning Erin at this time, nor put her in a similar untenable situation. Thus, I am going to wait until after the conference call before calling her to discuss any possibilities.

Mark

--

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mark_mccollough@fws.gov

From: [Jonathan Mawdsley](#)
To: [Bush, Jodi](#)
Subject: RE: Reminder: Lynx SSA Coordination Call
Date: Wednesday, October 07, 2015 7:17:39 AM

Thanks, Jodi, much appreciated! Let me know if there is anything more I can do to help. Please always feel free to call my cell (202) 997-6628 in case you don't reach me in the office.

Best,
Jonathan

From: Bush, Jodi [mailto:jodi_bush@fws.gov]
Sent: Tuesday, October 06, 2015 5:41 PM
To: Jonathan Mawdsley
Subject: Fwd: Reminder: Lynx SSA Coordination Call

Thanks for the call. Meant to cc you. JB

Jodi L. Bush
Field Supervisor
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585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

----- Forwarded message -----

From: **Bush, Jodi** <jodi_bush@fws.gov>
Date: Tue, Oct 6, 2015 at 1:52 PM
Subject: Fwd: Reminder: Lynx SSA Coordination Call
To: bob.broscheid@state.co.us, "Odell, Eric" <eric.odell@state.co.us>, "Moore, Virgil" <virgil.moore@idfg.idaho.gov>, "Dustin Miller (dustin.miller@osc.idaho.gov)" <dustin.miller@osc.idaho.gov>, Joshua Uriarte <Joshua.Uriarte@osc.idaho.gov>, "Sallabanks, Rex" <rex.sallabanks@idfg.idaho.gov>, Sam Eaton <Sam.Eaton@osc.idaho.gov>, Chandler.woodcock@maine.gov, moritzw@michigan.gov, DNR-Wildlife@michigan.gov, commissioner.dnr@state.mn.us, "Boggess, Ed (DNR)" <Ed.Boggess@state.mn.us>, "Erb, John D (DNR)" <john.erb@state.mn.us>, "Hagener, Jeff" <jhagener@mt.gov>, "Tubbs, John" <JTubbs@mt.gov>, "McDonald, Ken" <kmcdonald@mt.gov>, "Inman, Bob" <bobinman@mt.gov>, glenn.normandeau@wildlife.nh.gov, "Lexi J., Sandoval" <alexandra.sandoval@state.nm.us>, patricia.riexinger@dec.ny.gov, curt.melcher@state.or.us, Greg Sheehan <GregSheehan@utah.gov>, Kimberly Hersey <kimberlyasmus@utah.gov>, louis.porter@state.vt.us, mark scott <mark.scott@state.vt.us>, "Bernier, Chris" <chris.bernier@state.vt.us>, director@dfw.wa.gov, cpl@dnr.wa.gov, "Lewis, Jeffrey C (DFW)" <Jeffrey.Lewis@dfw.wa.gov>, cathy.stepp@wisconsin.gov, "Thiede, Kurt A - DNR" <kurt.thiede@wisconsin.gov>, Bob Lanka <bob.lanka@wyo.gov>, Zack Walker <zack.walker@wyo.gov>, Nick.Wiley@myfwc.com, craig.mclaughlin@state.co.us, "Connolly, James" <James.Connolly@maine.gov>, bumpa@michigan.gov, kennedyd@michigan.gov, "Telander, Paul B (DNR)" <Paul.Telander@state.mn.us>, Mark.Ellingwood@wildlife.nh.gov, John.Kanter@wildlife.nh.gov,

Jill.Killborn@wildlife.nh.gov, William.Staats@wildlife.nh.gov, Patrick.Tate@wildlife.nh.gov, stewart.liley@state.nm.us, rick.winslow@state.nm.us, "Jensen, Paul G (DEC)" <paul.jensen@dec.ny.gov>, "Hauge, Tom M - DNR" <Tom.Hauge@wisconsin.gov>, Erin.Crain@wisconsin.gov, Owen.Boyle@wisconsin.gov, Johnf.olson@wisconsin.gov, David.MacFarland@wisconsin.gov, John.White@wisconsin.gov
Cc: Jim Zelenak <jim_zelenak@fws.gov>, Bryon Holt <bryon_holt@fws.gov>, Tamara Smith <tamara_smith@fws.gov>, Mark McCollough <mark_mccollough@fws.gov>, Kurt Broderdorp <kurt_broderdorp@fws.gov>

State Partners. We wanted to share some materials with you regarding the Lynx workshop next week.

As a reminder the objective of the workshop is to assess the current status of and threats to the various Lynx DPS populations and to evaluate it's viability under a range of future threats, habitat conditions, and climate scenarios. As we lack adequate empirical data on many aspects of lynx population dynamics in the DPS range, we will seek in the workshop to elicit and distill the knowledge, professional judgments, and opinions of experts most familiar with each of the DPS populations to inform our understanding of lynx status, the nature and magnitude of potential threats, and the likelihood of their future persistence.

The SSA process is science based and will not generate any decisions or recommendations. The outcomes of the expert meeting will be one source of information, among other sources, that the Service will use in making recommended determinations under the ESA (including recovery planning). Any information used must meet the appropriate ESA standard for the decision at hand for the best available information. Panelists will be asked to share their scientific expertise during the meeting and not to represent any particular position of an agency or other interested party. To reiterate, this expert meeting is structured so that its primary purpose is to exchange facts and information: not to make decisions.

Attached are (1) a draft agenda; (2) a species status assessment (SSA) fact sheet that you may have seen before; (3) a white paper describing the expert elicitation process and the need and methods to avoid conflicts with the Federal Advisory Committee Act (FACA) and the Administrative Procedures Act (APA); and (4) a one-pager with definitions of the "3 Rs" - Representation, Resiliency and Redundancy - which we consider when evaluating a species' likely viability.

After the workshop, we will summarize the notes and proceedings, presentations and other workshop materials and distribute them to other interested parties.

Thank you for your interest in this process. Remember -this is just the beginning..

Please feel free to give me a call if you have any questions. Thanks. JB

Jodi L. Bush
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(406) 449-5225, ext.205

From: [Bell, Heather](#)
To: [Parkin, Mary](#)
Cc: [Cummings, Jonathan](#); [Jim Zelenak](#)
Subject: Re: Planning questions
Date: Wednesday, October 07, 2015 7:49:55 AM

my two cents in caps

- Who is going to write the EE report after the workshop? I ASSUME THAT THE NOTETAKER LEAD, JUSTIN, WILL HELP TO COMPILE THE NOTES, JIM AND MARY WOULD ADD WHATEVER IS NEEDED FOR CONTEXT.
- Who will be writing the SSA report and deciding how the information is communicated and how much complexity it includes? I ASSUME JIM WOULD with heather and mary....and the core team may be asked to summarize portions???(say current status for each area?!)
 - For those individuals, and for current condition of lynx, what are the measurable attributes you want information about?LETS SETTLE ON THIS TODAY, CHANGE IF EE MEETING BRINGS UP SOMETHING NEW
 - Same question, but for future condition
- For what purpose are we building the conceptual models? TO USE FOR TESTING PREDICTIONS, BOTH NEGATIVE AND POSITIVE (E.G. WHAT SUITE OF RECOVERY ACTIONS MIGHT BEST IMPROVE LYNX 3RS?)

Some feedback on the conceptual models:

- The redundancy CM needs the GYA population as well (assuming I'm correct that there are 6; NE, MN, WA, Rockies, GYA, & CO)
- How many resiliency CM will we need?
 - Are the dynamics of each of the 6 populations the same, or are some the same, or are all six different?
- The ecological factors on the resiliency CM look fine, depending on degree of detail desired.
- The demographic factors include some double counting/redundant boxes. There isn't a right answer correction, but perhaps there is a best one. I don't know what is best because I don't know the species biology or the measurable attributes desired well enough.
 - Despite this I couldn't resist making edits anyway. Attached is an image and mental modeler file. **I didn't add them to the google drive** in case the old version is preferred or needs to be sent to experts for timing issues. **If you want to use this version, make sure to swap out the current google drive version.**
 - I'm not sure just abundance is what is desired (distribution/occupancy rate are other options), or if a female only model suffices (sex ratio sounded stable and known, so just multiply). As edited the double counting is removed so abundance is the sum of the stage classes, and then the stage classes are affected by two rates (survival and recruitment). There were rates between boxes counting the same thing before.

All for now. I think we're making rapid progress!

Cheers,
Jonathan

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Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
Lakewood, CO 80228
303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>

On Thu, Oct 1, 2015 at 12:07 PM, Parkin, Mary <mary_parkin@fws.gov> wrote:

Thanks, Jonathan. I just got off a couple of hours of calls and will look at this now. I'm around all day tomorrow but found out I have to get something out today that will take the rest of the afternoon. As soon as I'm through with that, I'll look at your questions, and we [all or some] can talk tomorrow if need be.

Mary

On Thu, Oct 1, 2015 at 12:51 PM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:

Mary asked if I had any follow up thoughts from yesterday's call. I have a call from 2-3 EST today, but can chat briefly about any of this if needed before Monday.

Some questions to help me facilitate and know how to help craft questions:

- Who is going to write the EE report after the workshop?
- Who will be writing the SSA report and deciding how the information is communicated and how much complexity it includes?
 - For those individuals, and for current condition of lynx, what are the measurable attributes you want information about?
 - Same question, but for future condition
- For what purpose are we building the conceptual models?

Some feedback on the conceptual models:

- The redundancy CM needs the GYA population as well (assuming I'm correct that there are 6; NE, MN, WA, Rockies, GYA, & CO)
- How many resiliency CM will we need?
 - Are the dynamics of each of the 6 populations the same, or are some the same, or are all six different?
- The ecological factors on the resiliency CM look fine, depending on degree of detail desired.
- The demographic factors include some double counting/redundant boxes. There isn't a right answer correction, but perhaps there is a best one. I don't know what is best because I don't know the species biology or the measurable attributes desired well enough.
 - Despite this I couldn't resist making edits anyway. Attached is an image and mental modeler file. **I didn't add them to the google drive** in case the old version is preferred or needs to be sent to experts for timing issues. **If you want to use this version, make sure to swap out the current google drive**

version.

- I'm not sure just abundance is what is desired (distribution/occupancy rate are other options), or if a female only model suffices (sex ratio sounded stable and known, so just multiply). As edited the double counting is removed so abundance is the sum of the stage classes, and then the stage classes are affected by two rates (survival and recruitment). There were rates between boxes counting the same thing before.

All for now. I think we're making rapid progress!

Cheers,
Jonathan

--

Jonathan W. Cummings, PhD
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Street address 145 North Center St, Escalante, UT 84726
Phone 617-417-3331
Email mary_parkin@fws.gov

From: [Zelenak, Jim](#)
To: [Willey, Seth](#)
Subject: Re: new study on wildfire and climate warming
Date: Wednesday, October 07, 2015 9:28:20 AM

Think that's the same one I sent to you and lynx folks yesterday at lunchtime.

On Wed, Oct 7, 2015 at 9:17 AM, Willey, Seth <seth_willey@fws.gov> wrote:
FYI

Seth L. Willey
Acting Regional ESA Chief
Mountain-Prairie Region, USFWS
Seth_Willey@fws.gov
303-236-4257

----- Forwarded message -----

From: Constantino, Maricela <maricela_constantino@fws.gov>
Date: Wed, Oct 7, 2015 at 9:08 AM
Subject: Fwd: new study on wildfire and climate warming
To: Seth Willey <seth_willey@fws.gov>

Maricela Constantino
Endangered Species Biologist
Branch of Recovery and State Grants
Ecological Services - Headquarters Office
U.S. Fish and Wildlife Service

maricela_constantino@fws.gov
571/969-9804

----- Forwarded message -----

From: Green, Nancy <nancy_green@fws.gov>
Date: Wed, Oct 7, 2015 at 10:29 AM
Subject: new study on wildfire and climate warming
To: FWHQ Ecological Services Staff <fwhq_ecological_services_staff@fws.gov>

An interesting study of wildfire in subalpine forests in the Rockies in relation to increases in temperature has just been published in the *Proceedings of the National Academy of Sciences* (PNAS). Using paleo data, the study shows relatively slight warming resulted in a very substantial increase in wildfires, which has implications for effects of current warming.

For those interested, here is a link for a user-friendly summary from ClimateCentral, which also addresses interpreting the results this in relation to this year's western wildfires in other locations:

<http://www.climatecentral.org/news/warming-huge-wildfire-outbreaks-19521>

Link to the published paper: <http://www.pnas.org/content/early/2015/09/29/1500796112.full.pdf>

Nancy

Nancy Green

Ecological Services Program - Climate Change Scientist

U.S. Fish and Wildlife Service Headquarters

5275 Leesburg Pike / Falls Church, VA 22041-3803

703-358-2151 / nancy_green@fws.gov

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Jim Zelenak, Biologist

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(406) 449-5225 ext. 220

jim_zelenak@fws.gov

From: [Cummings, Jonathan](#)
To: [Parkin, Mary](#)
Cc: [Zelenak, Jim](#); [Heather Bell](#); [Jodi Bush](#)
Subject: Re: Concern about sending models
Date: Wednesday, October 07, 2015 12:46:28 PM

This probably going to a longer answer than you'll find immediately helpful, but I don't really have a gut feeling about which way to go, so short answer is probably to follow your gut.

In case you want to incorporate my thoughts into that gut decision, here they are: The objectives we are concerned about here that I'm hearing are 1) preparing the experts to provide the best knowledge that they are able, and 2) avoiding tainting the information they express with policy opinions, or pressure from other parties, and I'm not sure I fully follow, but also 3) falsely representing the state of information the service is using for decision making if these are dispersed prior to receiving feedback.

My guess that is 2) isn't really something that is avoidable, but providing these could give a object to direct that discussion towards. I'm also not sure how 3) is avoided, particularly if you also want to be transparent, because I don't know how decisions about what is shared and when would get made (this is why I stick to modeling and pretend ignorance to these issues, ;-)).

I do think there is some preparatory benefit of jump starting the experts thinking. There is expert elicitation literature that encourages separate pre-meetings to develop conceptual diagrams in preparation for asking elicitation questions about parameters. Given we are combining both into a single quick meeting, I can see benefits to providing experts with as much time to pre-process as is available. Experts often don't like having to pull knowledge from their heads on the spot (and sometimes refuse without being able to refer back to their data or literature they've collected). Given them time to refer to those sources or collect them and bring them with them can be valuable. The down side from the psychology standpoint is that information provided provides an "anchor" that experts tend to adjust from rather than thinking from scratch. So there is an inherent efficiency vs. mental bias aspect that is largely unavoidable. My thought is that soon potentially anchoring information is provided the more time experts have to forget about that information and adjust from it.

So, as i see it the benefit of providing these is getting experts thinking, thinking now, giving time to avoid personal bias, and a visual aid to our process. Downsides are inter-personal biases that may arise, and lost control of what individuals may see what information when.

To Mary's thought. sending only the species level model I think requires the most context. That is a very simplified visual, that only really communicates the 3Rs. if it is viewed as a visual duplication of the 3R fact sheet, that could be helpful, if it is viewed as capturing Lynx biology folks are likely to feel that many many items are left out.

On Wed, Oct 7, 2015 at 2:16 PM, Parkin, Mary <mary_parkin@fws.gov> wrote:

I agree that this is a real concern. I'm just wondering if we could send only the species-level model out just to let folks know that this is how we're structuring our investigation.

If you opt not to send this out, let's make sure we allow enough time to walk through the basic conceptual modeling approach before we begin the elicitation.

Thanks for the heads-up,
Mary

On Wed, Oct 7, 2015 at 1:50 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Jodi and I just talked, and she raised the concern, with which I now find myself in agreement, that there may be more down-side than up to sending the conceptual models out to the lynx experts and other presenters as we discussed. In particular that it may be difficult to provide adequate context in an email and, therefore, encourage folks to dissect them in ways that we don't intend, and for the possibility that some agency folks may distribute them to others with less knowledge/background, and that may lead to the development/preparation of political or policy decisions or arguments ahead of the workshop.

Jodi said unless you-all think there is a very good reason/need to provide the conceptual models ahead of time, that her preference is that we do not.

Let me know your thoughts (quickly if possible).

Thanks.

--

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Dover, NH 03820

From: [Zelenak, Jim](#)
To: [Bell, Heather](#)
Cc: [Mary Parkin](#); [Jonathan Cummings](#); [Jodi Bush](#)
Subject: Re: Concern about sending models
Date: Wednesday, October 07, 2015 1:53:33 PM

I don't disagree, but I did remember here lately that I said this to our experts and presenters when i sent the first batch of info last week:

"Next week, I will also send out some examples of the kinds of questions we will be trying address at the workshop, and some draft conceptual models we've worked up to try to illustrate factors/pathways that may influence lynx in the DPS in terms of the 3 Rs."

Also for consideration is how the need to spend more time introducing and explaining models may impact our already (and increasingly) tight schedule.

Jodi - any additional thoughts?

Could we send the very general "species level" model and maybe the least complicated R-model with enough caveats to not read too much into it, that we will be working through these as a way to identify the most important effects pathways and the areas of greatest uncertainty?

On Wed, Oct 7, 2015 at 1:43 PM, Bell, Heather <heather_bell@fws.gov> wrote:

I have read everyone's thoughts and I say go with the boss. She has the political savvy to give us these kinds of red flags, and this seems like a red flag to her. It will take more time to work folks through the model, so we will just have to be thoughtful about how to do that.

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SSA Framework Team Lead
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at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google
Site: <https://sites.google.com/a/fws.gov/rev/>

On Wed, Oct 7, 2015 at 11:50 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Jodi and I just talked, and she raised the concern, with which I now find myself in agreement, that there may be more down-side than up to sending the conceptual models out to the lynx experts and other presenters as we discussed. In particular that it may be difficult to provide adequate context in an email and, therefore, encourage folks to dissect them in ways that we don't intend, and for the possibility that some agency folks may distribute them to others with less knowledge/background, and that may lead to the development/preparation of political or policy decisions or arguments ahead of the workshop.

Jodi said unless you-all think there is a very good reason/need to provide the conceptual models ahead of time, that her preference is that we do not.

Let me know your thoughts (quickly if possible).

Thanks.

--

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jim_zelenak@fws.gov

From: [Bush, Jodi](#)
To: [Miller, Martin](#)
Cc: [Jim Zelenak](#); [Mark McCollough](#)
Subject: Re: I called Dan yesterday and LM but no response
Date: Wednesday, October 07, 2015 2:00:49 PM

ok. thanks. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
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On Wed, Oct 7, 2015 at 12:53 PM, Miller, Martin <martin_miller@fws.gov> wrote:
He never signed in to the building today. I looked around in case he somehow got in without signing in, but I haven't found him. I guess it's time to work with Erin.

On Wed, Oct 7, 2015 at 2:10 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:
Please go ahead and try to get him to chat about this and reconsider. We can adjust his time, pay for flight, apologize again. Let me know if you get a chance to talk to him.

At this point unless you hear differently we are going to move forward later today to work with Erin. JB

Jodi L. Bush
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(406) 449-5225, ext.205

--

Martin Miller, Chief, Division of Endangered Species, Northeast Region, U.S. Fish and Wildlife Service, 300 Westgate Center Drive, Hadley, MA 01035, 413-253-8615

From: Bush, Jodi
To: [Zelenak, Jim](#)
Cc: [McCollough, Mark](#); [Laury Zicari](#); [Mary Parkin](#)
Subject: Re: contact info for Erin Simons-Legaard
Date: Wednesday, October 07, 2015 2:03:34 PM

Please move forward on this as soon as you can. Thanks JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Wed, Oct 7, 2015 at 1:14 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Thanks Mark.

Jodi and the SSA implementation team are fine with the changes in the agenda you and I discussed, though we have decided not to circulate a revised agenda before the workshop. They also agreed to moving Erin into Dan's vacated slot on the expert panel and making a slot in the "Overview Presentations" part of the agenda for Erin to present her modeling work.

I did not contact Erin this morning and have not done so yet. We wanted to wait to see if Dan would reply to Jodi's voice message from yesterday afternoon and/or discuss the situation with Marty when Dan visited the R5RO today. Jodi has had no reply from him, and based on Marty's last message, Dan seems to not have shown up at the RO today as he was scheduled to do.

Therefore, unless someone suggests otherwise, I will call Erin soon to discuss these changes, and I will later email Jennifer to let her know she will have 20 minutes to provide the status and threats update for the Maine/Northeast lynx population. I don't intend to go into detail with either beyond acknowledging that Dan is unable to participate in the workshop.

Let me know if you have concerns or other thoughts I should consider before contacting Erin and Jennifer.

Thanks.

Jim

On Wed, Oct 7, 2015 at 8:21 AM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Jim:

I appreciate the thought and conversation yesterday on how to resolve concerns in Maine. Please let me know if you talked with Dan and what the outcome may be. I suspect his mind is made up, but I think the overtures we discussed yesterday may salvage relationships, etc.

Thanks for your ideas about identifying Erin as one of the lynx/hare experts and providing an opportunity for her to present Wednesday morning. You will give Erin a call this morning to bring her up to date on these plans and hear her thoughts (and hopefully approval!). Jen would then have the full slot for the Maine presentation.

It will be apparent to all at the workshop that there are differences of opinion concerning the status and future of lynx in Maine. I don't think we can prevent that, nor overlook it. My hope is that these differences can be discussed in a professional manner. Without Dan presenting, the full extent of knowledge on the status of lynx, hares, forestry, and other threats in Maine may not be apparent to all the workshop participants. I trust that we will consider and utilize the full extent of scientific knowledge into our subsequent work. In other words, the workshop is not the final say on the science of understanding lynx, hares, forestry and other threats in the Northeast. I trust that Dan will provide input (perhaps as a peer reviewer) at some point in our process.

Erin's phone numbers:

Office is 207.581.2839

Cell is 207.659.0129

I will give Erin a call towards the end of the day and work with her throughout the remainder of the week.

Drop me an email if there is anything significant I need to know from your discussion with Erin or if you want me to call you.

thanks, Mark

,

--

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jim_zelenak@fws.gov

From: [Bell, Heather](#)
To: [Bush, Jodi](#)
Cc: [Zelenak, Jim](#); [Mary Parkin](#); [Jonathan Cummings](#)
Subject: Re: Concern about sending models
Date: Wednesday, October 07, 2015 2:20:51 PM

THanks Jodi!

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
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On Wed, Oct 7, 2015 at 1:58 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:

Thanks Heather. I do appreciate everyone's point of view and understand the problems that this may make. Given the interest of folks external to our meeting, we will go ahead and hold the models until the meeting.

I also understand this causes problems for our schedule on Tuesday but given that we are starting at one, perhaps the group won't be too upset to work a little longer and go over these.

As we work through the week, remember, at all times I am happy (well not happy but willing) to play the heavy. If we need to go long or shorten a discussion item feel free to place the blame on me.

I am excited about the meeting and the process and have faith in all of you. These hurdles and bumps that we've experienced the last few days will amount to little when all is said and done so please keep that in mind. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601

(406) 449-5225, ext.205

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From: [McCollough, Mark](#)
To: [Zelenak, Jim](#)
Cc: [Laury Zicari](#); [Mary Parkin](#); [Jodi Bush](#)
Subject: Re: contact info for Erin Simons-Legaard
Date: Wednesday, October 07, 2015 2:24:30 PM

Jim and Jodi:

Thanks for accommodating Erin in the agenda as we discussed this morning. I think this is the best plan, given Dan's decision.

I have not heard from Dan today concerning my request for some data, figures, etc.

I told Marty that Dan may be visiting the RO tomorrow (Thursday) and gave him a contact in Migratory Birds to check with.

I will assume Jim will talk with Erin by the end of today (Wednesday) and I will give Erin a call tomorrow to go over her presentation and provide any help I can. I think she will do well.

Mark

On Wed, Oct 7, 2015 at 3:14 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Thanks Mark.

Jodi and the SSA implementation team are fine with the changes in the agenda you and I discussed, though we have decided not to circulate a revised agenda before the workshop. They also agreed to moving Erin into Dan's vacated slot on the expert panel and making a slot in the "Overview Presentations" part of the agenda for Erin to present her modeling work.

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Let me know if you have concerns or other thoughts I should consider before contacting Erin and Jennifer.

Thanks.

Jim

On Wed, Oct 7, 2015 at 8:21 AM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

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From: [Zelenak, Jim](#)
To: [McCollough, Mark](#)
Subject: Re: Mark will talk to Erin tomorrow morning
Date: Wednesday, October 07, 2015 3:47:39 PM

Thank you, Mark, for your willingness to deal with this unfortunate situation while you are supposed to be on leave. I'm very sorry to have had to ask you to do that; very grateful that you were able to do so, and that you are working with Erin.

Let me know if there's anything I can do.

Jim

On Wed, Oct 7, 2015 at 3:44 PM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Thanks Jim. Erin and I agree that forest management (and associated regulations) are the greatest challenge to lynx recovery in Maine. Erin will do a good job covering this topic and will cover her research with climate change, budworm, and spruce-fir in the Acadian region.

We will work together to have what information we can on hare, cycles/fluctuations, especially as it relates to forest management.

Thanks for all the last-minute adjustments.

Mark

On Wed, Oct 7, 2015 at 5:30 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

We had a good call, and she has agreed to take Dan's place on the expert panel and to provide a presentation in the "Overview Presentations" section on Wed. morning after the climate change presentations. The title of her presentation will be "Forest Management and Lynx Habitat Trends." The status and threats update for the Maine/Northeast population will be done by Jennifer Vashon, who I will notify via email that she will now have that slot to herself (so time for a 20-minute presentation and 10 minutes of questions/discussion).

Not sure what we would do now if Dan *did* change his mind....

On Wed, Oct 7, 2015 at 2:39 PM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Jim: I just talked briefly with Erin who said that you had just talked to her. Thanks!

She and I will talk more tomorrow morning, and I will help her as much as I can with preparation from here.

From what Erin said, she thinks Dan is in route to our regional office today. I think his meetings there are tomorrow. I let Marty know. However, Erin and I did not have much hope that would change the outcome.

Mark

--

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jim_zelenak@fws.gov

From: [McCollough, Mark](#)
To: [Zelenak, Jim](#); [Mary Parkin](#)
Subject: Re: unpublished data next week
Date: Wednesday, October 07, 2015 3:51:00 PM

Can we take notes summarizing presentations, but not necessarily require that presenters provide us with their power point presentations to include in the administrative record? This would be similar to scientific conferences where abstracts of the talks are retained as a record, and the unpublished data are used in peer-reviewed papers that are developed later.

I suspect that presenters will want to show and interpret unpublished data, but not necessarily leave a copy of the powerpoint for the Service's administrative record.

I suppose if there were certain key maps, figures, tables, etc. that we could ask the presenters if they were comfortable leaving us with a copy.

Mark

On Wed, Oct 7, 2015 at 5:39 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

I agree. As we discussed on the modeling call today, we should likely remind presenters to think carefully about if/how they may use unpublished data in their presentations, as they will become part of the administrative record, and that we would not be able to withhold them if FOIAed.

On Tue, Oct 6, 2015 at 5:21 PM, Parkin, Mary <mary_parkin@fws.gov> wrote:

This is a valid concern, Mark. Thanks for bringing it to light, and if not earlier, we can discuss on Monday.

Mary

On Tue, Oct 6, 2015 at 7:00 PM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Jim and Mary: Erin asked me if unpublished data would be retained in power points or otherwise shared. I expect this will be a concern of the other experts who will present unpublished data.

Perhaps this topic should be addressed at the opening of the session next week.

I will be in Minneapolis by mid-day on Monday, and am more than willing to help prepare, discuss, etc. in preparation for the next day.

Mark

--

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Mary Parkin

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Email mary_parkin@fws.gov

--

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mark_mccollough@fws.gov

From: [Bush, Jodi](#)
To: [Miller, Martin](#)
Cc: [Jim Zelenak](#); [Mark McCollough](#)
Subject: Re: I called Dan yesterday and LM but no response
Date: Wednesday, October 07, 2015 4:00:49 PM

ok. thanks. JB

Jodi L. Bush
Field Supervisor
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585 Shepard Way, Suite 1
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On Wed, Oct 7, 2015 at 12:53 PM, Miller, Martin <martin_miller@fws.gov> wrote:
He never signed in to the building today. I looked around in case he somehow got in without signing in, but I haven't found him. I guess it's time to work with Erin.

On Wed, Oct 7, 2015 at 2:10 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:
Please go ahead and try to get him to chat about this and reconsider. We can adjust his time, pay for flight, apologize again. Let me know if you get a chance to talk to him.

At this point unless you hear differently we are going to move forward later today to work with Erin. JB

Jodi L. Bush
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--

Martin Miller, Chief, Division of Endangered Species, Northeast Region, U.S. Fish and Wildlife Service, 300 Westgate Center Drive, Hadley, MA 01035, 413-253-8615

From: [McCollough, Mark](#)
To: [Miller, Martin](#)
Subject: Re: I called Dan yesterday and LM but no response
Date: Wednesday, October 07, 2015 4:19:32 PM

Marty:

Dan may be visiting tomorrow (Thursday), but I don't know for sure. Mitch H. would probably know. We are working on plan B. Mark

On Wed, Oct 7, 2015 at 2:53 PM, Miller, Martin <martin_miller@fws.gov> wrote:
He never signed in to the building today. I looked around in case he somehow got in without signing in, but I haven't found him. I guess it's time to work with Erin.

On Wed, Oct 7, 2015 at 2:10 PM, Bush, Jodi <jodi_bush@fws.gov> wrote:
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At this point unless you hear differently we are going to move forward later today to work with Erin. JB

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Cell Phone: 207 944-5709
mark_mccollough@fws.gov

From: [McCollough, Mark](#)
To: [Zelenak, Jim](#)
Subject: Re: Mark will talk to Erin tomorrow morning
Date: Wednesday, October 07, 2015 5:44:25 PM

Thanks Jim. Erin and I agree that forest management (and associated regulations) are the greatest challenge to lynx recovery in Maine. Erin will do a good job covering this topic and will cover her research with climate change, budworm, and spruce-fir in the Acadian region.

We will work together to have what information we can on hare, cycles/fluctuations, especially as it relates to forest management.

Thanks for all the last-minute adjustments.

Mark

On Wed, Oct 7, 2015 at 5:30 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

We had a good call, and she has agreed to take Dan's place on the expert panel and to provide a presentation in the "Overview Presentations" section on Wed. morning after the climate change presentations. The title of her presentation will be "Forest Management and Lynx Habitat Trends." The status and threats update for the Maine/Northeast population will be done by Jennifer Vashon, who I will notify via email that she will now have that slot to herself (so time for a 20-minute presentation and 10 minutes of questions/discussion).

Not sure what we would do now if Dan *did* change his mind....

On Wed, Oct 7, 2015 at 2:39 PM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Jim: I just talked briefly with Erin who said that you had just talked to her. Thanks!

She and I will talk more tomorrow morning, and I will help her as much as I can with preparation from here.

From what Erin said, she thinks Dan is in route to our regional office today. I think his meetings there are tomorrow. I let Marty know. However, Erin and I did not have much hope that would change the outcome.

Mark

--

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mark_mccollough@fws.gov

From: [McCollough, Mark](#)
To: [Zelenak, Jim](#); [Mary Parkin](#)
Subject: Re: unpublished data next week
Date: Wednesday, October 07, 2015 5:50:58 PM

Can we take notes summarizing presentations, but not necessarily require that presenters provide us with their power point presentations to include in the administrative record? This would be similar to scientific conferences where abstracts of the talks are retained as a record, and the unpublished data are used in peer-reviewed papers that are developed later.

I suspect that presenters will want to show and interpret unpublished data, but not necessarily leave a copy of the powerpoint for the Service's administrative record.

I suppose if there were certain key maps, figures, tables, etc. that we could ask the presenters if they were comfortable leaving us with a copy.

Mark

On Wed, Oct 7, 2015 at 5:39 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

I agree. As we discussed on the modeling call today, we should likely remind presenters to think carefully about if/how they may use unpublished data in their presentations, as they will become part of the administrative record, and that we would not be able to withhold them if FOIAed.

On Tue, Oct 6, 2015 at 5:21 PM, Parkin, Mary <mary_parkin@fws.gov> wrote:

This is a valid concern, Mark. Thanks for bringing it to light, and if not earlier, we can discuss on Monday.

Mary

On Tue, Oct 6, 2015 at 7:00 PM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Jim and Mary: Erin asked me if unpublished data would be retained in power points or otherwise shared. I expect this will be a concern of the other experts who will present unpublished data.

Perhaps this topic should be addressed at the opening of the session next week.

I will be in Minneapolis by mid-day on Monday, and am more than willing to help prepare, discuss, etc. in preparation for the next day.

Mark

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mark_mccollough@fws.gov

From: [Nichole Cudworth](#)
To: [Zelenak, Jim](#)
Subject: Re: Name for workshop
Date: Thursday, October 08, 2015 10:34:42 AM

Hi Jim,

That was me on the call last week. I'm currently in that confusing stage, even for me, of a name change. I got married a month ago and am still working on getting everything switched over. Please use Nichole Bjornlie on my name tag. I've sent a request to our IT folks to get my e-mail address changed to reflect my married name, so hopefully that will be taken care of soon and be less confusing.

Thanks for checking,
Nichole

On Thu, Oct 8, 2015 at 10:26 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi Nichole,

We're making folders and name tags/tents for the lynx workshop, and I wasn't sure if you've had a recent name change (or if a different Nichole was on the coordination call last week).

Please let me know how you'd like your name to appear on these items.

Thanks,

--

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 [\(406\) 449-5225 ext. 220](tel:(406)449-5225)
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--

Nichole (Cudworth) Bjornlie
Nongame Mammal Biologist
Wyoming Game and Fish Department
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W 307.332.7723 ext. 230
F 307.332.6669

E-Mail to and from me, in connection with the transaction of public business, is subject to the Wyoming Public Records Act and may be disclosed to third parties.

From: [Zelenak, Jim](#)
To: [Barbara Chavez](#)
Subject: Fwd: Info for lynx workshop name tents
Date: Thursday, October 08, 2015 10:41:19 AM

For Nichole, also add "Department" after "Wyoming Game and Fish"

Thanks

----- Forwarded message -----

From: **Zelenak, Jim** <jim_zelenak@fws.gov>
Date: Thu, Oct 8, 2015 at 10:39 AM
Subject: Re: Info for lynx workshop name tents
To: Barbara Chavez <barbara_chavez@fws.gov>
Cc: Jodi Bush <jodi_bush@fws.gov>

Barb,

Please change Nichole Cudworth to Nichole Bjornlie - she just got married and replied with her new name.

thanks,

jim

On Thu, Oct 8, 2015 at 10:36 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Attached names and affiliations, also photo

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
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jim_zelenak@fws.gov

From: [Bush, Jodi](#)
To: [Bell, Heather](#)
Cc: [Zelenak, Jim](#); [Cummings, Jonathan](#); [Mary Parkin](#)
Subject: Re: Remaining preparation
Date: Thursday, October 08, 2015 10:45:34 AM

I agree. They are captive AND some of them are already leaving early-ish on Thursday. JB

Jodi L. Bush
Field Supervisor
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On Thu, Oct 8, 2015 at 10:35 AM, Bell, Heather <heather_bell@fws.gov> wrote:

Yes go longer. they won't mind. :-)

Heather Bell
Ecological Services HQ
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SSA Framework Team Lead
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134 S. Union Blvd
Lakewood, CO 80228
303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google
Site: <https://sites.google.com/a/fws.gov/rev/>

On Thu, Oct 8, 2015 at 9:34 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Thanks Jonathan,

I will take a look at each of those today and focus on the questions. Now that we have decided that we will not send out the conceptual models to experts/participants, my plan was to move on (after some other logistics/details here this morning - like still trying to get a printer in the room....) to a handful of overarching questions that we could send as examples to the expert panel (and maybe other experts but not observers) along with the ground rules document. I'd like to get both those to experts today. I'll look at the questions you drafted before drafting mine.

I also have been revising the agenda based on the Maine issues and confirmation yesterday that the U. Washington Climate lab (Lawler and Wilsey) will provide a remote (webex) presentation on their climate/lynx modeling work as part of the climate change presentation on Wed. morning. I'll upload my revised agenda and perhaps you and I can work there to get ours in alignment? I'll also upload the questions/examples for your review (Heather's and Mary's, too if they can) before sending them out to experts.

I'm worried that it will be hard to get the presenters to hold to the schedule, so we may need to be pretty firm. Even so, the agenda is getting pretty full and, although I have little idea how the elicitation process will work or how much time is needed, I wonder if we should plan on going longer each afternoon so that we can get everything done we need to and not miss opportunities to get the most out of this rare assemblage of experts.

Jim

On Wed, Oct 7, 2015 at 11:07 PM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:

Thanks for answering my questions along the way as we prepare and helping get me up to speed. If it were next Tuesday at 1pm I think we could make something useful happen from a facilitation perspective at this point, but upon reflection today I developed more opportunities for preparation feedback that we could address to make it easier. Sorry for not addressing them on the call today, sometimes I need to processing time, and we seemed pretty conceptual model focused.

I know you're all busy this week, so if these are all things that don't get addressed until we are in MN, or on the fly that's how it goes. Knowing the roles will help us adapt on the fly if needed. The main item to think more about is the elicitation questions. I tried to put together the set of questions we might actually ask, but there is definitely room for improvement.

I've created three items in a "Workshop Materials" folder on the google drive:

1. Core Team EE Agenda
2. Meeting Roles
3. Elicitation Questions

1. Core Team EE Agenda - I tried to flesh out some of the items for myself to know what to say or what the goal is for my agenda items.
2. Meeting Roles - We've addressed some of who will be doing what, but there might be room for further evaluation. With that in mind I listed the roles individuals can fill based on my knowledge (sorry if I characterize anyone incorrectly). I'm not assigning anyone to anything, just attempting to understand, so reassign yourself to the skills that you'll best fulfill.
3. Elicitation Questions - I tried to draft the set of questions we would ask of the experts. Knowing what we are asking would help to prepare mental modeler files and excel spreadsheet files for the workshop. The questions likely need revision depending on both service input about both what gets asked and what output is desired to produce the SSA needed for subsequent decision making as well SSA FIT facilitation input about how we ask the questions.

I really should work on lesser prairie chicken the rest of this week, but I'll feel better the more we prepare so if you have questions or want to revise anything together let me know.

Cheers,
Jonathan

P.S. Sorry for any writing errors, my email proofreading skills aren't great normally, and working late makes it worse

--

Jonathan W. Cummings, PhD
Research Ecologist

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(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Bell, Heather](#)
To: [Cummings, Jonathan](#)
Cc: [Mary Parkin](#); [Jim Zelenak](#)
Subject: Re: Remaining preparation
Date: Thursday, October 08, 2015 10:56:32 AM

Oh you just moved us LIGHT YEARS AHEAD in our planning!!!! thank you.
I have provided some comments in the google drive, and then was just looking through my scratchy notes from yesterday to see what might not have gotten captured. I am not saying these are important to capture though, so no reason to automatically add them - no particular order

1. how do you track abundance, subadults separated out?
2. is abundance alone the only measure, what about occupancy over time (presence of resident breeding population), is that better given low hare years?
3. assume it is the low cycle hare years within the US that we care about.
4. what is the relative contribution to the demographic stability of the dps from resident productivity/recruitment versus intermittent immigration from Canada. by dps does it differ?
5. sounds like keeping hares in places where other species can't outcompete Lynx is important. how do we consider this when we are doing our future scenario predictions. would we base this on some kind of snow quality?
6. What genetic conservation considerations should we keep in mind given the probable future scenarios?

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
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303-236-4514

Check it out! SSA Framework - Google Site for Staff
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Jonathan

P.S. Sorry for any writing errors, my email proofreading skills aren't great normally, and working late makes it worse

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<https://profile.usgs.gov/jwcummings>

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Dover, NH 03820

From: [Bush, Jodi](#)
To: [Zelenak, Jim](#)
Subject: Re: NPS representative at lynx workshop
Date: Thursday, October 08, 2015 11:49:11 AM

no. nothing and I've asked...JB

Jodi L. Bush
Field Supervisor
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(406) 449-5225, ext.205

On Thu, Oct 8, 2015 at 11:36 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Do you have Bill Rowdy's contact info (email address and phone no.)?

--

Jim Zelenak, Biologist
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jim_zelenak@fws.gov

From: [Vashon, Jennifer](#)
To: [Zelenak, Jim](#)
Subject: RE: Lynx Workshop Update
Date: Friday, October 09, 2015 6:49:07 AM

Hi Jim

Thanks for updating me on the changes to the agenda. I appreciate having a bit more time. I look forward to meeting you too. Have a safe trip.

Jen

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Thursday, October 08, 2015 5:41 PM
To: Vashon, Jennifer
Subject: Lynx Workshop Update

Hi Jennifer,

We revised the workshop agenda, and you now have a half-hour slot (20 minutes for your presentation, 10 minutes for questions/discussion) on Wednesday morning to provide the update on the best available science regarding the status of, threats to, and considerations for the future viability of the lynx population in Maine/the Northeast.

Let me know if you have questions.

I'm looking forward to meeting you next week and hearing your presentation.

--

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From: Monette, DJ
To: [Laury Zicari](#); [Mark McCollough](#)
Cc: [Paul Phifer](#); [Martin Miller](#); [Kyla Hastie](#); [Christine Eustis](#)
Subject: Fwd: Tribal Participation in Cananda Lynx Expert Elicitation Workshop, October 13-15, 2015, being held in Minneapolis, Minnesota
Date: Friday, October 09, 2015 7:13:24 AM

Hi Laury / Mark,

FYI - see below. I know we have been trying to reach each other but have not connected. I assume this was one of the topics of discussion you had in mind?

Thanks,

DJ

----- Forwarded message -----

From: **Zelenak, Jim** <jim_zelenak@fws.gov>
Date: Fri, Oct 2, 2015 at 3:11 PM
Subject: Re: Tribal Participation in Cananda Lynx Expert Elicitation Workshop, October 13-15, 2015, being held in Minneapolis, Minnesota
To: "Monette, DJ" <dj_monette@fws.gov>

Thanks DJ. We have had no other calls or emails yet.

John has the first slot if he wants it, and I checked with Jodi and she said we can help cover travel costs if he requests/needs it.

If we get a second response, and confirm to attendees, I'll let you know and maybe you all would send out a follow-up that the slots are filled?

Anyway - there doesn't yet seem to be a mad dash to attend.

Jim

On Fri, Oct 2, 2015 at 11:26 AM, Monette, DJ <dj_monette@fws.gov> wrote:

FYI - see below. Here's an interest from the Passamaquoddy Tribe.

Thanks,

DJ

----- Forwarded message -----

From: **JOHN SEWELL** <johnsewell44@hotmail.com>
Date: Fri, Oct 2, 2015 at 1:25 PM
Subject: Re: Tribal Participation in Cananda Lynx Expert Elicitation Workshop, October 13-15, 2015, being held in Minneapolis, Minnesota
To: "Monette, DJ" <dj_monette@fws.gov>

I'm very interested in this. I know that travel and availability will be difficult for me to attend but I would like the information from this. Thanks.

Sent from my iPhone

On Oct 2, 2015, at 1:00 PM, Monette, DJ <dj_monette@fws.gov> wrote:

Hello Folks,

The U.S. Fish and Wildlife Service (Service) is conducting a Species Status Assessment (SSA; see attached fact sheet) for the contiguous U.S. distinct population segment (DPS) of the Canada lynx, which is listed as threatened under the Endangered Species Act (ESA). The SSA is intended to provide the biological and scientific underpinnings for all decisions the Service must make in accordance with the ESA, including future recovery planning for the lynx DPS.

The Service jointly respects and values the significant role of Indian Tribes in past and ongoing lynx conservation. We also respect the sovereignty of Tribal governments and our collective Trust responsibility to Tribes. Continuing this effective relationship with interested Tribes and others is essential to achieving recovery of lynx. Therefore, once the lynx SSA is completed, the Service expects to work very closely with those Tribes who wish to participate in the development of Draft and Final Recovery Plans for lynx, and expect to coordinate and/or consult with Tribes throughout this process. This approach demonstrates our commitment to working directly with Tribes to gain significant input, and address Tribal interests and concerns prior to completing a Final Recovery Plan for lynx.

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Due to the limited opportunities for participation at this meeting, we will gladly make the materials and presentations from the meeting available upon request. As the SSA progresses, we'll continue to keep Tribes updated.

Again, please be sure to contact Jim Zelenak as soon as you can if you are interested in participating.

Thanks,

DJ

--

DJ Monette

U.S. Fish and Wildlife Service

Acting Deputy National Native American Programs
Coordinator /

Northeast Region Native American Liaison

300 Westgate Center Drive

Hadley, MA 01035

Office: (413) 253-8662

Cell: (413) 244-4495

Fax: (413) 253-8456

dj_monette@fws.gov

<ssa fact sheet_draft September 2015 for use in Lynx meeting.pdf>

<Attachment 2 - Hotel Information for Lynx SSA Expert Elicitation
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--

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dj_monette@fws.gov

From: [Ivy Allen](#)
To: [Jim Zelenak](#)
Subject: RE: Tribal Participation in Cananda Lynx Expert Elicitation Workshop, October 13-15, 2015, being held in Minneapolis, Minnesota
Date: Friday, October 09, 2015 7:51:53 AM

Hi Jim, I have not had any responses back.

Ivy Allen | Tribal Communication Specialist | U.S. Fish and Wildlife Service | Mountain-Prairie Region | 134 Union Blvd., Lakewood, CO 80228 | Ivy.Allen@fws.gov | 303-236-4575

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Thursday, October 08, 2015 11:35 AM
To: Monette, DJ; Jodi Bush
Cc: Ivy Allen; Charles Traxler; Garrett Peterson; Nathan Dexter; Joe Early
Subject: Re: Tribal Participation in Cananda Lynx Expert Elicitation Workshop, October 13-15, 2015, being held in Minneapolis, Minnesota

Hi All:

Other than an expression of interest from a member of the Passamaquoddy Tribe in receiving the products from the workshop, I have not yet had any other expressions of interest or desire to attend the workshop from any other Tribal members/representatives.

We are finalizing the participant list for the workshop, so please let me know if you have had any responses that I have not received. We need to finalize the list and produce workshop folders, etc. by tomorrow. We travel on Monday and the workshop begins on Tues. next week.

Thanks,

Jim

On Fri, Oct 2, 2015 at 11:01 AM, Monette, DJ <dj_monette@fws.gov> wrote:
FYI - see below.

----- Forwarded message -----

From: **Monette, DJ** <dj_monette@fws.gov>
Date: Fri, Oct 2, 2015 at 1:00 PM
Subject: Tribal Participation in Cananda Lynx Expert Elicitation Workshop, October 13-15, 2015, being held in Minneapolis, Minnesota
To: John Banks <john.banks@penobscotnation.org>, John Sewell <johnsewell44@hotmail.com>, Fred Corey <fcorey@micmac-nsn.gov>, Sharri Venno <envplanner@maliseets.com>, Sue Young <ogs1@maliseets.com>, Marvin Cling <marvin@wabanaki.com>, Kristin Peet <kristin.peet@penobscotnation.org>

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Again, please be sure to contact Jim Zelenak as soon as you can if you are interested in participating.

Thanks,

DJ

--

DJ Monette

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U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225 ext. 220

jim_zelenak@fws.gov

From: [Monette, DJ](#)
To: [Laury Zicari](#); [Mark McCollough](#)
Cc: [Paul Phifer](#); [Martin Miller](#); [Kyla Hastie](#); [Christine Eustis](#)
Subject: Fwd: Tribal Participation in Cananda Lynx Expert Elicitation Workshop, October 13-15, 2015, being held in Minneapolis, Minnesota
Date: Friday, October 09, 2015 9:13:20 AM

Hi Laury / Mark,

FYI - see below. I know we have been trying to reach each other but have not connected. I assume this was one of the topics of discussion you had in mind?

Thanks,

DJ

----- Forwarded message -----

From: **Zelenak, Jim** <jim_zelenak@fws.gov>
Date: Fri, Oct 2, 2015 at 3:11 PM
Subject: Re: Tribal Participation in Cananda Lynx Expert Elicitation Workshop, October 13-15, 2015, being held in Minneapolis, Minnesota
To: "Monette, DJ" <dj_monette@fws.gov>

Thanks DJ. We have had no other calls or emails yet.

John has the first slot if he wants it, and I checked with Jodi and she said we can help cover travel costs if he requests/needs it.

If we get a second response, and confirm to attendees, I'll let you know and maybe you all would send out a follow-up that the slots are filled?

Anyway - there doesn't yet seem to be a mad dash to attend.

Jim

On Fri, Oct 2, 2015 at 11:26 AM, Monette, DJ <dj_monette@fws.gov> wrote:

FYI - see below. Here's an interest from the Passamaquoddy Tribe.

Thanks,

DJ

----- Forwarded message -----

From: **JOHN SEWELL** <johnsewell44@hotmail.com>
Date: Fri, Oct 2, 2015 at 1:25 PM
Subject: Re: Tribal Participation in Cananda Lynx Expert Elicitation Workshop, October 13-15, 2015, being held in Minneapolis, Minnesota
To: "Monette, DJ" <dj_monette@fws.gov>

I'm very interested in this. I know that travel and availability will be difficult for me to attend but I would like the information from this. Thanks.

Sent from my iPhone

On Oct 2, 2015, at 1:00 PM, Monette, DJ <dj_monette@fws.gov> wrote:

Hello Folks,

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Due to the limited opportunities for participation at this meeting, we will gladly make the materials and presentations from the meeting available upon request. As the SSA progresses, we'll continue to keep Tribes updated.

Again, please be sure to contact Jim Zelenak as soon as you can if you are interested in participating.

Thanks,

DJ

--

DJ Monette

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<ssa fact sheet_draft September 2015 for use in Lynx meeting.pdf>

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dj_monette@fws.gov

From: [Smith, Tamara](#)
To: [FW3 FO ES Twin Cities FO](#)
Subject: HP Office Jet 8600
Date: Friday, October 09, 2015 2:27:14 PM

Hi All,

Apologies in advance! I am borrowing the HP Office Jet 8600 this week for the lynx expert elicitation workshop. I'll be bringing it back on Friday 10/16.

Thanks,
Tam

--

Tamara Smith
U.S. Fish and Wildlife Service
Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425
612-725-3548 ext. 2219
612-600-1599 cell

From: [Zelenak, Jim](#)
To: [Cummings, Jonathan](#)
Cc: [Mary Parkin](#); [Heather Bell](#); [Jodi Bush](#); [Seth Willey](#); [Kurt Broderdorp](#); [Mark McCollough](#); [Tamara Smith](#)
Subject: Re: Revised Agenda and participant list, etc.
Date: Friday, October 09, 2015 2:53:32 PM

Thanks Jonathon - we are including the latest versions of the 4 conceptual models and over-nighting the folders to the hotel. We can revisit there if needed.

I got locked out of the elicitation questions on the drive and then caught up in other stuff - we will need to visit about those, too. Good progress though, and I agree that we are getting close.

On Fri, Oct 9, 2015 at 2:31 PM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:

I say yes to including the conceptual models.

On Thu, Oct 8, 2015 at 4:30 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Revised Agenda - Attached with changes needed to address Maine issues and to reflect the presentation by Simons-Legaard and the remote presentation by Lawler and Wilsey (U Washington Climate modelers). This meant eating into the Day 2 afternoon session a little, so I added time at the end of the day.

Also attached are the revised participant list and team member cell phone numbers

I've also uploaded these to the share drive in the Workshop Materials folder (dated 2015 10 08).

We are putting together participant folders here to give to participants at the start of the workshop. So far, these include:

SSA Fact Sheet

3 Rs

Expert Meetings White Paper

I also intend to put the Ground Rules and participant list/contact info in there.

I'd like Jonathan's, Heather's, and Mary's thoughts on whether we should also put prints of the 4 conceptual models in the folder (they will get folders at 1 PM and we will introduce and project them later in the afternoon) - this way they would have hard copies to take along after the session on Day 1 if they wanted to study them in more detail. Jodi and I have discussed this and think it may be useful to include them.

I'd also like any thoughts from the rest of the group on other materials that would be good to include as hard copies in the participant folders.

Thanks,

Jim

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(406) 449-5225 ext. 220
jim_zelenak@fws.gov

--

Jonathan W. Cummings, PhD
Research Ecologist
USGS - Patuxent Wildlife Research Center (remotely located)
12100 Beech Forest Road
Laurel, MD 20708 USA
jwcummings@usgs.gov
<https://profile.usgs.gov/jwcummings>

Remote Contact Info:

Ph: 802-999-8684
243 Locust St
Dover, NH 03820

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From: [Alexej Siren](#)
To: ["Zelenak, Jim"](#)
Subject: RE: Lynx SSA Workshop Ground Rules
Date: Friday, October 09, 2015 3:18:59 PM

Hello Jim,

Thanks for sending this along. I look forward to meeting you soon and participating in this process.

Have a nice weekend!

Alexej

Alexej Sirén, MSc.
PhD Fellow
DOI Northeast Climate Science Center
Department of Environmental Conservation
University of Massachusetts Amherst
asiren@umass.edu

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Friday, October 09, 2015 5:14 PM
To: McKelvey, Kevin -FS <kmckelvey@fs.fed.us>; Vashon, Jennifer <jennifer.vashon@maine.gov>; Ron Moen <rmoen@d.umn.edu>; Catton, Susan J -FS <scatton@fs.fed.us>; Squires, John -FS <jsquires@fs.fed.us>; Jay Kolbe <jkolbe.fwp@gmail.com>; Maletzke, Benjamin T (DFW) <Benjamin.Maletzke@dfw.wa.gov>; Jake Ivan - DNR <Jake.ivan@state.co.us>; Bowman, Jeff (MNRF) <jeff.bowman@ontario.ca>; Jackson, Scott -FS <sjackson03@fs.fed.us>; Schwartz, Michael K -FS <michaelkschwartz@fs.fed.us>; Hodges, Karen <karen.hodges@ubc.ca>; Josh Lawler <jlawler@uw.edu>; freli001@umn.edu; Alexej Siren <asiren@umass.edu>; Erin Simons-Legaard <erin.simons@maine.edu>; Wilsey, Chad <cwilsey@audubon.org>; Baker, Richard (DNR) <richard.baker@state.mn.us>; Nichole Cudworth <nichole.cudworth@wyo.gov>; NathanM.Roberts@wisconsin.gov
Cc: Jodi Bush <jodi_bush@fws.gov>; Mary Parkin <mary_parkin@fws.gov>; Heather Bell <heather_bell@fws.gov>; Jonathan Cummings <jwcummings@usgs.gov>; Seth Willey <seth_willey@fws.gov>; Justin Shoemaker <justin_shoemaker@fws.gov>; Kurt Broderdorp <kurt_broderdorp@fws.gov>; Bryon Holt <bryon_holt@fws.gov>; Mark McCollough <mark_mccollough@fws.gov>; Tamara Smith <tamara_smith@fws.gov>
Subject: Lynx SSA Workshop Ground Rules

Hi All:

Attached is a document it would be helpful for you to look over before the workshop next week.

I look forward to seeing you all there and to a productive couple of days of lynx discussions.

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jim_zelenak@fws.gov

From: [Bell, Heather](#)
To: [Zelenak, Jim](#)
Subject: Re: Revised Agenda and participant list, etc.
Date: Monday, October 12, 2015 7:12:46 AM

i agree with Jonathon, add the hard copy conceptual models. we can put it in context first thing today.

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
Lakewood, CO 80228
303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>

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jim_zelenak@fws.gov

From: [Roberts, Nathan M - DNR](#)
To: [Zelenak, Jim](#)
Subject: RE: Lynx SSA Workshop - Reserve Rooms by Sept. 30
Date: Monday, October 12, 2015 10:44:40 AM

Hi Jim,
I am assuming the workshop is at the hotel?
Thanks,
-Nathan

Nathan M. Roberts, PhD
Bear, Wolf, and Furbearer Research Scientist
Wisconsin Department of Natural Resources
107 Sutliff Ave.
Rhineland, WI 54501

NathanM.Roberts@wisconsin.gov
715.490.9345

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Tuesday, September 29, 2015 3:51 PM
To: Vashon, Jennifer; Ron Moen; Catton, Susan J -FS; Squires, John -FS; Jay Kolbe; Jake Ivan - DNR; Bowman, Jeff (MNRF); Jackson, Scott -FS; Schwartz, Michael K -FS; Erin Simons-Legaard; Hodges, Karen; Baker, Richard (DNR); Nichole Cudworth; asiren@umass.edu; Roberts, Nathan M - DNR; Benjamin.Maletzke@dfw.wa.gov; McKelvey, Kevin -FS; Dan Harrison
Cc: Kurt Broderdorp; Bryon Holt; Tamara Smith; Mark McCollough; Mary Parkin; Heather Bell; Jonathan Cummings; Seth Willey; Justin Shoemaker; Kaimy Marks; Jodi Bush
Subject: Lynx SSA Workshop - Reserve Rooms by Sept. 30

Hi All:

If you will be attending the Minneapolis workshop, need a hotel room, and haven't reserved it yet, please do so today or tomorrow. After Sept. 30, the Hotel will release the blocked rooms for general occupancy and we cannot guarantee the government rate.

Please see the attached hotel information and contact Kaimy Marks if you have questions about lodging or airfare.

Look forward to seeing you all in a few weeks.

Jim

--

Jim Zelenak, Biologist
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Montana Ecological Services Office
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Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Alexej Siren](#)
Subject: Re: Lynx SSA Workshop Ground Rules
Date: Monday, October 12, 2015 4:42:11 PM

We now have a one-hour agenda slot at 8 AM Wed. morning for 3 20-minute climate-focused talks: Lee Frelich, then you, then Josh Lawler and Chad Wilsey via webex.

Does that work? We will probably ask that folks wait for questions until the end of the hour.

On Sun, Oct 11, 2015 at 1:09 PM, Alexej Siren <asiren@umass.edu> wrote:

Hello Jim,

I noticed on the draft agenda that you have 45 min designated for the climate change presentations. Are you thinking that Lee, Josh, and I will split that time evenly for presentations or it will be more of a roundtable forum? Just curious as I am working on my slideshow and wondering if I need to shorten it a bit.

Thanks,

Alexej

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]

Sent: Friday, October 09, 2015 5:14 PM

To: McKelvey, Kevin -FS <kmckelvey@fs.fed.us>; Vashon, Jennifer <jennifer.vashon@maine.gov>; Ron Moen <rmoen@d.umn.edu>; Catton, Susan J -FS <scatton@fs.fed.us>; Squires, John -FS <jsquires@fs.fed.us>; Jay Kolbe <jkolbe.fwp@gmail.com>; Maletzke, Benjamin T (DFW) <Benjamin.Maletzke@dfw.wa.gov>; Jake Ivan - DNR <Jake.ivan@state.co.us>; Bowman, Jeff (MNRF) <jeff.bowman@ontario.ca>; Jackson, Scott -FS <sjackson03@fs.fed.us>; Schwartz, Michael K -FS <michaelkschwartz@fs.fed.us>; Hodges, Karen <karen.hodges@ubc.ca>; Josh Lawler <jlawler@uw.edu>; freli001@umn.edu; Alexej Siren <asiren@umass.edu>; Erin Simons-Legaard <erin.simons@maine.edu>; Wilsey, Chad <cwilsey@audubon.org>; Baker, Richard (DNR) <richard.baker@state.mn.us>; Nichole Cudworth <nichole.cudworth@wyo.gov>; NathanM.Roberts@wisconsin.gov

Cc: Jodi Bush <jodi_bush@fws.gov>; Mary Parkin <mary_parkin@fws.gov>; Heather Bell <heather_bell@fws.gov>; Jonathan Cummings <jwcummings@usgs.gov>; Seth Willey <seth_willey@fws.gov>; Justin Shoemaker <justin_shoemaker@fws.gov>; Kurt Broderdorp <kurt_broderdorp@fws.gov>; Bryon Holt <bryon_holt@fws.gov>; Mark McCollough <mark_mccollough@fws.gov>; Tamara Smith <tamara_smith@fws.gov>

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Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

--

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jim_zelenak@fws.gov

From: [Alexej Siren](#)
To: [Zelenak, Jim](#)
Subject: Re: Lynx SSA Workshop Ground Rules
Date: Monday, October 12, 2015 4:43:38 PM

Hello Jim,

That works fine. Thanks for getting back to me on that detail.

Alexej

Sent from my iPhone

On Oct 12, 2015, at 5:42 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

We now have a one-hour agenda slot at 8 AM Wed. morning for 3 20-minute climate-focused talks: Lee Frelich, then you, then Josh Lawler and Chad Wilsey via webex.

Does that work? We will probably ask that folks wait for questions until the end of the hour.

On Sun, Oct 11, 2015 at 1:09 PM, Alexej Siren <asiren@umass.edu> wrote:

Hello Jim,

I noticed on the draft agenda that you have 45 min designated for the climate change presentations. Are you thinking that Lee, Josh, and I will split that time evenly for presentations or it will be more of a roundtable forum? Just curious as I am working on my slideshow and wondering if I need to shorten it a bit.

Thanks,

Alexej

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]

Sent: Friday, October 09, 2015 5:14 PM

To: McKelvey, Kevin -FS <kmckelvey@fs.fed.us>; Vashon, Jennifer <jennifer.vashon@maine.gov>; Ron Moen <rmoen@d.umn.edu>; Catton, Susan J -FS <scatton@fs.fed.us>; Squires, John -FS <jsquires@fs.fed.us>; Jay Kolbe <jkolbe.fwp@gmail.com>; Maletzke, Benjamin T (DFW) <Benjamin.Maletzke@dfw.wa.gov>; Jake Ivan - DNR <Jake.ivan@state.co.us>;

Bowman, Jeff (MNRF) <jeff.bowman@ontario.ca>; Jackson, Scott -FS <sjackson03@fs.fed.us>; Schwartz, Michael K -FS <michaelkschwartz@fs.fed.us>; Hodges, Karen <karen.hodges@ubc.ca>; Josh Lawler <jlawler@uw.edu>; frel001@umn.edu; Alexej Siren <asiren@umass.edu>; Erin Simons-Legaard <erin.simons@maine.edu>; Wilsey, Chad <cwilsey@audubon.org>; Baker, Richard (DNR) <richard.baker@state.mn.us>; Nichole Cudworth <nichole.cudworth@wyo.gov>; NathanM.Roberts@wisconsin.gov
Cc: Jodi Bush <jodi_bush@fws.gov>; Mary Parkin <mary_parkin@fws.gov>; Heather Bell <heather_bell@fws.gov>; Jonathan Cummings <jwcummings@usgs.gov>; Seth Willey <seth_willey@fws.gov>; Justin Shoemaker <justin_shoemaker@fws.gov>; Kurt Broderdorp <kurt_broderdorp@fws.gov>; Bryon Holt <bryon_holt@fws.gov>; Mark McCollough <mark_mccollough@fws.gov>; Tamara Smith <tamara_smith@fws.gov>
Subject: Lynx SSA Workshop Ground Rules

Hi All:

Attached is a document it would be helpful for you to look over before the workshop next week.

I look forward to seeing you all there and to a productive couple of days of lynx discussions.

--

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From: [Zelenak, Jim](#)
To: [Roberts, Nathan M - DNR](#)
Subject: Re: Lynx SSA Workshop - Reserve Rooms by Sept. 30
Date: Monday, October 12, 2015 4:44:44 PM

Yes, 2nd floor, Empire conference room. Signs are on two doors.

On Mon, Oct 12, 2015 at 12:44 PM, Roberts, Nathan M - DNR
<NathanM.Roberts@wisconsin.gov> wrote:

Hi Jim,

I am assuming the workshop is at the hotel?

Thanks,

-Nathan

Nathan M. Roberts, PhD

Bear, Wolf, and Furbearer Research Scientist

Wisconsin Department of Natural Resources

107 Sutliff Ave.

Rhinelander, WI 54501

NathanM.Roberts@wisconsin.gov

715.490.9345

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]

Sent: Tuesday, September 29, 2015 3:51 PM

To: Vashon, Jennifer; Ron Moen; Catton, Susan J -FS; Squires, John -FS; Jay Kolbe; Jake Ivan - DNR; Bowman, Jeff (MNRF); Jackson, Scott -FS; Schwartz, Michael K -FS; Erin Simons-Legaard; Hodges, Karen; Baker, Richard (DNR); Nichole Cudworth; asiren@umass.edu; Roberts, Nathan M - DNR; Benjamin.Maletzke@dfw.wa.gov; McKelvey, Kevin -FS; Dan Harrison

Cc: Kurt Broderdorp; Bryon Holt; Tamara Smith; Mark McCollough; Mary Parkin; Heather Bell; Jonathan Cummings; Seth Willey; Justin Shoemaker; Kaimy Marks; Jodi Bush

Subject: Lynx SSA Workshop - Reserve Rooms by Sept. 30

Hi All:

If you will be attending the Minneapolis workshop, need a hotel room, and haven't reserved it yet, please do so today or tomorrow. After Sept. 30, the Hotel will release the blocked rooms for general occupancy and we cannot guarantee the government rate.

Please see the attached hotel information and contact Kaimy Marks if you have questions about lodging or airfare.

Look forward to seeing you all in a few weeks.

Jim

--

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--

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jim_zelenak@fws.gov

From: [Wilsey, Chad](#)
To: [Zelenak, Jim](#); [Josh Lawler](#)
Cc: [Tamara Smith](#); [Mark McCollough](#)
Subject: RE: Invitation for Instant Net Conference
Date: Monday, October 12, 2015 5:33:32 PM

I will have something together by this evening and will send to Josh to collate with his content before sending off to you.

Chad

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Monday, October 12, 2015 4:32 PM
To: Josh Lawler <jlawler@uw.edu>; Wilsey, Chad <cwilsey@audubon.org>
Cc: Tamara Smith <tamara_smith@fws.gov>; Mark McCollough <mark_mccollough@fws.gov>
Subject: Re: Invitation for Instant Net Conference

Also - as a back up, please email your slides/presentation to me, Tamara, and Mark. That way we can still move forward with your talk, just changing slides on this end.

Thanks.

On Mon, Oct 12, 2015 at 7:27 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi Josh and Chad.

We are zeroing in on getting technical issues resolved, and the link below is to the webinar (my supervisor Brent's account). I put 8 AM, though your part of the presentation will be 8:40 - 9:00 central, and we will try to keep to that as best as we can here.

We are still working on the conference line and I will send that number to you tomorrow.

Keeping my fingers crossed that this is going to work.

Thanks,

Jim

----- Forwarded message -----

From: <e-meetings@mymeetings.com>
Date: Mon, Oct 12, 2015 at 7:17 PM
Subject: Invitation for Instant Net Conference
To: JIM_ZELENAK@fws.gov

You are invited to join a meeting hosted by BRENT ESMOIL. Meeting details are listed below.

Meeting Date: 10/14/2015

Meeting Time: 8:00 AM CENTRAL TIME

Instant Net Conference Details:

Meeting Number: 446939152

Meeting Passcode:

Meeting Host: BRENT ESMOIL

Join Instructions for Instant Net Conference:

1. Join the meeting now:

<http://www.mymeetings.com/nc/join.php?sigKey=mymeetings&i=446939152&p=&t=c>

2. Enter the required fields.

3. Indicate that you have read the Privacy Policy.

4. Click on Proceed.

--

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jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [McKelvey, Kevin -FS](#); [Vashon, Jennifer](#); [Ron Moen](#); [Catton, Susan J -FS](#); [Squires, John -FS](#); [Jay Kolbe](#); [Maletzke, Benjamin T \(DFW\)](#); [Jake Ivan - DNR](#); [Bowman, Jeff \(MNRF\)](#); [Jackson, Scott -FS](#); [Schwartz, Michael K -FS](#); [Hodges, Karen](#); [Josh Lawler](#); frei001@umn.edu; [Alexej Siren](#); [Erin Simons-Legaard](#); [Wilsey, Chad](#)
Subject: Re: Lynx SSA Workshop Ground Rules
Date: Monday, October 12, 2015 6:09:22 PM

Hi All:

I'm sure you all have already considered this, but I may have not done so. Please plan on arriving at or a little before 1 PM for the workshop, and those of you who will be presenting or have other data you may like to share, please bring your info on a thumb drive so that we can upload them to the computer that will be connected to the projector.

Thanks,

Jim

On Fri, Oct 9, 2015 at 5:14 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Hi All:

Attached is a document it would be helpful for you to look over before the workshop next week.

I look forward to seeing you all there and to a productive couple of days of lynx discussions.

--

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jim_zelenak@fws.gov

From: [Bush, Jodi](#)
To: [Paul Phifer](#)
Cc: [Martin Miller](#); [Spencer Simon](#)
Subject: Re: lynx and Maine
Date: Tuesday, October 13, 2015 10:00:13 AM

yes. although unfortunately we were unable to get Dan Harrison to reconsider. We had one of his students already attending. She will take his place on the panel. Check in with Martin or Mark for more specifics. Thanks. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

On Fri, Oct 9, 2015 at 3:26 PM, Paul Phifer <paul_phifer@fws.gov> wrote:

Jodi - I've been on travel. Has there been resolution on the Maine lynx attendance discussion? Thanks

Sent from my iPad

From: [McCollough, Mark](#)
To: [Laury Zicari](#)
Subject: Re: Eager to hear how today went
Date: Tuesday, October 13, 2015 6:40:28 PM

Hi Laury: We just wrapped up the first day of presentations. They were very good - lots of new information about genetic structure of the N. Am. population (and some interesting, unique attributes of lynx in eastern Canada and s. of the St. Lawrence, Nfld., and Cape Breton) and status in Canada immediately across the border. The state reports are tomorrow morning. Erin and Jen made it hear fine (compared to my 5 hours of delayed flights yesterday). The core team is working into the evenings to review the day's presentations and get ready for the "structured" part of the process. The experts seems a little overwhelmed by the "process" (as do the Core Team). They haven't been asking many questions after presentations.

After the presentations are done, it will be interesting to see if they open up to discuss the topics we want to hear their ideas on.

Mark

On Tue, Oct 13, 2015 at 4:31 PM, Laury Zicari <laury_zicari@fws.gov> wrote:

But tomorrow is when the state presentations begin?

Love to have been a fly on the wall. When do you return? Not til Monday?

Sent from my iPhone

--

Mark McCollough, Ph.D.
Endangered Species Specialist
Maine Field Office
U. S. Fish and Wildlife Service
17 Godfrey Drive, Suite 2
Orono, ME 04473
Phone 207 866-3344 x115
Cell Phone: 207 944-5709
mark_mccollough@fws.gov

From: Zicari, Laury
To: McCollough, Mark
Subject: Re: Eager to hear how today went
Date: Wednesday, October 14, 2015 6:26:10 AM

thanks for the update. ho boy. These new processes are something aren't they? I was exposed to just the tip of the iceberg working on the salmon recovery plan which is a "hybrid".

ho boy

On Tue, Oct 13, 2015 at 6:40 PM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Hi Laury: We just wrapped up the first day of presentations. They were very good - lots of new information about genetic structure of the N. Am. population (and some interesting, unique attributes of lynx in eastern Canada and s. of the St. Lawrence, Nfld., and Cape Breton) and status in Canada immediately across the border. The state reports are tomorrow morning. Erin and Jen made it hear fine (compared to my 5 hours of delayed flights yesterday). The core team is working into the evenings to review the day's presentations and get ready for the "structured" part of the process. The experts seems a little overwhelmed by the "process" (as do the Core Team). They haven't been asking many questions after presentations.

After the presentations are done, it will be interesting to see if they open up to discuss the topics we want to hear their ideas on.

Mark

On Tue, Oct 13, 2015 at 4:31 PM, Laury Zicari <laury_zicari@fws.gov> wrote:

But tomorrow is when the state presentations begin?

Love to have been a fly on the wall. When do you return? Not til Monday?

Sent from my iPhone

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Mark McCollough, Ph.D.
Endangered Species Specialist
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Phone 207 866-3344 x115
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--

Laury Zicari
Field Supervisor
Maine Field Office
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Orono, ME 04473
207-866-3344 x 1111
Fax 866-3351
Cell 207-949-0561

From: [Jonathan Cummings \(via Google Drive\)](#)
To: jodi_bush@fws.gov
Cc: tamara_smith@fws.gov; heather_bell@fws.gov; jim_zelenak@fws.gov; kurt_broderdorp@fws.gov; mary_parkin@fws.gov; mark_mccollough@fws.gov; justin_shoemaker@fws.gov; seth_willey@fws.gov
Subject: Lynx Demographics CM.mmp, Lynx Redundancy CM.mmp + 2 more items
Date: Wednesday, October 14, 2015 12:42:49 PM

jwcummings@usgs.gov has shared the following files:




-  [Lynx Demographics CM.mmp](#)
-  [Lynx Redundancy CM.mmp](#)
-  [Lynx Resiliency CM.mmp](#)
-  [Lynx Representation CM.mmp](#)

Google Drive: Have all your files within reach from any device.



From: [Jonathan Cummings \(via Google Drive\)](#)
To: jim_zelenak@fws.gov
Cc: tamara_smith@fws.gov; heather_bell@fws.gov; kurt_broderdorp@fws.gov; mary_parkin@fws.gov; mark_mccollough@fws.gov; justin_shoemaker@fws.gov; seth_willey@fws.gov; jodi_bush@fws.gov
Subject: Lynx Demographics CM.mmp, Lynx Redundancy CM.mmp + 2 more items
Date: Wednesday, October 14, 2015 12:43:01 PM

jwcummings@usgs.gov has shared the following files:

-  [Lynx Demographics CM.mmp](#)
-  [Lynx Redundancy CM.mmp](#)
-  [Lynx Resiliency CM.mmp](#)
-  [Lynx Representation CM.mmp](#)

Google Drive: Have all your files within reach from any device.



From: [Smith, Tamara](#)
To: [Peter Fasbender](#)
Subject: Re: Lynx workshop
Date: Wednesday, October 14, 2015 9:32:52 PM

I think I know! Do you know Jodi Bush? You can grab her and observe from the back. We will be way into the weeds in the elicitation process so I'm not sure how easy it will be to follow what is going on, but it is guaranteed to be interesting. We are on the 2nd floor by the business center.

On Wed, Oct 14, 2015 at 5:11 PM, Peter Fasbender <peter_fasbender@fws.gov> wrote:

You think...or you know? I may stop by tomorrow if I have time.

From: Smith, Tamara [mailto:tamara_smith@fws.gov]
Sent: Wednesday, October 14, 2015 12:59 PM
To: Peter Fasbender
Subject: Fwd: Lynx workshop

fyi - I think you can come down if you would like to -

----- Forwarded message -----
From: **Shull, Alisa** <alisa_shull@fws.gov>
Date: Wed, Oct 14, 2015 at 11:45 AM
Subject: Re: Lynx workshop
To: "Smith, Tamara" <tamara_smith@fws.gov>

Thanks, Tam. Looks like I won't be able to make it over. I'm interested in hearing how it goes!

Alisa

On Wed, Oct 14, 2015 at 11:12 AM, Smith, Tamara <tamara_smith@fws.gov> wrote:

Hi Alisa -

Our lynx workshop is being held at the Crowne Plaza in Bloomington - the one over by TCFO. You are welcome to stop in today or tomorrow. Our sessions will run from 8am - 5:30pm today and until 5pm tomorrow, but I'd guess we may go late both days.

We are on the 2nd floor in the room next to the business center.

Thanks,

Tam

On Wed, Oct 14, 2015 at 9:19 AM, Shull, Alisa <alisa_shull@fws.gov> wrote:

Hi Tam,

I was wondering if the lynx workshop is at the FO or RO? If you all are here in RO, I'd be interested in stopping by and sitting in to listen for a little while if that's ok.

Thanks,

Alisa

--

Alisa Shull

Chief, Division of Endangered Species

Region 3, U.S. Fish & Wildlife Service

5600 American Blvd. West, Suite 990

Bloomington, MN 55437-1458

612-713-5334

Alisa_Shull@fws.gov

--

Tamara Smith

U.S. Fish and Wildlife Service

Twin Cities Field Office

4101 American Boulevard East

Bloomington, MN 55425

612-725-3548 ext. 2219

612-600-1599 cell

--

Alisa Shull

Chief, Division of Endangered Species

Region 3, U.S. Fish & Wildlife Service

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Tamara Smith

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Tamara Smith
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Twin Cities Field Office
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Bloomington, MN 55425
612-725-3548 ext. 2219
612-600-1599 cell

From: [Bell, Heather](#)
To: [Smith, Tamara](#)
Cc: [Jim Zelenak](#); [Kurt Broderdorp](#); [Mark McCollough](#); [Mary Parkin](#); [Bryon Holt](#)
Subject: Re: Friday, October 16, 2015 to be "Minnesota Lynx Day" in Minnesota
Date: Monday, October 19, 2015 7:52:58 AM

Yes lets pretend! Thanks to everyone for great work. my brain didn't stop cogitating about all the good info all weekend!

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
Lakewood, CO 80228
303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>

On Fri, Oct 16, 2015 at 7:41 AM, Smith, Tamara <tamara_smith@fws.gov> wrote:

Today is "Minnesota Lynx Day"!

<http://mn.gov/governor/newsroom/pressreleasedetail.jsp?id=102-173610>

It's a celebration for the women's basketball team, but...maybe we can pretend the parade is for us. Good work this week, everyone!

Cheers,
Tam

--

Tamara Smith
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Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425
612-725-3548 ext. 2219
612-600-1599 cell

From: [Zelenak, Jim](#)
To: [Kylie Paul](#)
Subject: Re: lynx update?
Date: Monday, October 19, 2015 3:26:39 PM

Hi Kylie,

Just back from lynx expert elicitation meeting last week in Minneapolis for which I was frantically preparing when your email came in. Sorry about the delay in getting back to you. I'm around most of this week with just a few conference calls on my schedule if you'd like to talk lynx. Le me know or just give a call.

Hope all is well.

Jim

On Wed, Oct 7, 2015 at 12:39 PM, Kylie Paul <kpaul@defenders.org> wrote:

Hi Jim,
I'd love to chat about lynx - do you have time this week?
Thanks much!
Kylie

[\[http://sigs.defenders.org/dowlogo.gif\]](http://sigs.defenders.org/dowlogo.gif)

Kylie Paul

Rockies and Plains Representative

259 W. Front Street, Suite B
Missoula, Montana 59802

Tel: 406-728-8800 Cell: 406-370-6979

kpaul@defenders.org<<mailto:kpaul@defenders.org>> |
www.defenders.org<<http://www.defenders.org/>>

--

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From: [Bush, Jodi](#)
To: [Mark McCollough](#); [Tamara Smith](#); [Kurt Broderdorp](#); [Mary Parkin](#); [Heather Bell](#); [Seth Willey](#); [Jonathan Cummings](#); [Justin Shoemaker](#); [Jim Zelenak](#)
Subject: Lynx SSA Expert Elicitation
Date: Tuesday, October 20, 2015 9:11:51 AM

Just a quick note to say thank you for all your work last week at the SSA expert elicitation.

I appreciate the long hours and the effort expended in reworking questions and making sure the process was effective. You are consummate professionals and your efforts were truly superhuman. Thanks so much for your exertions and positive energy. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225, ext.205

From: Zelenak, Jim
To: [Bell, Heather](mailto:bell, heather)
Subject: Re: Core Team Call Today?
Date: Tuesday, October 20, 2015 9:42:53 AM

Sounds good. So far just me and Mark; Tam's out of office and Kurt and Bryon seem to be offline....

On Tue, Oct 20, 2015 at 9:40 AM, Bell, Heather <heather_bell@fws.gov> wrote:
i am going to join my branch meeting call and tell them how the lynx meeting went!

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
Lakewood, CO 80228
303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google
Site: <https://sites.google.com/a/fws.gov/rev/>

On Tue, Oct 20, 2015 at 9:23 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:
I could go either way on our normally-scheduled call from 10-11 Mountain Time. If you feel strongly one way or the other (have the call or don't), let me know.

If I don't hear back, I'll plan on dialing in and see if anyone joins.

866-857-8504
passcode: 7620543

--

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jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Jodi Bush](#)
Subject: Lynx SSA Expert Workshop
Date: Tuesday, October 20, 2015 9:54:11 AM

Not sure I have any magical words or even bad poetry...

Would just reiterate that we (you and me and all the Service regions in the DPS range) are very grateful that participants made time in their otherwise very busy schedules to join us in Minneapolis to discuss the current status and potential future influences on the lynx populations in the DPS. We especially appreciate the high quality of the presentations, particularly given the short lead times for some of them. We learned a lot from the discussion.

That we will get the workshop notes written up and out to them for their reviews as soon as we can.

That we will share the SSA report as soon as we can and that at some point we will be looking for folks willing to serve as peer reviewers for that document.

Finally, if the SSA indicates that we will be developing a recovery plan, that we will look to engage workshop participants and our other partners in that process as we move forward.

Let me know if you need anything else.

--

Jim Zelenak, Biologist
U.S. Fish and Wildlife Service
Montana Ecological Services Office
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(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Bush, Jodi](#)
To: [Mark McCollough](#); [Tamara Smith](#); [Kurt Broderdorp](#); [Mary Parkin](#); [Heather Bell](#); [Seth Willey](#); [Jonathan Cummings](#); [Justin Shoemaker](#); [Jim Zelenak](#)
Subject: Lynx SSA Expert Elicitation
Date: Tuesday, October 20, 2015 11:11:51 AM

Just a quick note to say thank you for all your work last week at the SSA expert elicitation.

I appreciate the long hours and the effort expended in reworking questions and making sure the process was effective. You are consummate professionals and your efforts were truly superhuman. Thanks so much for your exertions and positive energy. JB

Jodi L. Bush
Field Supervisor
Montana Ecological Services Office
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(406) 449-5225, ext.205

From: Zicari, Laury
To: McCollough, Mark
Subject: Re: weekly updates for the RD et al
Date: Tuesday, October 20, 2015 2:47:33 PM

THANKS!!!!!!! I entered it into the system!

On Tue, Oct 20, 2015 at 4:32 PM, McCollough, Mark <mark_mccollough@fws.gov> wrote:
No...I did not see anyone with a camera at the lynx meeting and I didn't even think of it. I would be willing to write up a summary:

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other ideas? Thanks -- please get em to me by noon Wednesday. thanks

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Laury Zicari
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From: [Bush, Jodi](#)
To: [kmckelvey@fs.fed.us](#); [erin.simons@maine.edu](#); [Vashon, Jennifer](#); [rmoen@d.umn.edu](#); [scatton@fs.fed.us](#); [jsquires@fs.fed.us](#); [Jay Kolbe](#); [Maletzke, Benjamin T \(DFW\)](#); [Jake Ivan - DNR](#); [jeff.bowman@ontario.ca](#)
Cc: [Jim Zelenak](#); [Mark McCollough](#); [Tamara Smith](#); [Kurt Broderdorp](#); [Bryon Holt](#); [Heather Bell](#); [Mary Parkin](#); [Jonathan Cummings](#)
Subject: Fwd: Lynx SSA Expert Elicitation
Date: Tuesday, October 20, 2015 3:05:51 PM

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From: [Bush, Jodi](#)
To: [Jackson, Scott -FS](#); michaelkschwartz@fs.fed.us; karen.hodges@ubc.ca; jlawler@u.washington.edu; frei001@umn.edu; [asiren](#)
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From: [McCollough, Mark](#)
To: [Zicari, Laury](#)
Subject: Re: weekly updates for the RD et al
Date: Tuesday, October 20, 2015 4:32:23 PM

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From: [Smith, Tamara](#)
To: [Jackson, Scott -FS](#)
Subject: Re: lynx regulatory environment presentation
Date: Wednesday, October 21, 2015 7:55:47 AM
Attachments: [image006.png](#)
[image002.png](#)
[image004.png](#)
[image008.png](#)

Thank you Scott! I will replace your other presentation with this one.
We appreciate the time you gave to this workshop!

Thank you,
Tam

On Tue, Oct 20, 2015 at 2:51 PM, Jackson, Scott -FS <sjackson03@fs.fed.us> wrote:

Hi Tam,

I've attached my power point presentation from last week's lynx expert elicitation meeting. It is the same as the one I gave you to load onto your computer last week, except that I deleted a bunch of extra slides I had in that file that were just in there for my reference (but that didn't get used). Please replace the previous file with this file for the record. Thanks much!

If there are questions, please let me know. I appreciate the work you and others at FWS went to to put this meeting together. Not an easy task, but was a good way to exchange interesting information.

Thanks!



Scott Jackson
National Carnivore Program Leader
Forest Service

Northern Regional Office

p: 406-329-3664

f: 406-329-3171

sjackson03@fs.fed.us

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Missoula, MT 59804

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Caring for the land and serving people

--

Tamara Smith
U.S. Fish and Wildlife Service
Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425
612-725-3548 ext. 2219
612-600-1599 cell

From: Jakubas, Walter
To: ["McCullough, Mark"; Laury Zicari](#)
Cc: [Vashon, Jennifer](#); [Connolly, James](#); [Haskell, Shawn](#)
Subject: Lynx Genomics Proposal
Date: Wednesday, October 21, 2015 8:27:51 AM
Attachments: [Lynx Genomics Project Statement 10.21.2015.docx](#)

Mark and Laury,

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Wally

From: Zicari, Laury
To: [Martin Miller](#); [Mary Parkin](#)
Subject: Fwd: Lynx Genomics Proposal
Date: Wednesday, October 21, 2015 9:31:59 AM
Attachments: [Lynx Genomics Project Statement 10.21.2015.docx](#)

It saddens me if we were not provided the opportunity to have input into this as the lead office for lynx in the East. Perhaps Jim Z was engaged in its review as recovery lead.

----- Forwarded message -----

From: **Jakubas, Walter** <Walter.Jakubas@maine.gov>
Date: Wed, Oct 21, 2015 at 10:27 AM
Subject: Lynx Genomics Proposal
To: "McCullough, Mark" <mark_mccollough@fws.gov>, Laury Zicari <laury_zicari@fws.gov>
Cc: "Vashon, Jennifer" <Jennifer.Vashon@maine.gov>, "Connolly, James" <James.Connolly@maine.gov>, "Haskell, Shawn" <Shawn.Haskell@maine.gov>

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From: Zicari, Laury
To: [Jim Zelenak](mailto:Jim.Zelenak)
Cc: [Mark McCollough](mailto:Mark.McCollough)
Subject: Fwd: Lynx Genomics Proposal
Date: Wednesday, October 21, 2015 9:34:53 AM
Attachments: [Lynx Genomics Project Statement 10.21.2015.docx](#)

Not sure if they coordinated with you, Jim.

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From: [Zelenak, Jim](#)
To: [Zicari, Laury](#)
Cc: [Mark McCollough](#)
Subject: Re: Lynx Genomics Proposal
Date: Wednesday, October 21, 2015 9:44:55 AM

First I've heard of it. Wonder if it is OK to forward to Mike Schwartz, the Forest Service's Director of the National Genomics Center for Wildlife and Fish Conservation?

Your thoughts?

On Wed, Oct 21, 2015 at 9:34 AM, Zicari, Laury <laury_zicari@fws.gov> wrote:

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To: "McCollough, Mark" <mark_mccollough@fws.gov>, Laury Zicari <laury_zicari@fws.gov>

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jim_zelenak@fws.gov

From: [Zelenak, Jim](#)
To: [Zicari, Laury](#)
Cc: [Mark McCollough](#)
Subject: Re: Lynx Genomics Proposal
Date: Wednesday, October 21, 2015 11:18:42 AM

They also (p. 4) refer to the "contiguous North American DPS..." - I'm not sure what that is....

On Wed, Oct 21, 2015 at 10:47 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Just glancing thru this, I see some issues. I will try to spend time on those and send along, but, just initially:

1. They cite the 2014 Fed. Reg. when noting the 2000 listing of the DPS;
2. Their distribution map shows Utah and Oregon as part of the "entire North American" distribution, but they do not include North (16 verified records) and South Dakota (10) and Nebraska (13) - all 3 of these states have as many or more verified records of lynx than do Utah (10) or Oregon (12);
3. They say: "Forestry in Maine likely has mimicked to some degree the "natural" disturbances that occurred pre-forestry, such as disease and windthrow, and those that occur in the boreal forest such as fire." But they do not acknowledge that forestry practices in Maine have likely resulted in a much greater proportion of the landscape currently being in young regeneration stage than probably ever occurred historically due to natural disturbance factors and patterns;
4. They say: "The historic, current, and future status of Canada lynx in Maine has been a matter of speculation, resultant in lynx being listed as a single DPS under the Endangered Species Act (ESA) in 2000." I do not agree that speculation about the historic, current and future status of lynx in Maine is what led the Service to list lynx in the Lower 48 as a single DPS - I'm aware of no support for this contention.
5. They also say: " The Canada lynx is a unique model on which to apply conservation genomics tools as lynx have historically gone through a documented decline that has affected genetic variation and fitness (McKelvey et al., 2000), ..." I do not agree that McKelvey et al. 2000 (which could be referring to any of 4 chapters [2, 8, 10, or 15] in Ruggiero et al. 2000 [Ecology and Conservation of lynx in the U.S.] demonstrates or even suggests, in any of those 4 chapters, a "documented decline that has affected genetic variation and fitness." Mark - let me know if you disagree, but I don't see anything in those chapters (in the abstracts, introductions, or summary sections, anyway) that show a documented decline with the genetic consequences suggested in this Genomics proposal/project statement.

Just a few thoughts/concerns.

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From: [Schwartz, Michael K -FS](#)
To: [Zelenak, Jim](#)
Subject: RE: Lynx Genomics Proposal
Date: Wednesday, October 21, 2015 1:56:59 PM

Hi Jim,

I have much concern about this. I'm in the Denver airport now, but can call you tomorrow.

I did know a bit about this. But thanks for sending. Good to see you last week.

Mike

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Wednesday, October 21, 2015 12:07 PM
To: Schwartz, Michael K -FS
Subject: Fwd: Lynx Genomics Proposal

Hey Mike,

Wondering if you have seen this lynx genomics proposal (attached). I found some things that give me a little concern from an ESA perspective (below), but was wondering if you could take a look and let me know your thoughts on its genetics/genomics merits.

Just glancing through this, I see some potential issues.

1. Their distribution map shows Utah and Oregon as part of the "complete North American" distribution, but they do not include North (16 verified records) and South Dakota (10) and Nebraska (13) - all 3 of these states have as many or more verified records of lynx than do Utah (10) or Oregon (12);
2. They say: "Forestry in Maine likely has mimicked to some degree the "natural" disturbances that occurred pre-forestry, such as disease and windthrow, and those that occur in the boreal forest such as fire." But they do not acknowledge that forestry practices in Maine have likely resulted in a much greater proportion of the landscape currently being in young regeneration stage than probably ever occurred historically due to natural disturbance factors and patterns;
3. They say: "The historic, current, and future status of Canada lynx in Maine has been a matter of speculation, resultant in lynx being listed as a single DPS under the Endangered Species Act (ESA) in 2000." I do not agree that speculation about the historic, current and future status of lynx in Maine is what led the Service to list lynx in the Lower 48 as a single DPS - I'm aware of no support for this contention.
4. They also say: " The Canada lynx is a unique model on which to apply conservation genomics tools as lynx have historically gone through a documented decline that has affected genetic variation and fitness (McKelvey et al., 2000), ..." I do not agree that McKelvey et al. 2000 (which could be referring to any of 4 chapters [2, 8, 10, or 15] in Ruggiero et al. 2000 [Ecology and Conservation of lynx in the U.S.] demonstrates or even suggests, in any of those 4 chapters, a "documented decline that has affected genetic variation and fitness." I don't see anything in those chapters (in the abstracts, introductions, or summary sections, anyway) that show a documented decline with the genetic consequences suggested in this Genomics proposal/project statement.

5. They also (p. 4) refer to the "contiguous North American DPS..." - I'm not sure what that is.....

Appreciate any thoughts you have time to share.

Thanks, and also thanks again for your participation in the lynx SSA expert elicitation workshop - wish you could have stuck around for more of the fun....

Jim

----- Forwarded message -----

From: **Zicari, Laury** <laury_zicari@fws.gov>
Date: Wed, Oct 21, 2015 at 9:34 AM
Subject: Fwd: Lynx Genomics Proposal
To: Jim Zelenak <jim_zelenak@fws.gov>
Cc: Mark McCollough <mark_mccollough@fws.gov>

Not sure if they coordinated with you, Jim.

----- Forwarded message -----

From: **Jakubas, Walter** <Walter.Jakubas@maine.gov>
Date: Wed, Oct 21, 2015 at 10:27 AM
Subject: Lynx Genomics Proposal
To: "McCollough, Mark" <mark_mccollough@fws.gov>, Laury Zicari <laury_zicari@fws.gov>
Cc: "Vashon, Jennifer" <Jennifer.Vashon@maine.gov>, "Connolly, James" <James.Connolly@maine.gov>, "Haskell, Shawn" <Shawn.Haskell@maine.gov>

Mark and Laury,

Talking to Mark yesterday, I realized that he was not aware of a new Lynx Genomics study is just getting underway. Attached is the project statement for the proposal. Principal Investigators include John Organ, USGS; Todd Fuller, University of Massachusetts, Amherst; Steve DeStefano, Massachusetts Cooperative Fish and Wildlife Research Unit at UMass Amherst; Tanya Lama, Ph.D. student at the Mass Coop Unit/UMass Amherst; and Warren Johnson, Smithsonian Institution. Jen will help advise Tanya. Michael Hofreiter, Potsdam University, Brandenburg, Germany, and some of his colleagues that have worked on Iberian Lynx will also be cooperating on the study.

Wally

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From: [Zelenak, Jim](#)
To: [Shoemaker, Justin](#)
Cc: [Mark McCollough](#); [Tamara Smith](#); [Kurt Broderdorp](#); [Bryon Holt](#); [Jodi Bush](#); [Seth Willey](#); [Heather Bell](#); [Mary Parkin](#); [Jonathan Cummings](#)
Subject: Re: Lynx meeting notes
Date: Thursday, October 22, 2015 11:18:31 AM

Will do (am doing).

Core Team: If you have additions to the notes, please add them in editing mode, as Heather recommended. Insert comments if you have questions on any of the compiled notes or if you feel additional follow-up with experts may be necessary.

Thanks,

Jim

On Thu, Oct 22, 2015 at 10:49 AM, Shoemaker, Justin <justin_shoemaker@fws.gov> wrote:
Great. Can you notify the group?

Justin Shoemaker
Senior Listing Biologist
U.S. Fish and Wildlife Service, Region 6
1511 47th Avenue, Moline, IL 61265
Phone: 309-757-5800 ext. 214
Email: justin_shoemaker@fws.gov

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Thanks Justin.

Heather created a "Workshop notes" folder within the "Workshop Materials" folder:

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From: Zelenak, Jim
To: Cummings, Jonathan
Cc: Shoemaker, Justin; Mark McCollough; Tamara Smith; Kurt Broderdorp; Bryon Holt; Jodi Bush; Seth Willey; Heather Bell; Mary Parkin
Subject: Re: Lynx meeting notes
Date: Thursday, October 22, 2015 11:30:17 AM

Heather suggested edit mode, though it may be nice to be able to "track changes."

On Thu, Oct 22, 2015 at 11:24 AM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:
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jim_zelenak@fws.gov

From: [McCollough, Mark](#)
To: [Zelenak, Jim](#); [Laury Zicari](#)
Subject: Re: Lynx Genomics Proposal
Date: Thursday, October 22, 2015 12:38:03 PM

Jim:

I finally had a chance to read the Maine genetics proposal today.

To answer your question, MDIFW probably has several dozen lynx carcasses in their freezers from trapping and road mortalities.

As you indicate, the introduction contains several scientific and policy inaccuracies about lynx status and policy. There is a paucity of citing UMaine published research that contrast with some of the conclusions about lynx history, status, and future made in the proposal.

The effort, in part, seems focused on finding genetic differences worthy of designating the Maine population as a DPS. This is explicitly stated in objective 2 on p.5.

It would be interesting to hear Mike Schwartz's thoughts on this proposal. I thought he said last week that there was a need to use the domestic cat genome as a tool to look more broadly at genetic structuring in lynx populations. UMass and MDIFW seem to indicate they will sequence the entire lynx and bobcat genomes. I can't explain why Jen Vashon did not bring this up last week. I wonder if Mike sees a value in sequencing/mapping the lynx and bobcat genomes, and whether this would advance the science of lynx genetics across the range, including his lab. It would seem like a valuable thing to do.

When one considers a map of Maine and eastern Canada, it is obvious that Maine's lynx population is part of a metapopulation in southern Quebec and northern New Brunswick - there is nothing on the landscape that currently restricts lynx movements in this region south of the St. Lawrence, and we know lynx disperse widely within this region.

More interesting genetic questions arise in nearby island populations like Cape Breton and Newfoundland, but these seem not to be part of the study. The Koen et al. paper examining genetic relationships between eastern Canadian lynx populations is not cited in the proposal. Were they researchers not aware of this work? Are they duplicating this work? or chose not to acknowledge this work?

Unlike the recent Koen et al. study, the focus of this genetic analysis focused primarily from Maine specimens. How will conclusions be reached without genetic samples from adjacent regions of Canada? This seems to be a limited approach and raises questions about the motivation behind the study (i.e., finding something to justify a Maine DPS). The authors indicate that lynx genetic samples from elsewhere in the range will be obtained from the Smithsonian Frozen Collection "or partners yet identified." The Rocky Mountain Research Lab and Jeff Bowman/Dennis Murray probably have the largest bank of genetic material. Will they contribute or participate in this study?

In objective 3 the authors posit there was a recent population decline in lynx in Maine, yet the science (and MDIFW's presentation last week) indicates lynx and their habitat increased since the post-budworm salvage harvesting in the 1980s. Which is it? They also hypothesize less

genetic diversity in Maine lynx than in interior Canada. Didn't Koen et al. already examine this?

It seems that Mike Schwartz has already evaluated the bobcat/lynx hybridization issue. Will this approach possibly provide new interpretation?

It looks like this project will conclude Dec. 2018 - after we complete a recovery plan.

It would be interesting to hear Mike's thoughts on whether this represents a "significant scientific achievement (p. 11)." Could it advance our ability to evaluate lynx genetics rangewide?

I wonder how the project is funded? I don't believe Section 6 funds are being used.

I learned lots of new terms including "the field of bioinformatics" (p. 6). Is that what we did in Minneapolis last week???? Meanwhile, if you find any "pipelines for genome annotation" (p. 6) lying around, please send one too me. My pipeline is clogged...

Mark

On Thu, Oct 22, 2015 at 9:18 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

I wondered about the intent, too - whether this is about seeking support for the idea that the northeast ought to be a separate DPS.

Where are the lynx from that are going to NH for necropsy, and what was cause of death?

I'll let you know if I hear from Mike Schwartz today. I will ask him if he thinks I ought to send this proposal to Jeff Bowman and Dennis Murray as well. I'd really like several opinions on the merits of this project. Given all the errors I found in just a quick reading, I'm a little suspect.

Hope you had fun in the field and that you have worked out the sampling design for the study of wind power effects to lynx!

On Thu, Oct 22, 2015 at 6:30 AM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Jim:

I was in the field yesterday on a site visit for the Number 9 wind project (proposed 120 turbines covering 150 square miles of lynx critical habitat) and have not had a chance to review the genetics proposal.

I found out about the study on Tuesday when MDIFW called asking if permits were needed to transfer some lynx to the Univ. of NH for necropsy in a wildlife class. I asked if they would save genetic samples given all we discussed about lynx genetics in MN the week previous. They said they would be saving genetic samples for their lynx genomics study at UMass. "What lynx genomics study?" This is the first that I had heard of this. I found it disingenuous that this was not brought up with the lynx expert group last week. Is the purpose possibly to show genetic distinctness to justify a DPS? Why are they not involving Mike, Jeff, Dennis and others who have been working with lynx genetics

We try to be open and inclusive. MDIFW is invited by UMaine to be coauthor on published papers, committees for graduate students, etc. We keep the State promptly informed on lynx policy and accommodated their requests last week as best we could. Then we get blind-sided. Perhaps you can see why some people have recently expressed frustration in Maine...

Mark

Mark

On Wed, Oct 21, 2015 at 4:55 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Regarding (5) in my previous, in lit cited they show the Chapter 8 McKelvey et al. 2000 (History and Distribution of lynx in the contiguous US). I searched that document for "decline," "genetic," "fitness," and "variation." I found nothing in that document that said what the genomics proposal said it says.

I did forward this to Mike Schwartz. He replied that he has "much concern" about this, had heard a bit about it previously, and that he will call me to discuss it when he is back in the office after traveling (maybe tomorrow). I'll let you know what I hear from him.

On Wed, Oct 21, 2015 at 11:18 AM, Zicari, Laury <laury_zicari@fws.gov> wrote:

Jim thanks for your thoughtful comments.

and FYI Mark is out in the field (inspecting a proposed wind power project in lynx CH east of the interstate up in the Country, and a place where prime habitat exists while the habitat in the area of the State's 12 year study is going to be aging out, falling out of HVHH, if I understand correctly. Is that right, Mark?

On Wed, Oct 21, 2015 at 12:47 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Just glancing thru this, I see some issues. I will try to spend time on those and send along, but, just initially:

1. They cite the 2014 Fed. Reg. when noting the 2000 listing of the DPS;
2. Their distribution map shows Utah and Oregon as part of the "entire North American" distribution, but they do not include North (16 verified records) and South Dakota (10) and Nebraska (13) - all 3 of these states have as many or more verified records of lynx than do Utah (10) or Oregon (12);
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those chapters (in the abstracts, introductions, or summary sections, anyway) that show a documented decline with the genetic consequences suggested in this Genomics proposal/project statement.

Just a few thoughts/concerns.

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Not sure if they coordinated with you, Jim.

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From: **Jakubas, Walter** <Walter.Jakubas@maine.gov>

Date: Wed, Oct 21, 2015 at 10:27 AM

Subject: Lynx Genomics Proposal

To: "McCollough, Mark" <mark_mccollough@fws.gov>, Laury Zicari <laury_zicari@fws.gov>

Cc: "Vashon, Jennifer" <Jennifer.Vashon@maine.gov>, "Connolly, James" <James.Connolly@maine.gov>, "Haskell, Shawn" <Shawn.Haskell@maine.gov>

Mark and Laury,

Talking to Mark yesterday, I realized that he was not aware of a new Lynx Genomics study is just getting underway. Attached is the project statement for the proposal. Principal Investigators include John Organ, USGS; Todd Fuller, University of Massachusetts, Amherst; Steve DeStefano, Massachusetts Cooperative Fish and Wildlife Research Unit at UMass Amherst; Tanya Lama, Ph.D. student at the Mass Coop Unit/UMass Amherst; and Warren Johnson, Smithsonian Institution. Jen will help advise Tanya. Michael Hofreiter, Potsdam University, Brandenburg, Germany, and some of his colleagues that have worked on Iberian Lynx will also be cooperating on the study.

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From: [Zelenak, Jim](#)
To: [Shoemaker, Justin](#)
Subject: Re: Lynx meeting notes
Date: Thursday, October 22, 2015 1:16:53 PM

I put the notes in the share drive folder, opened with google doc, then deleted the original as Heather recommended so that Core Team folks can add any additional notes they may have collected.

Thanks again for all the help with these - they look good.

Jim

On Thu, Oct 22, 2015 at 10:13 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Thanks Justin.

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From: [Jim Zelenak \(via Google Drive\)](#)
To: mark_mccollough@fws.gov
Cc: tamara_smith@fws.gov; bryon_holt@fws.gov; kurt_broderdorp@fws.gov
Subject: 2015 10 22 Lynx SSA Expert Elicitation Workshop - Notes - JShoemaker.docx
Date: Thursday, October 22, 2015 1:22:04 PM

[jim_zelenak@fws.gov](#) has shared the following document:



[2015 10 22 Lynx SSA Expert Elicitation Workshop - Notes - JShoemaker.docx](#)



Justin sent the workshop notes - please review and edit as you see fit.

Open

Google Drive: Have all your files within reach from any device.



From: [Bell, Heather](#)
To: [Zelenak, Jim](#)
Cc: [Cummings, Jonathan](#); [Shoemaker, Justin](#); [Mark McCollough](#); [Tamara Smith](#); [Kurt Broderdorp](#); [Bryon Holt](#); [Jodi Bush](#); [Seth Willey](#); [Mary Parkin](#)
Subject: Re: Lynx meeting notes
Date: Thursday, October 22, 2015 2:17:12 PM

whatever you want! suggestion mode is good if we can tell who's is who's!

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
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303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>

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Subject: Re: Lynx Genomics Proposal
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As you indicate, the introduction contains several scientific and policy inaccuracies about lynx status and policy. There is a paucity of citing UMaine published research that contrast with some of the conclusions about lynx history, status, and future made in the proposal.

The effort, in part, seems focused on finding genetic differences worthy of designating the Maine population as a DPS. This is explicitly stated in objective 2 on p.5.

It would be interesting to hear Mike Schwartz's thoughts on this proposal. I thought he said last week that there was a need to use the domestic cat genome as a tool to look more broadly at genetic structuring in lynx populations. UMass and MDIFW seem to indicate they will sequence the entire lynx and bobcat genomes. I can't explain why Jen Vashon did not bring this up last week. I wonder if Mike sees a value in sequencing/mapping the lynx and bobcat genomes, and whether this would advance the science of lynx genetics across the range, including his lab. It would seem like a valuable thing to do.

When one considers a map of Maine and eastern Canada, it is obvious that Maine's lynx population is part of a metapopulation in southern Quebec and northern New Brunswick - there is nothing on the landscape that currently restricts lynx movements in this region south of the St. Lawrence, and we know lynx disperse widely within this region.

More interesting genetic questions arise in nearby island populations like Cape Breton and Newfoundland, but these seem not to be part of the study. The Koen et al. paper examining genetic relationships between eastern Canadian lynx populations is not cited in the proposal. Were they researchers not aware of this work? Are they duplicating this work? or chose not to acknowledge this work?

Unlike the recent Koen et al. study, the focus of this genetic analysis focused primarily from Maine specimens. How will conclusions be reached without genetic samples from adjacent regions of Canada? This seems to be a limited approach and raises questions about the motivation behind the study (i.e., finding something to justify a Maine DPS). The authors indicate that lynx genetic samples from elsewhere in the range will be obtained from the Smithsonian Frozen Collection "or partners yet identified." The Rocky Mountain Research Lab and Jeff Bowman/Dennis Murray probably have the largest bank of genetic material. Will they contribute or participate in this study?

In objective 3 the authors posit there was a recent population decline in lynx in Maine, yet the science (and MDIFW's presentation last week) indicates lynx and their habitat increased since the post-budworm salvage harvesting in the 1980s. Which is it? They also hypothesize less

genetic diversity in Maine lynx than in interior Canada. Didn't Koen et al. already examine this?

It seems that Mike Schwartz has already evaluated the bobcat/lynx hybridization issue. Will this approach possibly provide new interpretation?

It looks like this project will conclude Dec. 2018 - after we complete a recovery plan.

It would be interesting to hear Mike's thoughts on whether this represents a "significant scientific achievement (p. 11)." Could it advance our ability to evaluate lynx genetics rangewide?

I wonder how the project is funded? I don't believe Section 6 funds are being used.

I learned lots of new terms including "the field of bioinformatics" (p. 6). Is that what we did in Minneapolis last week???? Meanwhile, if you find any "pipelines for genome annotation" (p. 6) lying around, please send one too me. My pipeline is clogged...

Mark

On Thu, Oct 22, 2015 at 9:18 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

I wondered about the intent, too - whether this is about seeking support for the idea that the northeast ought to be a separate DPS.

Where are the lynx from that are going to NH for necropsy, and what was cause of death?

I'll let you know if I hear from Mike Schwartz today. I will ask him if he thinks I ought to send this proposal to Jeff Bowman and Dennis Murray as well. I'd really like several opinions on the merits of this project. Given all the errors I found in just a quick reading, I'm a little suspect.

Hope you had fun in the field and that you have worked out the sampling design for the study of wind power effects to lynx!

On Thu, Oct 22, 2015 at 6:30 AM, McCollough, Mark <mark_mccollough@fws.gov> wrote:

Jim:

I was in the field yesterday on a site visit for the Number 9 wind project (proposed 120 turbines covering 150 square miles of lynx critical habitat) and have not had a chance to review the genetics proposal.

I found out about the study on Tuesday when MDIFW called asking if permits were needed to transfer some lynx to the Univ. of NH for necropsy in a wildlife class. I asked if they would save genetic samples given all we discussed about lynx genetics in MN the week previous. They said they would be saving genetic samples for their lynx genomics study at UMass. "What lynx genomics study?" This is the first that I had heard of this. I found it disingenuous that this was not brought up with the lynx expert group last week. Is the purpose possibly to show genetic distinctness to justify a DPS? Why are they not involving Mike, Jeff, Dennis and others who have been working with lynx genetics

We try to be open and inclusive. MDIFW is invited by UMaine to be coauthor on published papers, committees for graduate students, etc. We keep the State promptly informed on lynx policy and accommodated their requests last week as best we could. Then we get blind-sided. Perhaps you can see why some people have recently expressed frustration in Maine...

Mark

Mark

On Wed, Oct 21, 2015 at 4:55 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Regarding (5) in my previous, in lit cited they show the Chapter 8 McKelvey et al. 2000 (History and Distribution of lynx in the contiguous US). I searched that document for "decline," "genetic," "fitness," and "variation." I found nothing in that document that said what the genomics proposal said it says.

I did forward this to Mike Schwartz. He replied that he has "much concern" about this, had heard a bit about it previously, and that he will call me to discuss it when he is back in the office after traveling (maybe tomorrow). I'll let you know what I hear from him.

On Wed, Oct 21, 2015 at 11:18 AM, Zicari, Laury <laury_zicari@fws.gov> wrote:

Jim thanks for your thoughtful comments.

and FYI Mark is out in the field (inspecting a proposed wind power project in lynx CH east of the interstate up in the Country, and a place where prime habitat exists while the habitat in the area of the State's 12 year study is going to be aging out, falling out of HVHH, if I understand correctly. Is that right, Mark?

On Wed, Oct 21, 2015 at 12:47 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Just glancing thru this, I see some issues. I will try to spend time on those and send along, but, just initially:

1. They cite the 2014 Fed. Reg. when noting the 2000 listing of the DPS;
2. Their distribution map shows Utah and Oregon as part of the "entire North American" distribution, but they do not include North (16 verified records) and South Dakota (10) and Nebraska (13) - all 3 of these states have as many or more verified records of lynx than do Utah (10) or Oregon (12);
3. They say: "Forestry in Maine likely has mimicked to some degree the "natural" disturbances that occurred pre-forestry, such as disease and windthrow, and those that occur in the boreal forest such as fire." But they do not acknowledge that forestry practices in Maine have likely resulted in a much greater proportion of the landscape currently being in young regeneration stage than probably ever occurred historically due to natural disturbance factors and patterns;
4. They say: "The historic, current, and future status of Canada lynx in Maine has been a matter of speculation, resultant in lynx being listed as a single DPS under the Endangered Species Act (ESA) in 2000." I do not agree that speculation about the historic, current and future status of lynx in Maine is what led the Service to list lynx in the Lower 48 as a single DPS - I'm aware of no support for this contention.
5. They also say: " The Canada lynx is a unique model on which to apply conservation genomics tools as lynx have historically gone through a documented decline that has affected genetic variation and fitness (McKelvey et al., 2000), ..." I do not agree that McKelvey et al. 2000 (which could be referring to any of 4 chapters [2, 8, 10, or 15] in Ruggiero et al. 2000 [Ecology and Conservation of lynx in the U.S.]) demonstrates or even suggests, in any of those 4 chapters, a "documented decline that has affected genetic variation and fitness." Mark - let me know if you disagree, but I don't see anything in

those chapters (in the abstracts, introductions, or summary sections, anyway) that show a documented decline with the genetic consequences suggested in this Genomics proposal/project statement.

Just a few thoughts/concerns.

On Wed, Oct 21, 2015 at 9:34 AM, Zicari, Laury <laury_zicari@fws.gov> wrote:

Not sure if they coordinated with you, Jim.

----- Forwarded message -----

From: **Jakubas, Walter** <Walter.Jakubas@maine.gov>

Date: Wed, Oct 21, 2015 at 10:27 AM

Subject: Lynx Genomics Proposal

To: "McCollough, Mark" <mark_mccollough@fws.gov>, Laury Zicari <laury_zicari@fws.gov>

Cc: "Vashon, Jennifer" <Jennifer.Vashon@maine.gov>, "Connolly, James" <James.Connolly@maine.gov>, "Haskell, Shawn" <Shawn.Haskell@maine.gov>

Mark and Laury,

Talking to Mark yesterday, I realized that he was not aware of a new Lynx Genomics study is just getting underway. Attached is the project statement for the proposal. Principal Investigators include John Organ, USGS; Todd Fuller, University of Massachusetts, Amherst; Steve DeStefano, Massachusetts Cooperative Fish and Wildlife Research Unit at UMass Amherst; Tanya Lama, Ph.D. student at the Mass Coop Unit/UMass Amherst; and Warren Johnson, Smithsonian Institution. Jen will help advise Tanya. Michael Hofreiter, Potsdam University, Brandenburg, Germany, and some of his colleagues that have worked on Iberian Lynx will also be cooperating on the study.

Wally

--

Laury Zicari
Field Supervisor
Maine Field Office
17 Godfrey Drive, Suite 2
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207-866-3344 x 1111
Fax 866-3351
Cell 207-949-0561

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Phone 207 866-3344 x115
Cell Phone: 207 944-5709
mark_mccollough@fws.gov

From: Belleman, Ann
To: [Malick Wahls, Sarah - FS](#)
Cc: [Susan Catton](#)
Subject: Draft BO for SNF's 22 Special Use Permits on 4 RDs
Date: Thursday, October 22, 2015 3:12:42 PM
Attachments: [2015-F-0233_SNF_Special_Use_Rds_KawLauToftGunf_RDs_DRAFT_BO_ab_09012015.doc](#)

Hi Sarah,

Please share with others at your discretion and review the attached draft BO. If you decide to include any edits/comments in the document itself, do so using Track Changes, colored font, or some other means for me to easily identify your edits.

You'll notice some yellow highlights - they're mostly for me, as I need to fill in some blanks.

Let me know if you have any questions! Ann

Ann Belleman
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4101 American Blvd. E
Bloomington, MN 55425-1665

ann_belleman@fws.gov

(307) 421-5839 (work cell)
(612) 725-3548 (Bloomington, MN)

From: [Bell, Heather](#)
To: [Zelenak, Jim](#)
Cc: [Cummings, Jonathan](#); [Shoemaker, Justin](#); [Mark McCollough](#); [Tamara Smith](#); [Kurt Broderdorp](#); [Bryon Holt](#); [Jodi Bush](#); [Seth Willey](#); [Mary Parkin](#)
Subject: Re: Lynx meeting notes
Date: Thursday, October 22, 2015 4:17:12 PM

whatever you want! suggestion mode is good if we can tell who's is who's!

Heather Bell
Ecological Services HQ
Branch of Conservation Integration
SSA Framework Team Lead
Remotely Located at
134 S. Union Blvd
Lakewood, CO 80228
303-236-4514

Check it out! SSA Framework - Google Site for Staff
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>

On Thu, Oct 22, 2015 at 11:30 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:
Heather suggested edit mode, though it may be nice to be able to "track changes."

On Thu, Oct 22, 2015 at 11:24 AM, Cummings, Jonathan <jwcummings@usgs.gov> wrote:
Do you mean for us to add any of our notes in suggestion mode (similar to track changes) or edit mode (which directly makes the edits)?

On Thu, Oct 22, 2015 at 1:18 PM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:
Will do (am doing).

Core Team: If you have additions to the notes, please add them in editing mode, as Heather recommended. Insert comments if you have questions on any of the compiled notes or if you feel additional follow-up with experts may be necessary.

Thanks,

Jim

On Thu, Oct 22, 2015 at 10:49 AM, Shoemaker, Justin <justin_shoemaker@fws.gov> wrote:

Great. Can you notify the group?

Justin Shoemaker
Senior Listing Biologist
U.S. Fish and Wildlife Service, Region 6
1511 47th Avenue, Moline, IL 61265
Phone: 309-757-5800 ext. 214
Email: justin_shoemaker@fws.gov

On Thu, Oct 22, 2015 at 11:13 AM, Zelenak, Jim <jim_zelenak@fws.gov> wrote:

Thanks Justin.

Heather created a "Workshop notes" folder within the "Workshop Materials" folder:

<https://drive.google.com/drive/folders/0BxeUAgASF6g0bXhIM0ZvU2tmZ2M>

I can drop this in there and then open it so we all can work on the google doc version.

On Thu, Oct 22, 2015 at 9:45 AM, Shoemaker, Justin

<justin_shoemaker@fws.gov> wrote:

Jim,

Here are the notes. Do we have a google drive folder set up yet? I wasn't sure if I should start one or what.

Justin Shoemaker
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Email: justin_shoemaker@fws.gov

--

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--

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--

Jonathan W. Cummings, PhD
Research Ecologist
USGS - Patuxent Wildlife Research Center (remotely located)

12100 Beech Forest Road
Laurel, MD 20708 USA
jwcummings@usgs.gov
<https://profile.usgs.gov/jwcummings>

Remote Contact Info:

Ph: 802-999-8684
243 Locust St
Dover, NH 03820

--

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jim_zelenak@fws.gov

From: [Alexej Siren](#)
To: "[Zelenak, Jim](#)"
Subject: RE: Pierce and Cayan 2013
Date: Thursday, October 22, 2015 8:35:00 PM

Hello Jim,

You are welcome. I thought it was a good process, especially the final day. It was very interesting to see the probability of persistence figures that the experts created. I think those did a fairly good job at telling the story for each region.

I look forward to looking over the draft notes in the near future.

Take care,

Alexej

From: Zelenak, Jim [mailto:jim_zelenak@fws.gov]
Sent: Thursday, October 22, 2015 5:30 PM
To: Alexej Siren <asiren@umass.edu>
Subject: Re: Pierce and Cayan 2013

Hey Alexej,

Thanks a lot for sending these documents, and for making the time to participate in the lynx workshop last week. We will send around draft notes for participant review probably next week.

Jim

On Fri, Oct 16, 2015 at 11:15 AM, Alexej Siren <asiren@umass.edu> wrote:

|

--

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U.S. Fish and Wildlife Service
Montana Ecological Services Office
585 Shepard Way, Suite 1
Helena, MT 59601
(406) 449-5225 ext. 220
jim_zelenak@fws.gov

From: [Holt, Bryon](#)
To: [Sue Livingston](#); [Jim Zelenak](#)
Subject: Re: FW: Lynx SSA letter sent to Oregon Department of Fish and Wildlife
Date: Friday, October 23, 2015 2:08:17 PM

Thanks Sue.

Jim - FYI

Bryon

On Tue, Oct 6, 2015 at 4:33 PM, Sue Livingston <sue_livingston@fws.gov> wrote:

Hi Bryon,

Never heard back from ODFW RE another contact for the lynx SSE, so I bugged them again today. You can add Ron Anglin to the list (Ronald.e.anglin@state.or.us). Ron is ODFW's Wildlife Division Administrator. They have recently hired a furbearer biologist, who will be starting later this month and he will be added to the list upon arrival.

Sue

From: Ronald Anglin [mailto:ronald.e.anglin@state.or.us]
Sent: Tuesday, October 06, 2015 4:20 PM
To: Sue Livingston
Cc: rod.w.krahmer@state.or.us
Subject: RE: Lynx SSA letter sent to Oregon Department of Fish and Wildlife

Hi Sue,

For now keep me in the loop. On the 19th our new carnivore bio will be starting and I will plug him into this conversation.

Thanks

Sent from my Verizon Wireless 4G LTE smartphone

----- Original message -----

From: Sue Livingston <sue_livingston@fws.gov>

Date: 10/06/2015 3:55 PM (GMT-08:00)

To: ronald.e.anglin@state.or.us

Cc: rod.w.krahmer@state.or.us

Subject: FW: Lynx SSA letter sent to Oregon Department of Fish and Wildlife

Hi Ron,

In July we sent the attached letter to Director Melcher regarding coordination with state wildlife agencies on the species status assessment for the Canada Lynx. We have been holding monthly calls with State agencies to provide updates on the progress of the status assessment and to obtain input from the states throughout the process. I was asked by our regional representative on the lynx core team if there were others in ODFW that we should also keep in the loop (e.g. regular email updates on the process, reminders about the coordination calls, etc). If there is someone besides your director that should be on that list, please let me know and I will forward that on.

Thanks Ron.

Sue

From: Sue Livingston [mailto:sue_livingston@fws.gov]

Sent: Thursday, July 16, 2015 10:47 AM

To: 'jmawdsley@fishwildlife.org'; 'Nick.Wiley@myfwc.com'; Gary Frazer; Gary Miller; Bryon Holt; Jim Zelenak

Subject: Lynx SSA letter sent to Oregon Department of Fish and Wildlife

Hello,

Please find attached the letter that was sent to Director Melcher of the Oregon Department of Fish and Wildlife inviting their participation in the lynx SSA process.

Regards,

Sue

~~~~~  
Sue Livingston

Fish and Wildlife Biologist

U.S. Fish and Wildlife Service

Oregon Fish and Wildlife Office

2600 SE 98th Ave., Suite 100

Portland, OR 97266  
503-231-6179  
FAX 503-231-6195  
<http://www.fws.gov/oregonfwo/>

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\*\*\*\*\*

Bryon Holt  
U.S. Fish and Wildlife Service  
Northern Idaho Field Office, Spokane, WA  
Telephone: (509) 893-8014  
Fax: (509) 891-6748  
email: [bryon\\_holt@fws.gov](mailto:bryon_holt@fws.gov)

\*\*\*\*\*

**From:** Belleman, Ann  
**To:** [Hanvey, Gary -FS](#)  
**Subject:** Re: Quick question re: USFS incorporation of MBTA and E.O. 13186  
**Date:** Friday, October 23, 2015 2:38:52 PM  
**Attachments:** [image004.png](#)  
[image002.png](#)  
[image001.png](#)  
[image003.png](#)

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Yes, of course - will delete. Read through it quickly - some heady and important issues.

Thanks for the info/update. Sorry to hear you're still in limbo-land. What a pain. Would be nice if you could move before winter sets in.

Not much new here. If you talk to John, ask him about the lynx SSA and what his thoughts were. I'll hear a little more about it on Monday from the Superior NF Forest Bio who attended, although it'll be general. She did mention that the climate change info was a little startling. The Midwest FWS rep only said that it went okay despite getting off track at one point and having to re-group, whatever that meant.

Good luck with your presentation and keep me posted.

Ann Belleman  
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[ann\\_belleman@fws.gov](mailto:ann_belleman@fws.gov)

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(612) 725-3548 (Bloomington, MN)

On Fri, Oct 23, 2015 at 2:56 PM, Hanvey, Gary -FS <[ghanvey@fs.fed.us](mailto:ghanvey@fs.fed.us)> wrote:

Hummm..... I thought the MOU included several Regions and maybe all Regions w/in the FS. You might want to touch base w/ Don Delong. He wrote the MB effects section for the UG EIS. His analysis was very in depth, but he really didn't follow guidance provided by the MOU or EO, and the RO jumped him about it. Forest and Region didn't like his analysis because he determined adverse effects that didn't support the grazing alternatives. So, he dug into specifics of the MOU. Give him a call.... He'd probably appreciate your advice/opinion on his analysis approach.

On the RO clock now (since Oct 4), but still not moved to Missoula. I have a desk here in the RO and a desk on the Flathead still. HR just finished the cost analysis and sent it the Regional Forester for action – their assessment says its best to pay my expenses for a year (@\$31K) vs move me to and from Kalispell (@\$54K). It's a BS analysis because I'm not going back to the Flathead and I likely will be in this position for longer than a year. Eric and I just talked. He's going to visit with the

RF and they will figure it out. In the meantime, I'm still in limbo-land.

Have meeting in a few to brief the RF and RO Staff on Regional Lynx issues – several Forests will be plugged in VTC. Been preparing all week. See agenda and topic table attached – please don't share w/ anyone – its in-house stuff. In fact, you should delete it after reading. I trust you'll do that.



**Gary Hanvey**  
**Wildlife Biologist**

**Canada Lynx Coordinator**  
**Forest Service**

**Northern Region**

**p: 406-329-3108**  
**c: 406-781-1765**  
[ghanvey@fs.fed.us](mailto:ghanvey@fs.fed.us)

Fort Missoula, Bldg 26  
Missoula, MT 59804  
[www.fs.fed.us](http://www.fs.fed.us)



**Caring for the land and serving people**

**From:** Belleman, Ann [mailto:[ann\\_belleman@fws.gov](mailto:ann_belleman@fws.gov)]  
**Sent:** Friday, October 23, 2015 9:45 AM  
**To:** Hanvey, Gary -FS  
**Subject:** Quick question re: USFS incorporation of MBTA and E.O. 13186

Hi Gary,

Are you located in Missoula yet? Hopefully you've got the new job admin-related stuff ironed out by now.

Do you remember if the above was part of a R4 RO MOU or directive or something like that? Seems the BTNF bios discussed at least MBTA occasionally and I was wondering where that came from.

In WY, FWS focused on MBTA much more so than the Twin Cities FO that I now work under. In reading through E.O. 13186, it mentions MOUs between fed agencies and FWS, so thought maybe the BTNF and/or R4 RO had one.

Just trying to gather some background info.

Ann Belleman

U.S. Fish and Wildlife Service

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4101 American Blvd. E

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[ann\\_belleman@fws.gov](mailto:ann_belleman@fws.gov)

(307) 421-5839 (work cell)

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**From:** [Parkin, Mary](#)  
**To:** [Cummings, Jonathan](#)  
**Cc:** [Bell, Heather](#); [Zelenak, Jim](#); [Shoemaker, Justin](#); [Mark McCollough](#); [Tamara Smith](#); [Kurt Broderdorp](#); [Bryon Holt](#); [Jodi Bush](#); [Seth Willey](#)  
**Subject:** Re: Lynx meeting notes  
**Date:** Monday, October 26, 2015 5:48:59 AM

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Thanks very much, Jonathan. I realize I didn't send you the photos of the flip charts last week (too busy vacationing!), so today I'll do two things: send them along to you from my phone, and look at them while I'm checking your notes.

Cheers,  
Mary

On Fri, Oct 23, 2015 at 4:43 PM, Cummings, Jonathan <[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)> wrote:

I've scrolled through the notes, and added what little I had note wise. My note file is in the google workshop notes drive if anyone wants to compare, otherwise it can probably be deleted.

I've started adding my elicitation sections to the notes. I added an introduction to that section that you should review. See my comment on that section about my effort to word this appropriately. I tried to capture what was done, the feelings on scoring, and the methodology. Revise as needed and to match how you would like to handle the responses.

Also, have the graphs been scanned. If I'm including those I'll need to view them.

On Thu, Oct 22, 2015 at 4:16 PM, Bell, Heather <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)> wrote:  
whatever you want! suggestion mode is good if we can tell who's is who's!

Heather Bell  
Ecological Services HQ  
Branch of Conservation Integration  
SSA Framework Team Lead  
Remotely Located at  
134 S. Union Blvd  
Lakewood, CO 80228  
303-236-4514

Check it out! SSA Framework - Google Site for Staff  
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google  
Site: <https://sites.google.com/a/fws.gov/rev/>

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Core Team: If you have additions to the notes, please add them in editing mode, as Heather recommended. Insert comments if you have questions on any of the compiled notes or if you feel additional follow-up with experts may be necessary.

Thanks,

Jim

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Great. Can you notify the group?

Justin Shoemaker  
Senior Listing Biologist  
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Email: [justin\\_shoemaker@fws.gov](mailto:justin_shoemaker@fws.gov)

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Thanks Justin.

Heather created a "Workshop notes" folder within the "Workshop Materials" folder:

<https://drive.google.com/drive/folders/0BxeUAgASF6g0bXhlM0ZvU2tmZ2M>

I can drop this in there and then open it so we all can work on the google doc version.

On Thu, Oct 22, 2015 at 9:45 AM, Shoemaker, Justin  
<[justin\\_shoemaker@fws.gov](mailto:justin_shoemaker@fws.gov)> wrote:

Jim,

Here are the notes. Do we have a google drive folder set up yet? I wasn't sure if I should start one or what.

Justin Shoemaker  
Senior Listing Biologist  
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Phone: 309-757-5800 ext. 214  
Email: [justin\\_shoemaker@fws.gov](mailto:justin_shoemaker@fws.gov)

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*Mary Parkin*

*Endangered Species Recovery Coordinator, Northeast Region*

*U.S. Fish and Wildlife Service, Hadley, MA*

*Remotely located in Escalante, Utah:*

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*Street address 145 North Center St, Escalante, UT 84726*

*Phone 617-417-3331*

*Email [mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)*

**From:** [Parkin, Mary](#)  
**To:** [Cummings, Jonathan](#)  
**Cc:** [Bell, Heather](#); [Zelenak, Jim](#); [Shoemaker, Justin](#); [Mark McCollough](#); [Tamara Smith](#); [Kurt Broderdorp](#); [Bryon Holt](#); [Jodi Bush](#); [Seth Willey](#)  
**Subject:** Re: Lynx meeting notes  
**Date:** Monday, October 26, 2015 7:48:59 AM

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Thanks very much, Jonathan. I realize I didn't send you the photos of the flip charts last week (too busy vacationing!), so today I'll do two things: send them along to you from my phone, and look at them while I'm checking your notes.

Cheers,  
Mary

On Fri, Oct 23, 2015 at 4:43 PM, Cummings, Jonathan <[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)> wrote:

I've scrolled through the notes, and added what little I had note wise. My note file is in the google workshop notes drive if anyone wants to compare, otherwise it can probably be deleted.

I've started adding my elicitation sections to the notes. I added an introduction to that section that you should review. See my comment on that section about my effort to word this appropriately. I tried to capture what was done, the feelings on scoring, and the methodology. Revise as needed and to match how you would like to handle the responses.

Also, have the graphs been scanned. If I'm including those I'll need to view them.

On Thu, Oct 22, 2015 at 4:16 PM, Bell, Heather <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)> wrote:  
whatever you want! suggestion mode is good if we can tell who's is who's!

Heather Bell  
Ecological Services HQ  
Branch of Conservation Integration  
SSA Framework Team Lead  
Remotely Located at  
134 S. Union Blvd  
Lakewood, CO 80228  
303-236-4514

Check it out! SSA Framework - Google Site for Staff  
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google  
Site: <https://sites.google.com/a/fws.gov/rev/>

On Thu, Oct 22, 2015 at 11:30 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:  
Heather suggested edit mode, though it may be nice to be able to "track changes."

On Thu, Oct 22, 2015 at 11:24 AM, Cummings, Jonathan <[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)> wrote:

Do you mean for us to add any of our notes in suggestion mode (similar to track changes) or edit mode (which directly makes the edits)?

On Thu, Oct 22, 2015 at 1:18 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:  
Will do (am doing).

Core Team: If you have additions to the notes, please add them in editing mode, as Heather recommended. Insert comments if you have questions on any of the compiled notes or if you feel additional follow-up with experts may be necessary.

Thanks,

Jim

On Thu, Oct 22, 2015 at 10:49 AM, Shoemaker, Justin  
<[justin\\_shoemaker@fws.gov](mailto:justin_shoemaker@fws.gov)> wrote:

Great. Can you notify the group?

Justin Shoemaker  
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Email: [justin\\_shoemaker@fws.gov](mailto:justin_shoemaker@fws.gov)

On Thu, Oct 22, 2015 at 11:13 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Thanks Justin.

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*Email [mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)*

**From:** [McCollough, Mark](#)  
**To:** [Jim Zelenak](#)  
**Subject:** Help needed accessing Google Docs  
**Date:** Tuesday, October 27, 2015 9:13:26 AM

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Jim:

I am trying to get to the minutes to edit today, but am having problems.

1) Using your Oct 22 email, I can get to a word doc of Justin's minutes, then I open in google docs, but I see no one else's comments. Nor do I see how to edit it "edit mode."

2) I try to get to Heather's folder, but cannot open the file. I get a message that the folder does not exist or I do not have permission to access it.

Sorry, but I am at the bottom of the learning curve on google docs.

Maybe we could go over on the call today?

Mark

--

Mark McCollough, Ph.D.  
Endangered Species Specialist  
Maine Field Office  
U. S. Fish and Wildlife Service  
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Phone 207 866-3344 x115  
Cell Phone: 207 944-5709  
[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)

**From:** [McCollough, Mark](#)  
**To:** [Jim Zelenak](#)  
**Subject:** Help needed accessing Google Docs  
**Date:** Tuesday, October 27, 2015 11:13:23 AM

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Jim:

I am trying to get to the minutes to edit today, but am having problems.

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[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)

**From:** [Cummings, Jonathan](#)  
**To:** [Jim Zelenak](#); [Justin Shoemaker](#); [Seth Willey](#); [Jodi Bush](#)  
**Cc:** [Kurt Broderdorp](#); [Tamara Smith](#); [Mark McCollough](#); [Bryon Holt](#); [Heather Bell](#); [Mary Parkin](#)  
**Subject:** Meeting Notes Question Numbers  
**Date:** Tuesday, October 27, 2015 11:48:07 AM

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Just sending heads up that I changed the question number in the notes to go in a more logical order and not skip over anything. So, for example, there isn't a question 7 anymore. Sorry if this makes adding your notes more difficult, but I thought this would be better for a reader.

--

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STATE OF MAINE  
DEPARTMENT OF INLAND FISHERIES & WILDLIFE

284 STATE STREET  
AUGUSTA ME 04333

CHANDLER E. WOODCOCK  
COMMISSIONER

September 24, 2015

Dr. Paul R. Phifer  
Assistant Regional Director,  
Ecological Services  
U.S. Fish and Wildlife Service  
300 Westgate Center Drive  
Hadley, MA 01035-9587

Dear Dr. Phifer:

The following letter originally sent on August 24, 2015 describes the proposed minor amendments that the Maine Department of Inland Fisheries and Wildlife would like to make to the "Incidental Take Plan for Maine's Trapping Program" associated with Incidental Take Permit (TE48539B-0) that was issued to the Department last November. After consultation with the US Fish and Wildlife Service the Department would like submit this amended letter and accompanying documentation to address the Service's request for clarification on a number of points. The letter includes a description of the events that led up to our amendment request, the proposed amendments, and a list of changes we made to our Incidental Take Plan (Plan). I've enclosed an updated version of our Plan dated September 24, 2015 to reflect this revision. Please note that we used a redline format to denote changes to our original Plan. Please contact me if you or your staff would like clarification on any of the points raised in this letter or in the revised Plan.

Following submission of the Maine Department of Inland Fisheries and Wildlife's (IFW) Plan, an Incidental Take Permit (ITP) was issued to IFW by the U.S. Fish and Wildlife Service (USFWS) in November 2014. Under the original Plan, IFW made significant changes to the state's furbearer management program to protect lynx while still allowing the lawful activity of trapping. One such method was permitting the use of killer-type traps set on leaning poles at least four feet above ground or snow level. IFW's data demonstrated that no lynx had been captured in over 750,000 trap nights, thus supporting IFW's conclusion that lynx would be protected by Maine's leaning pole regulations. The Plan included "Changed Circumstances" provisions in the event that the leaning pole regulations proved to not be adequately protective of lynx. During the 2014-2015 trapping season two lynx were lethally taken in killer-type traps set on leaning poles for fisher and marten. In accordance with the Changed Circumstances provisions, IFW immediately implemented regulatory measures to prevent

further lynx fatalities (Section 5.4 Change Circumstance #3, Plan) during the remaining portion of the 2014-2015 trapping season.

For the upcoming 2015-2016 trapping season, IFW began investigating new methods and devices that would provide increased protection of lynx while still allowing trapping. From these efforts, IFW identified three changes that we would like to make to our trapping regulations to protect lynx from additional incidental take. These proposed changes qualify as minor amendments (Plan, Section 8.2, p. 146), because their implementation would have either a neutral or beneficial impact on lynx, and because they are not significantly different from measures already described in the Plan. Furthermore, these measures do not impact the lynx population or their habitat. Specifically, the proposed changes align closely with the minor amendment example provided in the Plan “Add conservation or management measures to our mitigation plan to enhance its effectiveness,” (Section 8.2, p. 147).

We identify three minor amendments. The first amendment is designed to prevent additional lethal take of lynx in killer-type traps set on land. The other amendments were designed, out of an abundance of caution, to further reduce the risk of significant injury to lynx captured in foothold traps. However, these amendments may result in reduced efficacy of furbearer trapping. Over the permit period, IFW will continue to investigate alternative trapping methods and exclusion device designs to protect lynx while allowing for more effective trapping of furbearers, including fisher, marten, and raccoon. If more effective methods are identified, IFW may seek future minor amendments to our ITP. The three proposed minor amendments are described below, and upon approval, will be implemented beginning October 2015.

**Proposed Amendment 1:** Eliminating the use of leaning pole sets as described in Rule 09-137 Chapter 4.01K, and requiring the use of exclusion devices statewide when using a killing-type trap except as described in Section 3 Table 3, Regulation/Action 7 D 1-3, in IFW’s Plan.

During the 2014-2015 trapping season, two lynx were killed in legally set killer-type traps on leaning pole sets. Therefore, IFW is promulgating regulatory changes to ensure no additional lynx are killed. By committing to the use of exclusion devices in lynx zones for all killer-type traps (except those described in Section 3 Table 3, Regulation/Action 7 D 1-3, in IFW’s Plan) IFW will eliminate the risk to lynx posed by killer-type traps set on leaning pole sets. Although there are no additional data that indicate lynx are residing outside of the lynx zones, IFW, out of an abundance of caution, is requiring that exclusion devices be used statewide.<sup>1</sup> If there are no data that indicate the presence of resident lynx outside of the lynx zone, IFW may eliminate the exclusion device requirement outside of the lynx zone.

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<sup>1</sup> The regulation implementing these requirements differs slightly from the proposed regulation commented upon by USFWS on July 6, 2015. The proposed regulation summarized the three designs of exclusion devices whereas the implemented regulation specifies the design details for each of the three devices. The additional details were included in order to provide better clarity to the regulatory requirements.

Additionally, outside of the lynx zone, IFW may adopt other measures, in lieu of exclusion devices, to assess the effectiveness of such measures in improving the capture of targeted furbearers. Risk to lynx outside of the lynx zone is negligible. Any future regulatory changes within lynx zone that relate to lynx incidental capture will require a consultation with USFWS and possible permit amendment. This amendment would alter IFW's obligation related to trap compliance checks as outlined in the Plan. Under the current Plan, IFW is committed to sampling a minimum of 80 trappers setting killer-type traps in the lynx zone to address concerns expressed by the USFWS (personal communication, June 18, 2012 meeting between USFWS and IFW) regarding trapper compliance with regulations on the use of leaning pole sets for killer-type traps. With the elimination of leaning pole sets, IFW will no longer be checking licensed trappers for compliance associated with this type of set. Furthermore, because trapping effort is expected to decline with the requirement of an exclusion device, it is not known how many trappers can be checked for compliance with the new regulations, or if it is feasible to check 80 individual trappers. Compliance monitoring is not directed to foothold traps because they are concealed sets that are completely buried with no visible bait that can't be checked without disturbing them. However, IFW remains committed to having Maine Warden Service as part of their normal activities check 20 percent of active trappers in the lynx WMDs for compliance with all trapping regulations, including the use of exclusion devices. IFW expects that number to be about 40 or one half of the number IFW anticipated checking on for compliance with the regulations governing leaning pole sets. The fur tagging record books used to record harvested fur will be modified prior to the 2015-16 trapping season to gather information from the trapper on whether or not the fur was taken by foot hold traps or killer type traps with exclusion devices. After the first year the targets will be adjusted to reflect the number of active trappers still trapping once the use exclusion devices is mandatory for anyone trapping with killer-type traps. These data will be recorded and reported annually to the USFWS.

This proposed amendment may have a negative impact on IFW's furbearer program by reducing the harvest of fisher, marten, and raccoons. IFW will monitor fisher harvest rates in the lynx zone and use available information on fisher predation rates on lynx to assess any potential changes to lynx mortality rates. In an effort to maintain harvest objectives and provide viable trapping methods for fisher, marten, and raccoons, IFW will continue to evaluate additional designs for exclusion devices. In addition, other killer-type trap sets that protect lynx but also effectively capture fisher, marten, and raccoons will be evaluated.

Amendment 1 will not impact Maine's lynx population, lynx habitat, or the environment. Additionally, it will not increase the level of incidental take beyond that authorized by the ITP.

**Proposed Amendment 2:** Eliminate the use of drags for foothold traps on dry land in WMDs 1-11, 14, 18, and 19, and require that all foothold traps set on dry land in these WMDs be staked solidly to the

ground. The catch circle<sup>2</sup> for these traps must be cleared of all woody vegetation greater than ½ inch that is rooted to the ground, manmade materials, or other debris that may cause entanglement.

IFW does not have any new information indicating that drags used in conjunction with foothold traps pose more risk than staked traps. However, because two trapped lynx were injured when the trap's drag chain became entangled with vegetation; IFW is prohibiting the use of drags in the lynx zones out of an abundance of caution. By requiring that all traps in WMDs 1-11, 14, 18, and 19 be staked to the ground and catch circles be free of material that could cause entanglement, we will reduce the risk of trap related injuries to lynx caught in foothold traps. The chain length on foothold traps was not restricted, since trappers will likely limit chain length on their own volition. If trappers are now required to clear a catch circle, the size of which is determined, in part, by the length of the chain, it will take more effort to set traps with a long chain than with a short chain.

By eliminating any potential risk posed by drag sets, this amendment will have no effect on Maine's lynx population, lynx habitat, or on the environment. This amendment will not increase the level of take beyond that authorized by the ITP. Amendment 2 will not alter our obligations related to trapper compliance checks. Compliance checks related to Amendment 2 will be conducted during regular Warden Service activities and during calls related to incidental lynx captures.

**Proposed Amendment 3:** Require that foothold traps, set statewide on dryland, have the following components or features: 1) chains mounted within the central portion of the base of the trap; 2) a trap and chain set-up that includes at least three swiveling points: one where the chain is attached to the trap, one mid-length along the chain, and one at the anchoring point. Amendment 3 would alter the current regulation<sup>3</sup> as described in Section 3 Table 3, Regulation 19 (IFW's Plan p. 32).

Although there are no new data that indicate the current regulation of one swivel puts lynx at greater risk of injury, out of an abundance of caution, IFW is requiring that trap chains be mounted to the central portion of the base of the trap and three swiveling points are within the chain set up. The practice of using multiple swiveling points for foothold traps is a Best Management Practice outlined for trapping of furbearers in North America. This is also a common practice when using foothold traps to capture animals for research. This modification to foothold trap setups may further reduce the probability of a lynx being injured in a foothold trap.

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<sup>2</sup> The area circumscribed by the chain and trap when stretched to their fullest extent from the stake and moved 360° around the stake.

<sup>3</sup> The regulation implementing these requirements differs slightly from the proposed regulation commented upon by USFWS on July 6, 2015. The proposed regulation required that the chain be "center mounted" to the base of the trap and have three "swivels." The regulation as adopted requires that the chain be mounted within the "central portion" of the base of the trap and have three "swiveling points." Both of these changes were made in order to provide better clarity to the regulatory requirements.



By further reducing any potential risk of injury to lynx caught in foothold traps, this amendment will have no effect on the lynx population, lynx habitat, or the environment. Amendment 3 will not increase the level of take beyond that authorized by the ITP. Finally, this amendment will not alter our obligations related to trapper compliance checks. Compliance checks related to Amendment 3 will be conducted when animals are observed in foothold traps by wardens and during calls related to incidental lynx captures.

Before the upcoming 2015-2016 trapping season, IFW will use multiple outreach methods to ensure that trappers are aware of the new regulatory changes. In addition to the commitments in the current Plan, a separate instructional video will be produced to provide step-by-step instructions on constructing compliant exclusion devices. This video will be available through IFW's website and be posted on the Maine Trappers' Association website. The Lynx booklet "How to Avoid Incidental Take of Lynx" will be updated to reflect these new regulatory changes and will be provided to the public. The annual Trapper Information Booklet will be mailed, as a hard copy, to all licensed trappers. Within this document, we will inform individuals of the new regulatory changes and provide visual diagrams of the new exclusion devices.

Note: the page numbers referenced below refer to the page numbers in the redline version of IFW's Plan and may not correspond to page numbers in the original Plan (submitted 10/24/14).

### **Title Page**

- Submission date was amended to include proposed minor amendments

### **Executive Summary**

- Page 11, bulleted number one, IFW amended the language to remove leaning pole sets and added the requirement that killer-type traps on land be set in an approved exclusion devices when set in WMD's 1-11, 14, 18, and 19.
- Page 11, bulleted number three, IFW changed the number of swivels from one to three.
- Page 11, following bulleted number 10, IFW added the following paragraph:

"During the 2014-2015 trapping season, two lynx were killed in legally set killer-type traps on leaning pole sets. Therefore, IFW is promulgating regulatory changes to ensure no additional lynx are killed. By committing to the use of exclusion devices in lynx zones for all killer-type traps (except those described in Section 3 Table 3, Regulation/Action 7 D 1-3, PLAN) IFW will eliminate the risk to lynx posed by killer-type traps set on leaning pole sets. The requirement to implement lynx exclusion devices on killer-type traps within lynx WMDs is a condition of the ITP, based on the triggering of changed circumstance number 3. As such, any future change or modification to that commitment requires following the permit amendment process established in chapter 8. However, outside of established lynx WMDs, IFW is not required to implement such devices on killer-type

traps, or can establish the parameters for such requirements based on its sole discretion, since the risk of catching lynx in traps in non-lynx WMDs is extremely low.

### **1.0 Introduction and Background**

- No changes were made

### **2.0 Environmental Setting / Biological Resources**

- No changes were made

### **3.0 Project Description / Activities Covered by Permit**

- In the summary, page 32, IFW has added the following sentence to the end of the first paragraph:

“Throughout this document, we state that no lynx were captured in marten and fisher traps that were lawfully set. During the 2014-15 trapping season that followed this Plan, two lynx were killed in killer-type traps that were lawfully set on leaning poles.”
- In Table 3.0, pages 34-47, IFW has added an additional column to reflect which regulations / actions will remain in place following approval of the requested minor amendments.
- In Table 3.0, page 45, regulation /action number 26 was added to identify that, in WMD’s 1-11, 14, 18, and 19, drags on foothold traps are prohibited and that catch circles must be clear of vegetation and other obstructions
- In Table 3.0, page 46, regulation / action number 27 was added to identify that statewide foothold traps set at or below ground level must have a chain that is mounted within the central portion of the base of the trap with a minimum of three swiveling points.
- In Table 3.0, page 47, regulation / action number 28 was added to identify that killer-type traps must be set in an exclusion device statewide unless the trap is set completely under water; or, for killer type traps with a jaw spread of  $\leq 5$ ” it can be set partially covered by water, under an overhanging stream bank, or used as a blind set.
- Section 3.2, page 60, at the bottom of the first paragraph of the page, IFW added the following sentence:

“During the 2014-15 trapping season that followed this Plan, two lynx were killed in killer-type traps that were lawfully set on leaning poles.”

### **4.0 Potential Biological Impacts / Take assessment**

- Section 4.1, page 72, IFW added the following sentence:

“Despite the original Plan’s minimization measures, two lynx were killed in killer-type traps that were lawfully set on leaning poles during the 2014-15 trapping season, and

thus triggering a changed circumstance under the adaptive management portion of the ITP.”

## 5.0 Conservation Program / Measures to Minimize and Mitigate for Impacts

- Section 5.2, page 88, Table 5.2.2, RC 1, IFW altered the commitment to reflect that exclusion devices will be allowed for killer-type traps whose jaw spread does not exceed 7 ½” except on blind sets not to exceed a 5” jaw spread.
- Section 5.2, page 88, Table 5.2.2, RC4, IFW altered the commitment to reflect that the IFW will require foothold traps to have trap chains mounted to the central portion of the base of the trap with a minimum of three swiveling points, and require staked traps with a catch circle clear of vegetation or other obstructions in WMD’s 1-11, 14, 18, 19.
- Section 5.2, pages 89-90, Table 5.5.2, O&E 7, Trapper Video, IFW will produce a second video showing how to build an exclusion device. PI 4, IFW altered compliance monitoring to reflect that IFW wardens will check 20% (40) of active trappers setting killer-type traps in the lynx range as a part of their routine activities.
- In Section 5.2.1, page 92, RC 1, IFW added the following sentence:

“During the 2014-15 trapping season that followed the October 2014 Plan, two lynx were killed in killer-type traps that were lawfully set on leaning poles. This change resulted in a minor amendment to this Plan in August 2015 that eliminates leaning pole sets without exclusion devices in lynx WMDs.”

- Section 5.2.1, pages 92-93, IFW altered the language of the commitment to reflect that IFW will prohibit the use of killer-type traps on or above the ground without an exclusion device unless set as described in Rule 09-137 Chapter 4.01 K page 29.
- Section 5.2.1, Page 94, Figure 5.2.1, IFW added text to reflect regulatory changes to lynx exclusion devices.
- Section 5.2.1, Page 97, RC 4, IFW altered the commitment to reflect that IFW will require trap chains to be mounted to the central portion of the base of the trap and have three swiveling points, and that foothold traps will be staked and catch circles cleared of vegetation or other obstructions in WMD’s 1-11, 14, 18, 19.
- Section 5.2.1, Page 110-111, O&E 7, IFW describes the second video that will be produced to show how to build an exclusion device.
- Section 5.2.1, page 114, PI 4, IFW added the following sentences to the Rationale and Background:

“However, killer-type traps on or above ground will not be allowed without an exclusion device beginning with the 2015-16 trapping season unless set as described in Appendix 2. Thus compliance monitoring to address the USFWS concern with leaning pole sets is

no longer necessary. However, IFW has agreed to check compliance on use of lynx exclusion devices as part of normal Warden Service activities.”

Section 5.2.1, pages 114-115, PI 4, IFW altered the Commitment language to:

- “During their routine activities, IFW Warden Service will check 20% of active trappers setting killer-type traps for fisher and marten in the lynx range each trapping season during the permit period for compliance with current regulations on exclusion devices<sup>4</sup>. IFW expects the number of trappers setting killer type traps for fisher and marten to decline based on the expense and difficulty in using exclusion devices. Therefore, IFW expects that number of trappers to be checked for compliance to be about one half of the number (40), that IFW anticipated checking on for compliance with the regulations governing leaning pole sets. The fur tagging record books used to record harvested fur will be modified prior to the 2015-16 trapping season to gather information from the trapper on whether or not the fur was taken by foot hold traps or killer type traps with exclusion devices. This information will be used to calibrate whether or not IFW has met the target for compliance monitoring. IFW biologists will analyze these data and use information from compliance monitoring to inform IFW’s contingency plans (Section 5.4).”
- Section 5.2.1, page 115, PI 4, IFW altered the implementation language to reflect that compliance checks for leaning pole sets will no longer be conducted since this is no longer a legal trapping method. Instead, compliance checks will be implemented for exclusion devices.
- Section 5.4, page 142, Changed Circumstance # 5, the trigger was altered to reflect that leaning pole sets are no longer a legal method and exclusion devices are required. Triggers for Changed Circumstance #5 now relate to compliance with the correct configurations of exclusion devices approved for use.

## 6.0 Funding

- No Changes were made

## 7.0 Measures Considered but Not Implemented

- No Changes were made

## 8.0 Future Amendments

- No Changes were made

## Literature Cited

- No Changes were made

---

<sup>4</sup> Study Limitations: There is no way to sample specific trappers without their knowledge. Maine trappers have no legal requirement to disclose the location of their traps or trap lines. Wardens often put more effort on checking past or suspected violators; therefore, the rate of non-compliance may be higher than from a random sample of trappers.



## Appendices

We replaced the previous Appendix 2 with a new Appendix 2 to reflect new regulatory change related to foothold and killer-type trapping statewide.

No changes have been made to other Appendices. For convenience sake, we are not including Appendix 1 and Appendices 3 -13.

Sincerely,

A handwritten signature in blue ink that reads "James M. Connolly". The signature is written in a cursive style with a large initial "J" and a long, sweeping underline.

James M. Connolly  
Director, Bureau of Resource Management

**From:** Connolly, James  
**To:** [Paul\\_Phifer@fws.gov](mailto:Paul_Phifer@fws.gov)  
**Cc:** [Camuso, Judy](#); [Taub, Christopher C](#)  
**Subject:** Revised Amendment Request to provide clarification part 1  
**Date:** Thursday, September 24, 2015 1:20:15 PM  
**Attachments:** [Letter of Request to amend MDIFW ITP JMC to Phifer TE48539B-0 09242015 .pdf](#)

---

Paul, Per our discussion we have revised our amendment request to provide additional clarification in those areas that the Service had requested additional information or clarity. Attached is the Amended Letter of Request. I will be sending the request in three parts attached separately to three emails including: the letter, the plan, Appendix 2 of the plan. All other Appendices were left unchanged and are not being resent. Please let me know when you have received all three pieces. Thanks Jim

James M. Connolly  
Director, Bureau of Resource Management  
Maine Department of Inland Fisheries & Wildlife  
284 State Street  
41 State House Station  
Augusta ME 04333-0041  
(207) 287-5259  
(207) 287-6395 fax

*Correspondence to and from this office is considered a public record and may be subject to a request under the Maine Freedom of Access Act. Information that you wish to keep confidential should not be included in email correspondence.*

**From:** Connolly, James  
**To:** [Paul\\_Phifer@fws.gov](mailto:Paul_Phifer@fws.gov)  
**Cc:** [Camuso, Judy](#); [Taub, Christopher C](#)  
**Subject:** Revised Amendment Request to provide clarification part 2  
**Date:** Thursday, September 24, 2015 1:32:21 PM  
**Attachments:** [Lynx ITP submitted to USFWS on 10\\_28\\_14 with DRAFT minor amendments 09242015.docx](#)

---

Amended ITP, the Plan

James M. Connolly  
Director, Bureau of Resource Management  
Maine Department of Inland Fisheries & Wildlife  
284 State Street  
41 State House Station  
Augusta ME 04333-0041  
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*Correspondence to and from this office is considered a public record and may be subject to a request under the Maine Freedom of Access Act. Information that you wish to keep confidential should not be included in email correspondence.*

**From:** Connolly, James  
**To:** [Paul\\_Phifer@fws.gov](mailto:Paul_Phifer@fws.gov)  
**Cc:** [Camuso, Judy](#); [Taub, Christopher C](#)  
**Subject:** Revised Amendment Request to provide clarification part 3  
**Date:** Thursday, September 24, 2015 1:32:23 PM  
**Attachments:** [Appendix 2.doc](#)

---

Amended Appendix 2

James M. Connolly  
Director, Bureau of Resource Management  
Maine Department of Inland Fisheries & Wildlife  
284 State Street  
41 State House Station  
Augusta ME 04333-0041  
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*Correspondence to and from this office is considered a public record and may be subject to a request under the Maine Freedom of Access Act. Information that you wish to keep confidential should not be included in email correspondence.*

**From:** Camuso, Judy  
**To:** ["Zicari, Laury"](#)  
**Subject:** try this  
**Date:** Tuesday, October 27, 2015 2:00:17 PM  
**Attachments:** [Revised Amendment Request to provide clarification part 3.msg](#)  
[Revised Amendment Request to provide clarification part 2.msg](#)  
[Revised Amendment Request to provide clarification part 1.msg](#)

---

**From:** [Zelenak, Jim](#)  
**To:** [Tamara Smith](#); [Bryon Holt](#); [Kurt Broderdorp](#); [Jonathan Cummings](#)  
**Subject:** Re: Lynx Genomics Proposal  
**Date:** Tuesday, October 27, 2015 2:47:30 PM

---

Actually, after chatting about it with Mark, I've decided not to send the other email string, in which we both noted inaccuracies in the ESA-related parts of the proposal, wondered about why it was not mentioned at the workshop in MN, and speculated about what might be it's main intent (supporting Maine's desire that lynx there be their own DPS).

I will, however, let you know what I hear about it from Mike Schwartz and others in the lynx genetics world, if anything.

On Tue, Oct 27, 2015 at 2:26 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Attached is the lynx genomic study proposal Mark and I discussed on the core team call this morning. I will follow this with some additional discussion about it.

----- Forwarded message -----

**From:** **Zicari, Laury** <[laury\\_zicari@fws.gov](mailto:laury_zicari@fws.gov)>  
**Date:** Wed, Oct 21, 2015 at 9:34 AM  
**Subject:** Fwd: Lynx Genomics Proposal  
**To:** Jim Zelenak <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>  
**Cc:** Mark McCollough <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>

Not sure if they coordinated with you, Jim.

----- Forwarded message -----

**From:** **Jakubas, Walter** <[Walter.Jakubas@maine.gov](mailto:Walter.Jakubas@maine.gov)>  
**Date:** Wed, Oct 21, 2015 at 10:27 AM  
**Subject:** Lynx Genomics Proposal  
**To:** "McCollough, Mark" <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>, Laury Zicari <[laury\\_zicari@fws.gov](mailto:laury_zicari@fws.gov)>  
**Cc:** "Vashon, Jennifer" <[Jennifer.Vashon@maine.gov](mailto:Jennifer.Vashon@maine.gov)>, "Connolly, James" <[James.Connolly@maine.gov](mailto:James.Connolly@maine.gov)>, "Haskell, Shawn" <[Shawn.Haskell@maine.gov](mailto:Shawn.Haskell@maine.gov)>

Mark and Laury,

Talking to Mark yesterday, I realized that he was not aware of a new Lynx Genomics study is just getting underway. Attached is the project statement for the proposal. Principal Investigators include John Organ, USGS; Todd Fuller, University of Massachusetts, Amherst; Steve DeStefano, Massachusetts Cooperative Fish and Wildlife Research Unit at UMass Amherst; Tanya Lama, Ph.D. student at the Mass Coop Unit/UMass Amherst; and Warren Johnson, Smithsonian Institution. Jen will help advise Tanya. Michael Hofreiter, Potsdam University, Brandenburg, Germany, and some of his colleagues that have worked on

Iberian Lynx will also be cooperating on the study.

*Wally*

--

Laury Zicari  
Field Supervisor  
Maine Field Office  
17 Godfrey Drive, Suite 2  
Orono, ME 04473  
207-866-3344 x 1111  
Fax 866-3351  
Cell 207-949-0561

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Kaimy Marks](#)  
**To:** [Richard Rock](#)  
**Cc:** [Sharon Hooley](#); [Austin Richason](#); [Jodi Bush](#)  
**Subject:** Invitational travelers  
**Date:** Tuesday, October 27, 2015 3:43:23 PM  
**Importance:** High

---

Richard-

Thank you for returning my call. I've done as much as I'm able for the invitational traveler vouchers that I've received receipts for. As we discussed, I don't have access to update/change the TID number in the profile tab to make it match the HOST TID number than Austin put in for each of the travelers. Also, I don't have "T-Enter" as an option when signing/stamping the vouchers. **So both items will need to be done for the following vouchers:**

Maletzke, Benjamin

Bowman, Jeffrey (Canadian – he sent banking info separately, not sure what to do with that?)

Siren, Alexej

Cudworth, Nicole

Hodges, Karen – the voucher is created but I'll need your help to get it done correctly, the details are further down in this email.

**Still waiting on receipts from the following:**

Moen, Ron

Kolbe, Jay

Ivan, Jacob

Vashon, Jen

Simons-Legaard

Kaimy

---

**From:** Kaimy Marks [mailto:[kaimy\\_marks@fws.gov](mailto:kaimy_marks@fws.gov)]  
**Sent:** Friday, October 23, 2015 8:27 AM  
**To:** Austin Richason  
**Cc:** Richard Rock; Sharon Hooley  
**Subject:** RE: FW: Travel receipts - CANADIAN invitational traveler  
**Importance:** High

Austin/Richard-

My project leader is asking for a status on these invitational travelers. I've been able to successfully enter vouchers for Ivan, Siren, Cudworth, Maletzke. I started Hodges (Canadian), but asked Richard to complete it and sent him all the receipts. This traveler wants to know when she can expect reimbursement. Can either of you help answer that?

For the others, all are showing "Voucher signed" in Concur – what is the next step? I'm not able to find (might not have permission?) to T-Enter stamp these. How do they get approved and paid? Will any be routed to our PL – Jodi Bush?



Please advise-  
Kaimy

**From:** Richason, Austin [mailto:[austin\\_richason@fws.gov](mailto:austin_richason@fws.gov)]  
**Sent:** Tuesday, October 20, 2015 5:15 PM  
**To:** Kaimy Marks  
**Cc:** Richard Rock  
**Subject:** Re: FW: Travel receipts - CANADIAN invitational traveler

Hello Kaimy,

The airfare will be reimbursed to the traveler since they paid for it so the expense will need to be entered as a reimbursable expense. The per diem is a set rate based on the TDY location so that doesn't need to be changed. It looks like the traveler already did the math on the conversions to USD so just use the amounts given. Richard can help you if you don't know how to edit the expenses. It may also help to go through the simulations [Here](#) to get more familiar with the site functions if you will be assuming duties as travel arranger. And you can find guidance to the most common travel situations and policy [Here](#).

On Tue, Oct 20, 2015 at 10:48 AM, Kaimy Marks <[kaimy\\_marks@fws.gov](mailto:kaimy_marks@fws.gov)> wrote:  
How do I enter/handle the Canadian exchange issue in Concur?  
Also – if you remember, this is the traveler that self-purchased her airline ticket...

---

**From:** Hodges, Karen [mailto:[karen.hodges@ubc.ca](mailto:karen.hodges@ubc.ca)]  
**Sent:** Tuesday, October 20, 2015 9:36 AM  
**To:** Marks, Kaimy  
**Subject:** Travel receipts for lynx SSA

Dear Kaimy,

Attached please find receipts.

1) The airfare bill is in Canadian: \$1180.82 (airfare + travel agent fee). It was billed 9/24. According to OANDA, the exchange rate was 0.7524, making the amount due \$888.45 USD.

2) The parking receipt is in Canadian as well, \$58.50 billed 10/16. Exchange 0.7753 for a total of \$45.36 USD

3) Hotel bill: the bill shows \$694.86, but that includes two food bills (41.10 and 13.80). Lodging alone is \$639.96

888.45+ 45.36+ 639.96 subtotals to \$1565.77 USD

I do not know how you allocate per diems: I was travelling from BC-MN on 10/12 and 10/16, then had 3 days in MN. Breakfasts at the hotel were covered as part of the lodging deal.

Grand total = 1565.77 + per diems. . .

Please also let me know what you need by way of banking information (or if a check can be issued),

or if you need any other information from me.

Many thanks for all your help!  
Karen

Dr. Karen E. Hodges  
Associate Professor, Biology  
University of British Columbia Okanagan  
Science Building, 1177 Research Road  
Kelowna BC V1V 1V7

<http://biol.ok.ubc.ca/faculty/hodges.html>

**From:** Marks, Kaimy [[mailto:kaimy\\_marks@fws.gov](mailto:kaimy_marks@fws.gov)]  
**Sent:** October-19-15 4:01 PM  
**To:** Hodges, Karen  
**Subject:** Re: submitting travel receipts for lynx SSA

Hi Karen,

Scanned copies of all receipts will work. I'll look back at the email from our regional office to see what type of banking information we'll need and get back to you. Thanks!

Kaimy Marks  
Administrative Support Assistant  
MT Ecological Services Office  
Helena, MT  
406-449-5225 X207

On Mon, Oct 19, 2015 at 8:54 AM, Hodges, Karen <[karen.hodges@ubc.ca](mailto:karen.hodges@ubc.ca)> wrote:

Dear Kaimy,

Now that I am back from the lynx meeting, I am wondering about how to claim my travel expenses. Do you need hard copy of the receipts? or could I forward email copies / scans? Do you need banking information?

I have 4 things to claim:

- airfare
- airport parking
- hotel
- whatever your per diem allowances are (2 travel days, 3 days at conference)

Thanks—

Karen

Dr. Karen E. Hodges  
Associate Professor, Biology  
University of British Columbia Okanagan  
Science Building, 1177 Research Road  
Kelowna BC V1V 1V7

<http://biol.ok.ubc.ca/faculty/hodges.html>

--

Regards,

Austin Richason  
USFWS R6/Budget & Finance  
303-236-4453  
FAX 303-236-6958  
[austin\\_richason@fws.gov](mailto:austin_richason@fws.gov)

**Forms & Guidance can be found at our B&F Sharepoint site.**

**\*For Charge Card [CLICK HERE](#)**

**\*For Concur Travel [CLICK HERE](#)**

**\*For Other B&F Functions [CLICK HERE](#)**

**From:** Zicari, Laury  
**To:** [McCollough, Mark](mailto:McCollough.Mark)  
**Subject:** Re: Lynx Genomics Proposal  
**Date:** Wednesday, October 28, 2015 8:09:27 AM

---

perfectly done

On Wed, Oct 28, 2015 at 9:53 AM, McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)> wrote:  
Wally:

Thank you for sharing this project description concerning the lynx genomics study at UMass Amherst. We were not aware of the study.

Lynx genetics were a major subject of our lynx expert elicitation meeting recently in Minnesota. Mike Schwartz provided an overview of all published studies and Jeff Bowman discussed the lynx genetics work from their lab, especially concerning genetics in eastern Canada. In general, the value of conserving the genetic variability in the southern populations was recognized. Although the studies showed genetic structure in the North American population, the differences between populations/regions was relatively low (notwithstanding island populations on Newfoundland and Cape Breton). This seemed intuitive given few barriers to movement and propensity for lynx to disperse long distances. The UMass study was not mentioned at the meeting.

We shared the project description with Jim Zelenak, our national lynx lead in Helena, MT. Given the importance of this issue to our work on the species status assessment, Jim is providing the project description to other genetic labs with expertise with lynx (Mike Schwartz, Dennis Murray, Jeff Bowman). Likely you have already been in touch with these experts. Hopefully, this will result in wider knowledge of your work and cooperation.

Thanks again for making us aware of this study.

Mark McCollough

On Wed, Oct 21, 2015 at 10:27 AM, Jakubas, Walter <[Walter.Jakubas@maine.gov](mailto:Walter.Jakubas@maine.gov)> wrote:

[Mark and Laury,](#)

[Talking to Mark yesterday, I realized that he was not aware of a new Lynx Genomics study is just getting underway. Attached is the project statement for the proposal. Principal Investigators include John Organ, USGS; Todd Fuller, University of Massachusetts, Amherst; Steve DeStefano, Massachusetts Cooperative Fish and Wildlife Research Unit at UMass Amherst; Tanya Lama, Ph.D. student at the Mass Coop Unit/UMass Amherst; and Warren Johnson, Smithsonian Institution. Jen will help advise Tanya. Michael Hofreiter, Potsdam University, Brandenburg, Germany, and some of his colleagues that have worked on Iberian Lynx will also be cooperating on the study.](#)

*Wally*

--

Mark McCollough, Ph.D.  
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207-866-3344 x 1111  
Fax 866-3351  
Cell 207-949-0561

**From:** [Zelenak, Jim](#)  
**To:** [Mark McCollough](#); [Tamara Smith](#); [Kurt Broderdorp](#); [Bryon Holt](#); [Mary Parkin](#); [Heather Bell](#); [Jonathan Cummings](#); [Seth Willey](#); [Jodi Bush](#); [Justin Shoemaker](#)  
**Subject:** Lynx expert graphs  
**Date:** Wednesday, October 28, 2015 9:03:01 AM

---

I scanned the graphs from the workshop and uploaded them to the Lynx SSA google drive under workshop materials.

I also will enter them into an Excel spreadsheet so that we can play around with them a little more. I'll upload that when finished, too.

--

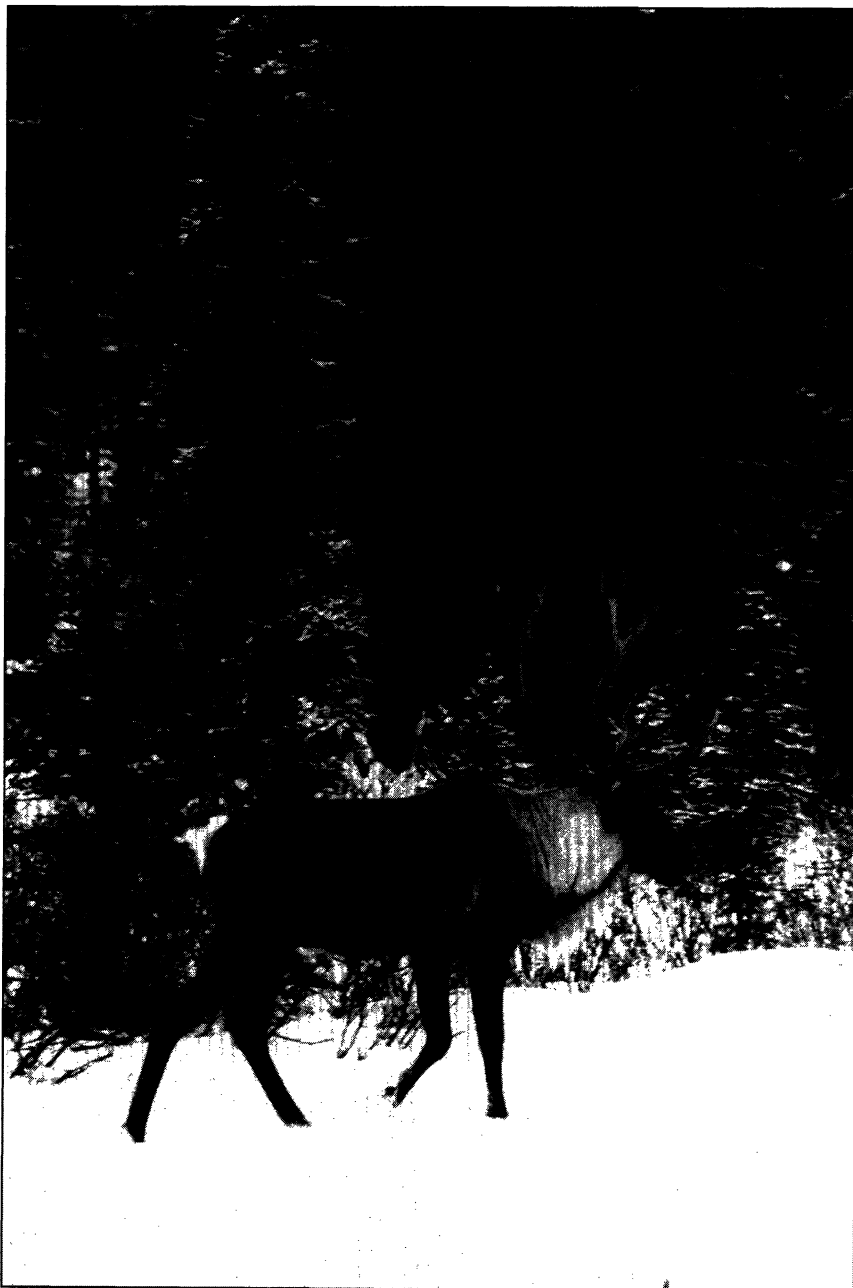
Jim Zelenak, Biologist  
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Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

# Endangered Species UPDATE

*Including a Reprint of the latest USFWS  
Endangered Species Technical Bulletin*

October/November 1995  
Vol. 12 Nos. 10 & 11

School of Natural Resources and Environment  
THE UNIVERSITY OF MICHIGAN



## ***In this Issue***

Woodland Caribou:  
A Conservation  
Dilemma

Prototyping for  
Successful Conservation

ESA Reauthorization  
Battles Continue

Protecting Coastal  
Ecosystems

Hope for Recovery of  
Coastal Plovers

# Woodland Caribou: A Conservation Dilemma

Peter Zager, L. Scott Mills, Wayne Wakkinen, and David Tallmon

At the time of European settlement of North America, caribou (*Rangifer tarandus*) were found over most of Canada and Alaska. Woodland caribou (*R. t. caribou*) extended south to 42° N, and were found in parts of New England, New York, the Upper Great Lakes states, Montana, Idaho, and Washington. By the 1970s, woodland caribou had been eliminated from the eastern United States and most of eastern Canada, extending only to approximately 48° N (Bergerud 1978). The decline extended to the west as well, and by 1980 only 25-30 animals persisted in north Idaho and northeast Washington; caribou had been extirpated elsewhere in the contiguous 48 states. This population was listed as endangered in 1984 under the Endangered

Species Act (ESA). At that time, the entire woodland caribou population in the Selkirks consisted of one herd of 20-25 animals that occurred in extreme northeast Washington, northern Idaho, and the Stagleap Park area of British Columbia (B.C.). The decline in woodland caribou was attributed to various factors including:

- Hunting (legal and illegal),
- Increased mortality related to highway vehicle collisions,
- Habitat modification by fire and logging (USFWS 1985).

To address woodland caribou recovery, an interagency recovery plan was developed (USFWS 1985). The plan addressed the factors in caribou decline by calling for:

1. Controlling poaching,
2. Minimizing caribou deaths

due to collisions with vehicles,

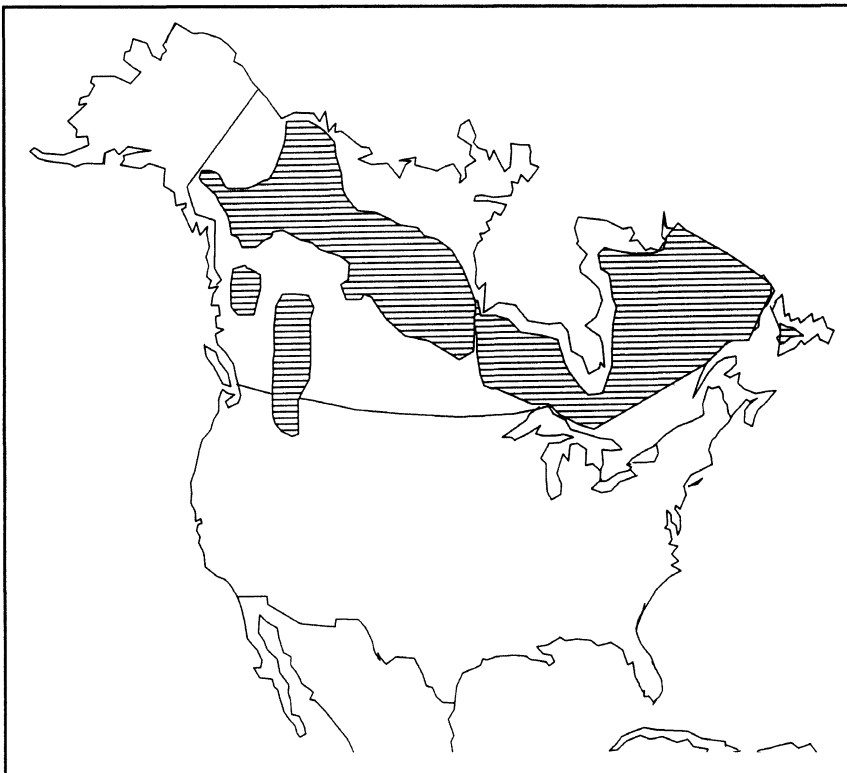
3. Improving habitat quality by closing roads and allowing natural succession, and
4. Augmenting the existing Stagleap population and/or establishing a second population outside the Selkirks (USFWS 1985).

Items 1 and 2 were easily addressed, as were certain aspects of Item 3, but population augmentation was more controversial and complex. Therefore, an augmentation plan was developed and approved (Summerfield 1985a, 1985b). A total of 60 animals were transplanted from British Columbia to the Selkirk Mountains of Idaho. Twenty-four animals were released in 1987, 24 in 1988, and 12 in 1990. The release site was south of the existing resident herd. The intent was to establish a second herd in the Selkirks, thereby reducing the chances of extirpation by way of some catastrophic event eliminating the lone resident herd.

All translocated animals were fitted with mortality-sensing radio collars so they could be monitored systematically. As a result, we obtained good data relative to habitat use, movements, and causes and rates of mortality for caribou in the Selkirks. A winter helicopter census was also developed that allows us to track population size and distribution throughout the ecosystem.

## Results of Translocation Efforts

Unfortunately, even a cursory look at our data and today's caribou population in the Selkirk Mountains is not encouraging. We began with 25-30 caribou in the Selkirks in the early 1980s and added 60 to the ecosystem with the augmentation, how-



Shaded areas show current extent of caribou range. At the time of European settlement caribou were found further south, into New England, New York, the Upper Great Lakes states, and Washington. Map from FWS Woodland Caribou Recovery Plan.





Translocated caribou fitted with mortality-sensing radio collars have provided good data on caribou habitat use, movement, and mortality rates. Photo courtesy of Idaho Department of Fish and Game.

ever today's population is only about 55 caribou. Furthermore, the herd that was established with the augmentation presently consists of only 13 animals. Clearly the augmentation did not catalyze the desired population response.

In response to this, a revised recovery plan called for establishing a second population via augmentation (USFWS 1993). Arguments for another transplant were similar to the first, including reduction of the chances of extirpation with several herds and the desire to place animals in all "available" habitats. The recovery plan also called for a thorough evaluation of the initial augmentation effort and current population dynamics before moving ahead. To that end, we compiled all relevant data and used them as input for population viability analysis using VORTEX and RAMAS.

The analyses shed some light on long-term, broader scale issues while confirming the obvious. They demonstrated that the population is de-

clining, and more importantly, indicated that the simplest and most expedient way to reverse that trend is to eliminate virtually all known predator-related mortality, which accounted for at least 30% (and more likely 50%) of the total mortality. This poses a serious problem for managers, for as the state of Alaska recently discovered, controlling predator populations is a very sensitive issue.

The analyses also showed that caribou are likely to persist in the southern Selkirks for at least the next 20 years, but because of differential survival and movements, virtually all the animals will be part of the resident herd in B.C. Furthermore, the population is likely to stagnate at 40-50 animals, so the probability of persistence at 100 years is less encouraging.

These results indicate that we are not progressing toward recovery, and additional augmentation efforts are unlikely to change that unless there is a fundamental change in caribou demographic rates, specifically an in-

## Endangered Species UPDATE

A forum for information exchange on endangered species issues

Oct./Nov. 1995 Vol. 12 Nos. 10&11

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Cover: Woodland Caribou (*Rangifer tarandus*). Photograph by Tom Ulrich.

The views expressed in the *Endangered Species UPDATE* may not necessarily reflect those of the US Fish and Wildlife Service or The University of Michigan.

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**Caribou in southern British Columbia and northern Idaho prefer mature and old growth forests, but forests today are generally younger than in the past due to timber harvesting and large wildfires. Photo courtesy of Idaho Department of Fish and Game.**

crease in adult survival. Simply adding more animals may buffer the existing herds against the effects of demographic, environmental, and genetic stochasticity, but is unlikely to speed "recovery." Our modelling analyses and previous experience with augmentation indicate this approach will treat the symptoms but not the fundamental causes of caribou decline.

### **The Underlying Dilemma**

Therein rests the underlying issue—our best efforts to "recover" caribou in the Selkirk Mountains have not worked. It seems that we have at least two options. *The first option is to rethink the spatial scale of conservation efforts* and to redirect our energies and resources where the likelihood of success is higher, such as to the stronger, more viable populations in Canada. It is unlikely that caribou can survive in the Selkirks without habitat and a strong population in adjacent British Columbia. We may be wise to forge a cooperative effort with our Canadian neighbors and develop a plan to more effectively ensure caribou persistence on a larger scale. If Canadian populations are doing well,

then there may be little risk in continuing to supply a "sink" population south of the U.S. border with transplants. On the other hand, if the "source" populations are marginal, we may increase the likelihood of caribou extirpation on an even larger scale by continuing translocations.

In the broader context, Griffith et al. (1989) showed that augmenting a species in peripheral habitat is unlikely to succeed. In addition, Lesica and Allendorf (1995) suggest peripheral populations isolated by recent range contraction are unlikely to be genetically differentiated, and thus are less likely to have a large degree of conservation value.

*Our second option involves rethinking the temporal scale of recovery.* Decision-makers, managers, and the public typically expect recovery programs to demonstrate highly visible, high-profile progress over a relatively short time frame. This is unrealistic because recovery programs are designed to reverse long-term population declines often resulting from decades of habitat loss or degradation. It is unreasonable to expect populations to respond quickly to recovery efforts that do not first consider habi-

tat restoration that may take decades. Simply stopping or mitigating further habitat loss or degradation may not be sufficient.

Woodland caribou habitats in the U.S. have changed considerably over the last 100 years, limiting caribou distribution and population size. Caribou in southern British Columbia and northern Idaho "prefer" mature-to-old-growth forests above 1364 m elevation throughout the year (Scott and Servheen 1985, Simpson et al. 1987, Servheen and Lyon 1989). Timber harvest activities over the last 50 years and large wildfires since the turn of the century have altered the habitat mosaic dramatically and resulted in a younger-age forest. The result is that habitats in north Idaho are less extensive and less suitable for woodland caribou today than they were a few decades ago.

Habitat conditions at lower elevations, below identified caribou habitat, have also changed. Timber harvest is an economically important land use at these elevations and has resulted in extensive seral communities that provide very good habitat for expanding moose (*Alces alces*) and white-tailed deer (*Odocoileus*

*virginianus*) populations. Predator populations, especially mountain lions (*Felis concolor*), have apparently responded to the abundant prey base. Consequently, although caribou are not the primary prey item, predation by mountain lions has become an important mortality factor for caribou in the Selkirk Mountains. Furthermore, woodland caribou are a classic K-selected species in that females do not breed until 2 years of age, rarely produce twins, and often calve every other year. Because of this low reproductive potential, their populations cannot tolerate high mortality.

### Reversing the Trend

To reverse this downward population and habitat trend, we believe it is necessary to embark on a grand experiment including an aggressive, long-term habitat management and restoration program designed to shift the balance from seral communities to mature and old-growth communities. To be effective, this must extend beyond identified caribou habitat to include lower elevation white-tailed deer habitat. We expect that this will also shift the balance from whitetails and their predators to caribou and other species characteristic of mature forest communities.

The most obvious problem is that this will require a commitment of at least 100 years to habitat restoration before we can reasonably expect caribou to thrive in the Selkirks. It is easy to envision another large wildfire during that period that would slow the process considerably. We also question the public and agency commitment to such a long-term project.

There may also be short-term, stop-gap measures that will result in the necessary fundamental change in caribou demographic rates, increasing the likelihood of recovery. Directly reducing white-tailed deer and predator densities may have the desired effect, but not without a significant commitment. Care must also be taken to avoid the "predator control" label that such a program may attract. If such an approach were imple-

mented, it behooves us to conduct it as part of an experiment that will provide data and insights for future recovery activities.

### Broader Questions

This leads to the broader and more significant questions. Does it really matter if there are a few caribou south of an arbitrarily drawn international border? Must "recovery" occur within the 5-10 year framework typical of agency planning documents? We suspect that over the next decade or so, similar discussions will focus on lynx (*Felis lynx*), wolverine (*Gulo gulo*), fisher (*Martes pennanti*), and other species that reach the southern extension of their range near the U.S./Canada border. At the same time, Canadian biologists will likely discuss conservation measures for species such as spotted skunk (*Spilogale* spp.), gray fox (*Urocyon cinereoargenteus*), and eastern cottontail (*Sylvilagus floridanus*); all of which are common in the U.S. but reach the northern extension of their range near the U.S./Canada border. In our view, conservation efforts should be based on the biology of the species applied at much broader spatial and temporal scales than we typically use. This will require increased cooperation between Canadian and U.S. biologists and political bodies.

We do not advocate turning our back on woodland caribou, but rather drawing a realistic "line in the sand," then channeling energy and resources to secure those populations and habitats necessary to ensure their future on a global scale. Political boundaries must not obstruct our vision or thinking, and time frames should be expanded to realistically address many conservation issues. With a broader perspective, conservation efforts will enjoy a much greater likelihood of success.

### Literature Cited

- Bergerud, A.T. 1978. Caribou. Pages 83-101 in *Big game of North America: ecology and management*. J.L. Schmidt and D.L. Gilbert, eds. Stackpole Books, Harrison, PA.
- Griffith, B., J.M. Scott, J.W. Carpenter, and C. Reed. 1989. Translocation as a species conservation tool: status and strategy. *Sci.* 245:477-480.
- Lesica, P., and F.W. Allendorf. 1995. When are peripheral populations valuable for conservation? *Cons. Biol.* 9:753-760.
- Scott, M.D., and G. Servheen. 1985. Caribou ecology. Job Compl. Rep., Proj. No. W-160-R-11. ID Dep. Fish and Game, Boise. 136pp.
- Servheen, G., and L.J. Lyon. 1989. Habitat use by woodland caribou in the Selkirk Mountains. *J. Wildl. Manage.* 53:230-237.
- Simpson, K., G.P. Woods, and K.B. Hebert. 1987. Movements and habitats of caribou in the mountains of southern British Columbia. *B.C. Min. of Environ., Wildl. Bull. No. B-57.*
- Summerfield, R. 1985a. Selkirk Mountains caribou herd augmentation: a cooperative interagency plan. U.S. Dep. Agric., For. Serv., Idaho Panhandle National Forests, Coeur d'Alene.
- \_\_\_\_\_. 1985b. Environmental assessment, Selkirk Mountains caribou herd augmentation. U.S. Dep. Agric., For. Serv., Idaho Panhandle National Forests, Coeur d'Alene.
- U.S. Fish and Wildlife Service. 1985. Selkirk Mountain caribou management plan. U.S. Fish and Wildl. Serv., Portland, OR.
- \_\_\_\_\_. 1993. Recovery plan for woodland caribou in the Selkirk Mountains. Portland, OR.

The authors can be contacted at the following addresses:

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- L. Scott Mills, Wildlife Biology Program, University of Montana, Missoula, MT 59812.
- Wayne Wakkinen, Idaho Department of Fish and Game, HCR 85 Box 323-J, Bonners Ferry, ID 83805.
- David Tallmon, Division of Biological Sciences, University of Montana, Missoula, MT 59812.

**From:** Warren, Chris  
**To:** [Michael Carrier](#); [Dennis Mackey](#); [Scott Grunder](#)  
**Cc:** [Kim Garner](#); [Toni Davidson](#); [Ben Conard](#)  
**Subject:** Mt. Caribou Recovery Planning  
**Date:** Wednesday, October 28, 2015 9:35:50 AM  
**Attachments:** [zageretal95.pdf](#)

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Good Morning,

For your information, I've attached the Zager et al. 1995 paper that we discussed last week. It's relatively short and general, but bores quickly to the key issues we'll eventually need to address. A few additional thoughts to consider are: it's from '95, so we're 20 years down the road; Wayne Wakkinen is the current IDFG representative on the Technical Working Group; and Scott Mills, who conducted the original PVA work, is being considered by the group to conduct an updated PVA.

We had a good working group meeting on Monday and the group is open to: 1) expanding the area considered for conservation planning beyond the southern Selkirks; 2) pursuing a more comprehensive PVA that includes some kind of landscape resistance analysis; 3) refining the historic U.S. range; and 4) conducting a more thorough review and expanding the climate change discussions.

I don't mean to load on too much detail, but I think the attached and above are important considering the general strategies we discussed. Kim and I will keep you apprised of any key turning points in the process as we go. Thanks for the help (and opportunity) to this point.

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11103 East Montgomery Drive  
Spokane, Washington 99206  
Phone: (509) 893-8020

**From:** [McCollough, Mark](#)  
**To:** [Jakubas, Walter](#); [Jen Vashon](#)  
**Cc:** [Laury Zicari](#); [Jim Zelenak](#)  
**Subject:** Re: Lynx Genomics Proposal  
**Date:** Wednesday, October 28, 2015 9:53:28 AM

---

Wally:

Thank you for sharing this project description concerning the lynx genomics study at UMass Amherst. We were not aware of the study.

Lynx genetics were a major subject of our lynx expert elicitation meeting recently in Minnesota. Mike Schwartz provided an overview of all published studies and Jeff Bowman discussed the lynx genetics work from their lab, especially concerning genetics in eastern Canada. In general, the value of conserving the genetic variability in the southern populations was recognized. Although the studies showed genetic structure in the North American population, the differences between populations/regions was relatively low (notwithstanding island populations on Newfoundland and Cape Breton). This seemed intuitive given few barriers to movement and propensity for lynx to disperse long distances. The UMass study was not mentioned at the meeting.

We shared the project description with Jim Zelenak, our national lynx lead in Helena, MT. Given the importance of this issue to our work on the species status assessment, Jim is providing the project description to other genetic labs with expertise with lynx (Mike Schwartz, Dennis Murray, Jeff Bowman). Likely you have already been in touch with these experts. Hopefully, this will result in wider knowledge of your work and cooperation.

Thanks again for making us aware of this study.

Mark McCollough

On Wed, Oct 21, 2015 at 10:27 AM, Jakubas, Walter <[Walter.Jakubas@maine.gov](mailto:Walter.Jakubas@maine.gov)> wrote:

Mark and Laury,

Talking to Mark yesterday, I realized that he was not aware of a new Lynx Genomics study is just getting underway. Attached is the project statement for the proposal. Principal Investigators include John Organ, USGS; Todd Fuller, University of Massachusetts, Amherst; Steve DeStefano, Massachusetts Cooperative Fish and Wildlife Research Unit at UMass Amherst; Tanya Lama, Ph.D. student at the Mass Coop Unit/UMass Amherst; and Warren Johnson, Smithsonian Institution. Jen will help advise Tanya. Michael Hofreiter, Potsdam University, Brandenburg, Germany, and some of his colleagues that have worked on Iberian Lynx will also be cooperating on the study.

Wally

--

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**From:** Zelenak, Jim  
**To:** [Bowman, Jeff \(MNRF\)](#); [Dennis Murray](#)  
**Cc:** [Mark McCollough](#); [Laury Zicari](#); [Jodi Bush](#)  
**Subject:** Fwd: Lynx Genomics Proposal  
**Date:** Wednesday, October 28, 2015 10:21:45 AM  
**Attachments:** [Lynx Genomics Project Statement 10.21.2015.docx](#)

---

Hi Jeff and Dennis,

I was wondering if you both could take a look at the attached lynx genomics project statement, of which we (USFWS) just recently became aware. I'd appreciate your thoughts on the project (it's merits/likelihood that it will result in improvements in our understanding of lynx genetics/genomics) and I'd like to know if the project proponents have been in touch with either of you in terms of cooperation/collaboration. It's unclear in the proposal whether they've done so or not.

I've also forwarded this to Mike Schwartz to get his take. It definitely seems like this project presents an opportunity for, and would benefit from, collaboration with both your lab and with Mike's, as well as with other folks who have lynx genetic samples from the Lower 48 and southern Canada.

I'd appreciate your thoughts on this.

Thanks,

Jim

----- Forwarded message -----

**From:** **Zicari, Laury** <[laury\\_zicari@fws.gov](mailto:laury_zicari@fws.gov)>  
**Date:** Wed, Oct 21, 2015 at 9:34 AM  
**Subject:** Fwd: Lynx Genomics Proposal  
**To:** Jim Zelenak <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>  
**Cc:** Mark McCollough <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>

Not sure if they coordinated with you, Jim.

----- Forwarded message -----

**From:** **Jakubas, Walter** <[Walter.Jakubas@maine.gov](mailto:Walter.Jakubas@maine.gov)>  
**Date:** Wed, Oct 21, 2015 at 10:27 AM  
**Subject:** Lynx Genomics Proposal  
**To:** "McCollough, Mark" <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>, Laury Zicari <[laury\\_zicari@fws.gov](mailto:laury_zicari@fws.gov)>  
**Cc:** "Vashon, Jennifer" <[Jennifer.Vashon@maine.gov](mailto:Jennifer.Vashon@maine.gov)>, "Connolly, James" <[James.Connolly@maine.gov](mailto:James.Connolly@maine.gov)>, "Haskell, Shawn" <[Shawn.Haskell@maine.gov](mailto:Shawn.Haskell@maine.gov)>

Mark and Laury,

Talking to Mark yesterday, I realized that he was not aware of a new Lynx Genomics study is just getting underway. Attached is the project statement for the proposal. Principal Investigators include John Organ,

USGS; Todd Fuller, University of Massachusetts, Amherst; Steve DeStefano, Massachusetts Cooperative Fish and Wildlife Research Unit at UMass Amherst; Tanya Lama, Ph.D. student at the Mass Coop Unit/UMass Amherst; and Warren Johnson, Smithsonian Institution. Jen will help advise Tanya. Michael Hofreiter, Potsdam University, Brandenburg, Germany, and some of his colleagues that have worked on Iberian Lynx will also be cooperating on the study.

*Wally*

--

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)



**From:** [Cummings, Jonathan](#)  
**To:** [Zelenak, Jim](#)  
**Cc:** [Mark McCollough](#); [Tamara Smith](#); [Kurt Broderdorp](#); [Bryon Holt](#); [Mary Parkin](#); [Heather Bell](#); [Seth Willey](#); [Jodi Bush](#); [Justin Shoemaker](#)  
**Subject:** Re: Lynx expert graphs  
**Date:** Wednesday, October 28, 2015 10:24:30 AM

---

I can see them now, thanks.

On Wed, Oct 28, 2015 at 11:22 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

The drive is telling me I shared it with you and 11 others...

Workshop Materials ---> Expert Persistence Graphs ---> Expert Graphs - the last folder should have 6 sets (PDFs) of ten graphs labeled by pop/unit.

My spreadsheet looked similar but I will use your template. Thanks.

Let me know if you still can't see the graphs.

On Wed, Oct 28, 2015 at 9:13 AM, Cummings, Jonathan <[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)> wrote:

I'm not sure you shared the graphs, at least I don't see them in the folder.

I can rearrange things as needed in the spreadsheet when you're done, but if you haven't entered them yet can you use the attached as a template for the probabilities? It will make any compilation/graphing easier.

On Wed, Oct 28, 2015 at 11:03 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

I scanned the graphs from the workshop and uploaded them to the Lynx SSA google drive under workshop materials.

I also will enter them into an Excel spreadsheet so that we can play around with them a little more. I'll upload that when finished, too.

--

Jim Zelenak, Biologist  
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**From:** [Zelenak, Jim](#)  
**To:** [Mark McCollough](#); [Tamara Smith](#); [Kurt Broderdorp](#); [Bryon Holt](#); [Mary Parkin](#); [Heather Bell](#); [Jonathan Cummings](#); [Seth Willey](#); [Jodi Bush](#); [Justin Shoemaker](#)  
**Subject:** Lynx expert graphs  
**Date:** Wednesday, October 28, 2015 11:03:04 AM

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I scanned the graphs from the workshop and uploaded them to the Lynx SSA google drive under workshop materials.

I also will enter them into an Excel spreadsheet so that we can play around with them a little more. I'll upload that when finished, too.

--

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Cummings, Jonathan](#)  
**Cc:** [Mark McCollough](#); [Tamara Smith](#); [Kurt Broderdorp](#); [Bryon Holt](#); [Mary Parkin](#); [Heather Bell](#); [Seth Willey](#); [Jodi Bush](#); [Justin Shoemaker](#)  
**Subject:** Re: Lynx expert graphs  
**Date:** Wednesday, October 28, 2015 11:22:40 AM

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The drive is telling me I shared it with you and 11 others...

Workshop Materials ---> Expert Persistence Graphs ---> Expert Graphs - the last folder should have 6 sets (PDFs) of ten graphs labeled by pop/unit.

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**From:** [Zelenak, Jim](#)  
**To:** [Sallabanks, Rex](#)  
**Subject:** Re: lynx ssa call info needed, sorry  
**Date:** Wednesday, October 28, 2015 11:57:38 AM

---

Here you go Rex:

Call-in: 866-822-7385  
Participant passcode: 5396168

On Wed, Oct 28, 2015 at 11:22 AM, Sallabanks, Rex <[rex.sallabanks@idfg.idaho.gov](mailto:rex.sallabanks@idfg.idaho.gov)> wrote:

Jim,

Can you please resend me the conference line information for the call this afternoon.

Thanks, Rex.

-----  
Rex Sallabanks, PhD, CPM  
Wildlife Diversity Program Manager  
Idaho Department of Fish and Game  
-----

208 287 2754 (direct)

208 921 6932 (mobile)

208 334 2920 (office)

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**From:** [Zelenak, Jim](#)  
**To:** [dennis murray](#)  
**Subject:** Re: Lynx Genomics Proposal  
**Date:** Wednesday, October 28, 2015 12:28:08 PM

---

Thanks Dennis.

I may give you a call at some point to discuss this in more detail, once I spend a little more time with the document and talk a little more with our folks in Maine and perhaps with Mike S., too.

Regards,

Jim

On Wed, Oct 28, 2015 at 11:17 AM, dennis murray <[dennismurray@trentu.ca](mailto:dennismurray@trentu.ca)> wrote:

Jim,

In confidence, this sounds more like a glorified landscape genetics study with little evidence that the genomics component will yield anything of substance in the context of what is being proposed or USFWS priorities as I understand them. Surprisingly, this is the first that I hear of this.

Dennis

Dennis Murray

CRC, Integrative Wildlife Conservation,  
Bioinformatics, and Ecological Modeling  
Trent University  
Peterborough, ON  
K9J 7B8

[www.dennismurray.ca](http://www.dennismurray.ca)

On Oct 28, 2015, at 12:21 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Hi Jeff and Dennis,

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I'd appreciate your thoughts on this.

Thanks,

Jim

----- Forwarded message -----

From: **Zicari, Laury** <[laury\\_zicari@fws.gov](mailto:laury_zicari@fws.gov)>  
Date: Wed, Oct 21, 2015 at 9:34 AM  
Subject: Fwd: Lynx Genomics Proposal  
To: Jim Zelenak <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>  
Cc: Mark McCollough <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>

Not sure if they coordinated with you, Jim.

----- Forwarded message -----

From: **Jakubas, Walter** <[Walter.Jakubas@maine.gov](mailto:Walter.Jakubas@maine.gov)>  
Date: Wed, Oct 21, 2015 at 10:27 AM  
Subject: Lynx Genomics Proposal  
To: "McCollough, Mark" <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>, Laury Zicari <[laury\\_zicari@fws.gov](mailto:laury_zicari@fws.gov)>  
Cc: "Vashon, Jennifer" <[Jennifer.Vashon@maine.gov](mailto:Jennifer.Vashon@maine.gov)>, "Connolly, James" <[James.Connolly@maine.gov](mailto:James.Connolly@maine.gov)>, "Haskell, Shawn" <[Shawn.Haskell@maine.gov](mailto:Shawn.Haskell@maine.gov)>

Mark and Laury,

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cooperating on the study.

*Wally*

--

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<Lynx Genomics Project Statement\_10.21.2015.docx>

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Hodges, Karen](#)  
**To:** [Zelenak, Jim](#)  
**Subject:** RE: WA lynx thesis  
**Date:** Wednesday, October 28, 2015 12:47:15 PM

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Hi Jim--

It's a completed thesis: it is to be shared. We are working on its papers, so it does get higher visibility.

Good luck with all the work ahead!  
Karen

Dr. Karen E. Hodges  
Associate Professor  
Department of Biology  
University of British Columbia Okanagan  
Science Building, 1177 Research Road  
Kelowna, BC V1V 1V7

<http://biol.ok.ubc.ca/faculty/hodges.html>

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**From:** Zelenak, Jim [jim\_zelenak@fws.gov]  
**Sent:** October-28-15 8:51 AM  
**To:** Hodges, Karen  
**Subject:** Re: WA lynx thesis

Hi Karen,

Yes - the fun is just starting (and never-ending....). I'm really glad you were able to attend the workshop and present your thoughts and data on hares. I think everyone found your presentation and other contributions helpful. I think we (USFWS) got a lot of what we need, but there's still so much we don't know about lynx populations in the DPS.

Thanks very much for sending Carmen's thesis. Is it OK to share with other Service lynx biologists? What about sharing with the other workshop participants? Let me know.

Thanks again, and it was great to meet you at the workshop.

Jim

On Thu, Oct 22, 2015 at 8:46 AM, Hodges, Karen <[karen.hodges@ubc.ca](mailto:karen.hodges@ubc.ca)> wrote:

Hi Jim--

Having fun yet, sorting through all that expert information? Thank you for asking me to come; I enjoyed that and I do hope FWS got a lot of what was needed from us.

I am attaching my recent MSc student's thesis on the radiocollared WA lynx. The fire chapter is perhaps the most novel / interesting, and we're working it up first for manuscripts.

Cheers,  
Karen

Dr. Karen E. Hodges  
Associate Professor  
Department of Biology  
University of British Columbia Okanagan

Science Building, 1177 Research Road  
Kelowna, BC V1V 1V7

<http://biol.ok.ubc.ca/faculty/hodges.html>

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Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Vashon, Jennifer](#)  
**Cc:** [Jodi Bush](#)  
**Bcc:** [Mark McCollough](#)  
**Subject:** Lynx call  
**Date:** Wednesday, October 28, 2015 1:29:19 PM

---

Hi Jennifer,

Sounded like we lost you on the call just when you were about to let the group know your thoughts about the meeting. If you do have something you'd like to share, email it to me and I will send it around to the group on the phone today.

Hope all is well there.

Jim

--

Jim Zelenak, Biologist  
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STATE OF MAINE  
DEPARTMENT OF INLAND FISHERIES & WILDLIFE

284 STATE STREET  
AUGUSTA ME 04333

CHANDLER E. WOODCOCK  
COMMISSIONER

September 24, 2015

Dr. Paul R. Phifer  
Assistant Regional Director,  
Ecological Services  
U.S. Fish and Wildlife Service  
300 Westgate Center Drive  
Hadley, MA 01035-9587

Dear Dr. Phifer:

The following letter originally sent on August 24, 2015 describes the proposed minor amendments that the Maine Department of Inland Fisheries and Wildlife would like to make to the "Incidental Take Plan for Maine's Trapping Program" associated with Incidental Take Permit (TE48539B-0) that was issued to the Department last November. After consultation with the US Fish and Wildlife Service the Department would like submit this amended letter and accompanying documentation to address the Service's request for clarification on a number of points. The letter includes a description of the events that led up to our amendment request, the proposed amendments, and a list of changes we made to our Incidental Take Plan (Plan). I've enclosed an updated version of our Plan dated September 24, 2015 to reflect this revision. Please note that we used a redline format to denote changes to our original Plan. Please contact me if you or your staff would like clarification on any of the points raised in this letter or in the revised Plan.

Following submission of the Maine Department of Inland Fisheries and Wildlife's (IFW) Plan, an Incidental Take Permit (ITP) was issued to IFW by the U.S. Fish and Wildlife Service (USFWS) in November 2014. Under the original Plan, IFW made significant changes to the state's furbearer management program to protect lynx while still allowing the lawful activity of trapping. One such method was permitting the use of killer-type traps set on leaning poles at least four feet above ground or snow level. IFW's data demonstrated that no lynx had been captured in over 750,000 trap nights, thus supporting IFW's conclusion that lynx would be protected by Maine's leaning pole regulations. The Plan included "Changed Circumstances" provisions in the event that the leaning pole regulations proved to not be adequately protective of lynx. During the 2014-2015 trapping season two lynx were lethally taken in killer-type traps set on leaning poles for fisher and marten. In accordance with the Changed Circumstances provisions, IFW immediately implemented regulatory measures to prevent

further lynx fatalities (Section 5.4 Change Circumstance #3, Plan) during the remaining portion of the 2014-2015 trapping season.

For the upcoming 2015-2016 trapping season, IFW began investigating new methods and devices that would provide increased protection of lynx while still allowing trapping. From these efforts, IFW identified three changes that we would like to make to our trapping regulations to protect lynx from additional incidental take. These proposed changes qualify as minor amendments (Plan, Section 8.2, p. 146), because their implementation would have either a neutral or beneficial impact on lynx, and because they are not significantly different from measures already described in the Plan. Furthermore, these measures do not impact the lynx population or their habitat. Specifically, the proposed changes align closely with the minor amendment example provided in the Plan “Add conservation or management measures to our mitigation plan to enhance its effectiveness,” (Section 8.2, p. 147).

We identify three minor amendments. The first amendment is designed to prevent additional lethal take of lynx in killer-type traps set on land. The other amendments were designed, out of an abundance of caution, to further reduce the risk of significant injury to lynx captured in foothold traps. However, these amendments may result in reduced efficacy of furbearer trapping. Over the permit period, IFW will continue to investigate alternative trapping methods and exclusion device designs to protect lynx while allowing for more effective trapping of furbearers, including fisher, marten, and raccoon. If more effective methods are identified, IFW may seek future minor amendments to our ITP. The three proposed minor amendments are described below, and upon approval, will be implemented beginning October 2015.

**Proposed Amendment 1:** Eliminating the use of leaning pole sets as described in Rule 09-137 Chapter 4.01K, and requiring the use of exclusion devices statewide when using a killing-type trap except as described in Section 3 Table 3, Regulation/Action 7 D 1-3, in IFW’s Plan.

During the 2014-2015 trapping season, two lynx were killed in legally set killer-type traps on leaning pole sets. Therefore, IFW is promulgating regulatory changes to ensure no additional lynx are killed. By committing to the use of exclusion devices in lynx zones for all killer-type traps (except those described in Section 3 Table 3, Regulation/Action 7 D 1-3, in IFW’s Plan) IFW will eliminate the risk to lynx posed by killer-type traps set on leaning pole sets. Although there are no additional data that indicate lynx are residing outside of the lynx zones, IFW, out of an abundance of caution, is requiring that exclusion devices be used statewide.<sup>1</sup> If there are no data that indicate the presence of resident lynx outside of the lynx zone, IFW may eliminate the exclusion device requirement outside of the lynx zone.

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<sup>1</sup> The regulation implementing these requirements differs slightly from the proposed regulation commented upon by USFWS on July 6, 2015. The proposed regulation summarized the three designs of exclusion devices whereas the implemented regulation specifies the design details for each of the three devices. The additional details were included in order to provide better clarity to the regulatory requirements.

Additionally, outside of the lynx zone, IFW may adopt other measures, in lieu of exclusion devices, to assess the effectiveness of such measures in improving the capture of targeted furbearers. Risk to lynx outside of the lynx zone is negligible. Any future regulatory changes within lynx zone that relate to lynx incidental capture will require a consultation with USFWS and possible permit amendment. This amendment would alter IFW's obligation related to trap compliance checks as outlined in the Plan. Under the current Plan, IFW is committed to sampling a minimum of 80 trappers setting killer-type traps in the lynx zone to address concerns expressed by the USFWS (personal communication, June 18, 2012 meeting between USFWS and IFW) regarding trapper compliance with regulations on the use of leaning pole sets for killer-type traps. With the elimination of leaning pole sets, IFW will no longer be checking licensed trappers for compliance associated with this type of set. Furthermore, because trapping effort is expected to decline with the requirement of an exclusion device, it is not known how many trappers can be checked for compliance with the new regulations, or if it is feasible to check 80 individual trappers. Compliance monitoring is not directed to foothold traps because they are concealed sets that are completely buried with no visible bait that can't be checked without disturbing them. However, IFW remains committed to having Maine Warden Service as part of their normal activities check 20 percent of active trappers in the lynx WMDs for compliance with all trapping regulations, including the use of exclusion devices. IFW expects that number to be about 40 or one half of the number IFW anticipated checking on for compliance with the regulations governing leaning pole sets. The fur tagging record books used to record harvested fur will be modified prior to the 2015-16 trapping season to gather information from the trapper on whether or not the fur was taken by foot hold traps or killer type traps with exclusion devices. After the first year the targets will be adjusted to reflect the number of active trappers still trapping once the use exclusion devices is mandatory for anyone trapping with killer-type traps. These data will be recorded and reported annually to the USFWS.

This proposed amendment may have a negative impact on IFW's furbearer program by reducing the harvest of fisher, marten, and raccoons. IFW will monitor fisher harvest rates in the lynx zone and use available information on fisher predation rates on lynx to assess any potential changes to lynx mortality rates. In an effort to maintain harvest objectives and provide viable trapping methods for fisher, marten, and raccoons, IFW will continue to evaluate additional designs for exclusion devices. In addition, other killer-type trap sets that protect lynx but also effectively capture fisher, marten, and raccoons will be evaluated.

Amendment 1 will not impact Maine's lynx population, lynx habitat, or the environment. Additionally, it will not increase the level of incidental take beyond that authorized by the ITP.

**Proposed Amendment 2:** Eliminate the use of drags for foothold traps on dry land in WMDs 1-11, 14, 18, and 19, and require that all foothold traps set on dry land in these WMDs be staked solidly to the



ground. The catch circle<sup>2</sup> for these traps must be cleared of all woody vegetation greater than ½ inch that is rooted to the ground, manmade materials, or other debris that may cause entanglement.

IFW does not have any new information indicating that drags used in conjunction with foothold traps pose more risk than staked traps. However, because two trapped lynx were injured when the trap's drag chain became entangled with vegetation; IFW is prohibiting the use of drags in the lynx zones out of an abundance of caution. By requiring that all traps in WMDs 1-11, 14, 18, and 19 be staked to the ground and catch circles be free of material that could cause entanglement, we will reduce the risk of trap related injuries to lynx caught in foothold traps. The chain length on foothold traps was not restricted, since trappers will likely limit chain length on their own volition. If trappers are now required to clear a catch circle, the size of which is determined, in part, by the length of the chain, it will take more effort to set traps with a long chain than with a short chain.

By eliminating any potential risk posed by drag sets, this amendment will have no effect on Maine's lynx population, lynx habitat, or on the environment. This amendment will not increase the level of take beyond that authorized by the ITP. Amendment 2 will not alter our obligations related to trapper compliance checks. Compliance checks related to Amendment 2 will be conducted during regular Warden Service activities and during calls related to incidental lynx captures.

**Proposed Amendment 3:** Require that foothold traps, set statewide on dryland, have the following components or features: 1) chains mounted within the central portion of the base of the trap; 2) a trap and chain set-up that includes at least three swiveling points: one where the chain is attached to the trap, one mid-length along the chain, and one at the anchoring point. Amendment 3 would alter the current regulation<sup>3</sup> as described in Section 3 Table 3, Regulation 19 (IFW's Plan p. 32).

Although there are no new data that indicate the current regulation of one swivel puts lynx at greater risk of injury, out of an abundance of caution, IFW is requiring that trap chains be mounted to the central portion of the base of the trap and three swiveling points are within the chain set up. The practice of using multiple swiveling points for foothold traps is a Best Management Practice outlined for trapping of furbearers in North America. This is also a common practice when using foothold traps to capture animals for research. This modification to foothold trap setups may further reduce the probability of a lynx being injured in a foothold trap.

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<sup>2</sup> The area circumscribed by the chain and trap when stretched to their fullest extent from the stake and moved 360° around the stake.

<sup>3</sup> The regulation implementing these requirements differs slightly from the proposed regulation commented upon by USFWS on July 6, 2015. The proposed regulation required that the chain be "center mounted" to the base of the trap and have three "swivels." The regulation as adopted requires that the chain be mounted within the "central portion" of the base of the trap and have three "swiveling points." Both of these changes were made in order to provide better clarity to the regulatory requirements.



By further reducing any potential risk of injury to lynx caught in foothold traps, this amendment will have no effect on the lynx population, lynx habitat, or the environment. Amendment 3 will not increase the level of take beyond that authorized by the ITP. Finally, this amendment will not alter our obligations related to trapper compliance checks. Compliance checks related to Amendment 3 will be conducted when animals are observed in foothold traps by wardens and during calls related to incidental lynx captures.

Before the upcoming 2015-2016 trapping season, IFW will use multiple outreach methods to ensure that trappers are aware of the new regulatory changes. In addition to the commitments in the current Plan, a separate instructional video will be produced to provide step-by-step instructions on constructing compliant exclusion devices. This video will be available through IFW's website and be posted on the Maine Trappers' Association website. The Lynx booklet "How to Avoid Incidental Take of Lynx" will be updated to reflect these new regulatory changes and will be provided to the public. The annual Trapper Information Booklet will be mailed, as a hard copy, to all licensed trappers. Within this document, we will inform individuals of the new regulatory changes and provide visual diagrams of the new exclusion devices.

Note: the page numbers referenced below refer to the page numbers in the redline version of IFW's Plan and may not correspond to page numbers in the original Plan (submitted 10/24/14).

### **Title Page**

- Submission date was amended to include proposed minor amendments

### **Executive Summary**

- Page 11, bulleted number one, IFW amended the language to remove leaning pole sets and added the requirement that killer-type traps on land be set in an approved exclusion devices when set in WMD's 1-11, 14, 18, and 19.
- Page 11, bulleted number three, IFW changed the number of swivels from one to three.
- Page 11, following bulleted number 10, IFW added the following paragraph:

"During the 2014-2015 trapping season, two lynx were killed in legally set killer-type traps on leaning pole sets. Therefore, IFW is promulgating regulatory changes to ensure no additional lynx are killed. By committing to the use of exclusion devices in lynx zones for all killer-type traps (except those described in Section 3 Table 3, Regulation/Action 7 D 1-3, PLAN) IFW will eliminate the risk to lynx posed by killer-type traps set on leaning pole sets. The requirement to implement lynx exclusion devices on killer-type traps within lynx WMDs is a condition of the ITP, based on the triggering of changed circumstance number 3. As such, any future change or modification to that commitment requires following the permit amendment process established in chapter 8. However, outside of established lynx WMDs, IFW is not required to implement such devices on killer-type

traps, or can establish the parameters for such requirements based on its sole discretion, since the risk of catching lynx in traps in non-lynx WMDs is extremely low.

### **1.0 Introduction and Background**

- No changes were made

### **2.0 Environmental Setting / Biological Resources**

- No changes were made

### **3.0 Project Description / Activities Covered by Permit**

- In the summary, page 32, IFW has added the following sentence to the end of the first paragraph:

“Throughout this document, we state that no lynx were captured in marten and fisher traps that were lawfully set. During the 2014-15 trapping season that followed this Plan, two lynx were killed in killer-type traps that were lawfully set on leaning poles.”
- In Table 3.0, pages 34-47, IFW has added an additional column to reflect which regulations / actions will remain in place following approval of the requested minor amendments.
- In Table 3.0, page 45, regulation /action number 26 was added to identify that, in WMD’s 1-11, 14, 18, and 19, drags on foothold traps are prohibited and that catch circles must be clear of vegetation and other obstructions
- In Table 3.0, page 46, regulation / action number 27 was added to identify that statewide foothold traps set at or below ground level must have a chain that is mounted within the central portion of the base of the trap with a minimum of three swiveling points.
- In Table 3.0, page 47, regulation / action number 28 was added to identify that killer-type traps must be set in an exclusion device statewide unless the trap is set completely under water; or, for killer type traps with a jaw spread of  $\leq 5$ ” it can be set partially covered by water, under an overhanging stream bank, or used as a blind set.
- Section 3.2, page 60, at the bottom of the first paragraph of the page, IFW added the following sentence:

“During the 2014-15 trapping season that followed this Plan, two lynx were killed in killer-type traps that were lawfully set on leaning poles.”

### **4.0 Potential Biological Impacts / Take assessment**

- Section 4.1, page 72, IFW added the following sentence:

“Despite the original Plan’s minimization measures, two lynx were killed in killer-type traps that were lawfully set on leaning poles during the 2014-15 trapping season, and

thus triggering a changed circumstance under the adaptive management portion of the ITP.”

## 5.0 Conservation Program / Measures to Minimize and Mitigate for Impacts

- Section 5.2, page 88, Table 5.2.2, RC 1, IFW altered the commitment to reflect that exclusion devices will be allowed for killer-type traps whose jaw spread does not exceed 7 ½” except on blind sets not to exceed a 5” jaw spread.
- Section 5.2, page 88, Table 5.2.2, RC4, IFW altered the commitment to reflect that the IFW will require foothold traps to have trap chains mounted to the central portion of the base of the trap with a minimum of three swiveling points, and require staked traps with a catch circle clear of vegetation or other obstructions in WMD’s 1-11, 14, 18, 19.
- Section 5.2, pages 89-90, Table 5.5.2, O&E 7, Trapper Video, IFW will produce a second video showing how to build an exclusion device. PI 4, IFW altered compliance monitoring to reflect that IFW wardens will check 20% (40) of active trappers setting killer-type traps in the lynx range as a part of their routine activities.
- In Section 5.2.1, page 92, RC 1, IFW added the following sentence:

“During the 2014-15 trapping season that followed the October 2014 Plan, two lynx were killed in killer-type traps that were lawfully set on leaning poles. This change resulted in a minor amendment to this Plan in August 2015 that eliminates leaning pole sets without exclusion devices in lynx WMDs.”

- Section 5.2.1, pages 92-93, IFW altered the language of the commitment to reflect that IFW will prohibit the use of killer-type traps on or above the ground without an exclusion device unless set as described in Rule 09-137 Chapter 4.01 K page 29.
- Section 5.2.1, Page 94, Figure 5.2.1, IFW added text to reflect regulatory changes to lynx exclusion devices.
- Section 5.2.1, Page 97, RC 4, IFW altered the commitment to reflect that IFW will require trap chains to be mounted to the central portion of the base of the trap and have three swiveling points, and that foothold traps will be staked and catch circles cleared of vegetation or other obstructions in WMD’s 1-11, 14, 18, 19.
- Section 5.2.1, Page 110-111, O&E 7, IFW describes the second video that will be produced to show how to build an exclusion device.
- Section 5.2.1, page 114, PI 4, IFW added the following sentences to the Rationale and Background:

“However, killer-type traps on or above ground will not be allowed without an exclusion device beginning with the 2015-16 trapping season unless set as described in Appendix 2. Thus compliance monitoring to address the USFWS concern with leaning pole sets is

no longer necessary. However, IFW has agreed to check compliance on use of lynx exclusion devices as part of normal Warden Service activities.”

Section 5.2.1, pages 114-115, PI 4, IFW altered the Commitment language to:

- “During their routine activities, IFW Warden Service will check 20% of active trappers setting killer-type traps for fisher and marten in the lynx range each trapping season during the permit period for compliance with current regulations on exclusion devices<sup>4</sup>. IFW expects the number of trappers setting killer type traps for fisher and marten to decline based on the expense and difficulty in using exclusion devices. Therefore, IFW expects that number of trappers to be checked for compliance to be about one half of the number (40), that IFW anticipated checking on for compliance with the regulations governing leaning pole sets. The fur tagging record books used to record harvested fur will be modified prior to the 2015-16 trapping season to gather information from the trapper on whether or not the fur was taken by foot hold traps or killer type traps with exclusion devices. This information will be used to calibrate whether or not IFW has met the target for compliance monitoring. IFW biologists will analyze these data and use information from compliance monitoring to inform IFW’s contingency plans (Section 5.4).”
- Section 5.2.1, page 115, PI 4, IFW altered the implementation language to reflect that compliance checks for leaning pole sets will no longer be conducted since this is no longer a legal trapping method. Instead, compliance checks will be implemented for exclusion devices.
- Section 5.4, page 142, Changed Circumstance # 5, the trigger was altered to reflect that leaning pole sets are no longer a legal method and exclusion devices are required. Triggers for Changed Circumstance #5 now relate to compliance with the correct configurations of exclusion devices approved for use.

## **6.0 Funding**

- No Changes were made

## **7.0 Measures Considered but Not Implemented**

- No Changes were made

## **8.0 Future Amendments**

- No Changes were made

## **Literature Cited**

- No Changes were made

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<sup>4</sup> Study Limitations: There is no way to sample specific trappers without their knowledge. Maine trappers have no legal requirement to disclose the location of their traps or trap lines. Wardens often put more effort on checking past or suspected violators; therefore, the rate of non-compliance may be higher than from a random sample of trappers.

## Appendices

We replaced the previous Appendix 2 with a new Appendix 2 to reflect new regulatory change related to foothold and killer-type trapping statewide.

No changes have been made to other Appendices. For convenience sake, we are not including Appendix 1 and Appendices 3 -13.

Sincerely,

A handwritten signature in blue ink that reads "James M. Connolly". The signature is written in a cursive style with a large initial "J" and a long, sweeping underline.

James M. Connolly  
Director, Bureau of Resource Management

**From:** Lowell Whitney  
**To:** [McCollough, Mark](#)  
**Cc:** [laury\\_zicari@fws.gov](mailto:laury_zicari@fws.gov)  
**Subject:** Follow-up on today's call (Lynx HCP)  
**Date:** Wednesday, October 28, 2015 2:39:12 PM  
**Attachments:** [20150924 Lynx ITP submitted to USFWS on 10\\_28\\_14 with DRAFT minor amendments 09242015.docx](#)  
[20150924 Appendix 2.doc](#)  
[20150924 Letter of Request to amend MDIFW ITP JMC to Phifer TE48539B-0 09242015 .pdf](#)

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Mark,

Here are my thoughts on the letter contents. 1) We've reviewed the 2014 annual monitoring report. All of the reporting requirements listed in permit condition O were addressed, except for the copy of the trapper education course materials cited in O.16. Please provide us those materials. 2) We've reviewed the HCP and just want to remind IFW that there were a handful of commitments that are due within 1 year of permit issuance (Nov 17 2015). It would be good to get confirmation or update on implementation of those commitments. These will be included in the 2015 annual monitoring report, but it would be good to confirm their status as of the due date. They include: development of an injury score system (IM3), notification that the "how to avoid incidental take of lynx" brochure was updated and distributed (OE4), and updated trapper education manual (OE6). Their monitoring report says they were planning to provide training on injury assessment and lynx handling procedures within 1 year of permit issuance. But, I don't see that as a permit or ITP commitment per se, so I don't think we necessarily need confirmation that happened prior to Nov 17th. Finally, they should have an updated list of on-call veterinarians for this trapping season (IM 4). We may just want to remind them of that requirement. I suppose it can be the same last as before, as long as it is still accurate.

Finally, I think we should recommend an implementation meeting after this trapping season (perhaps after the annual report is provided) and before the 2016 trapping season.

Also, I've attached the amended track changes ITP (and related documents), for which IFW should be accepting the track changes and sending us a "clean" copy.

Call with questions on the letter contents,  
Lowell

-----  
**Lowell Whitney**  
R5 HCP Coordinator  
Endangered Species Program - Northeast Region  
U.S. Fish and Wildlife Service  
300 Westgate Center Drive  
Hadley, Massachusetts 01035-9589  
[lowell\\_whitney@fws.gov](mailto:lowell_whitney@fws.gov)  
(413) 253-8649  
(413) 887-1192 (cell)  
-----

**From:** [Alexej Siren](#)  
**To:** [Zelenak, Jim](#)  
**Cc:** [Heather Bell](#); [Mary Parkin](#); [Jonathan Cummings](#); [Jodi Bush](#)  
**Subject:** Re: question on webpage news item detailing SSA  
**Date:** Thursday, October 29, 2015 5:50:35 AM

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Hello Jim,

Wow... thanks for providing edits as well! I looked it over and accepted all of them. I will wait until later today to pass along to our media manager in case any other folks want do chime in.

I look forward to reviewing meeting notes when they become available.

Thanks again,

Alexej

On 2015-10-28 17:52, Zelenak, Jim wrote:

> Hi Alexej,  
>  
> Sorry it took me most of the day to get back to you on this. I've  
> made some suggestions in Track Changes in the attached document; use  
> as you see fit. I've also copied Heather, Mary and Jonathan in case  
> they have a chance to take a look and review the elicitation part of  
> this. If so, I trust they will provide you their thoughts as well.  
>  
> Thanks again for participating in the workshop. We will send you the  
> meeting notes when we have them compiled and organized.  
>  
> Take care,  
>  
> Jim  
>  
> On Wed, Oct 28, 2015 at 8:00 AM, Alexej Siren <asiren@eco.umass.edu>  
> wrote:  
>  
>> Hello Jim,  
>>  
>> I hope you are well and that the post-lynx SSA process is rolling  
>> along smoothly.  
>>  
>> I wanted to get your feedback on an item. I was asked to write up a  
>> brief (500 word) account of my experience at the SSA meeting for the  
>> DOI Northeast Climate Science Center webpage (see attached). I  
>> informed the media person that I needed to keep it as general as  
>> possible because the nature of the SSA. Would you mind looking at a  
>> draft to make sure that I am not violating any of the SSA  
>> guidelines? If you require that we wait on releasing the news feed,  
>> I can pass that along to the media person.  
>>  
>> Thanks and I look forward to hearing from you soon.  
>>

>> Alexej  
>  
> --  
>  
> Jim Zelenak, Biologist  
> U.S. Fish and Wildlife Service  
> Montana Ecological Services Office  
> 585 Shepard Way, Suite 1  
> Helena, MT 59601  
> (406) 449-5225 ext. 220  
> jim\_zelenak@fws.gov



**From:** [Alexej Siren](#)  
**To:** "[Cummings, Jonathan](#)"; "[Alexej Siren](#)"  
**Cc:** "[Zelenak, Jim](#)"; "[Heather Bell](#)"; "[Mary Parkin](#)"; "[Jodi Bush](#)"  
**Subject:** RE: question on webpage news item detailing SSA  
**Date:** Thursday, October 29, 2015 8:43:46 AM

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Hello Jonathan,

Thanks for clarifying this item; I will incorporate your edits. I hope this hasn't been a nuisance for you all. The web blog is a standard process at the NE CSC and given the nature of the workshop, I wanted to confer with you prior to releasing it online.

Many thanks,

Alexej

**From:** Cummings, Jonathan [mailto:jwccummings@usgs.gov]  
**Sent:** Thursday, October 29, 2015 10:32 AM  
**To:** Alexej Siren <asiren@eco.umass.edu>  
**Cc:** Zelenak, Jim <jim\_zelenak@fws.gov>; Heather Bell <heather\_bell@fws.gov>; Mary Parkin <mary\_parkin@fws.gov>; Jodi Bush <jodi\_bush@fws.gov>  
**Subject:** Re: question on webpage news item detailing SSA

Hi Alexej,

Thanks for sharing your write-up. It's always nice to have participants describe having accomplished what you intended to accomplish.

My only edit was to note that Mary and I didn't apply the Delphi approach per se, so I reworded that sentence to be more general.

The Delphi approach applies discussion periods differently, and responses are re-elicited with a goal of reaching a group opinion rather than individual opinion, so I don't want anyone to think we used Delphi specifically. The respond, discuss, respond again technique we often apply we refer to as a modified Delphi approach just to give it a name, but it has some important distinctions from a full Delphi approach.

Cheers,  
Jonathan

On Thu, Oct 29, 2015 at 7:50 AM, Alexej Siren <[asiren@eco.umass.edu](mailto:asiren@eco.umass.edu)> wrote:

Hello Jim,

Wow... thanks for providing edits as well! I looked it over and accepted all of them. I will wait until later today to pass along to our media manager in case any other folks want to chime in.

I look forward to reviewing meeting notes when they become available.

Thanks again,

Alexej

On 2015-10-28 17:52, Zelenak, Jim wrote:

Hi Alexej,

Sorry it took me most of the day to get back to you on this. I've made some suggestions in Track Changes in the attached document; use as you see fit. I've also copied Heather, Mary and Jonathan in case they have a chance to take a look and review the elicitation part of this. If so, I trust they will provide you their thoughts as well.

Thanks again for participating in the workshop. We will send you the meeting notes when we have them compiled and organized.

Take care,

Jim

On Wed, Oct 28, 2015 at 8:00 AM, Alexej Siren <[asiren@eco.umass.edu](mailto:asiren@eco.umass.edu)> wrote:

Hello Jim,

I hope you are well and that the post-lynx SSA process is rolling along smoothly.

I wanted to get your feedback on an item. I was asked to write up a brief (500 word) account of my experience at the SSA meeting for the DOI Northeast Climate Science Center webpage (see attached). I informed the media person that I needed to keep it as general as possible because the nature of the SSA. Would you mind looking at a draft to make sure that I am not violating any of the SSA guidelines? If you require that we wait on releasing the news feed, I can pass that along to the media person.

Thanks and I look forward to hearing from you soon.

Alexej

--

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--

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Laurel, MD 20708 USA  
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<https://profile.usgs.gov/jwcummings>

Remote Contact Info:  
Ph: 802-999-8684  
243 Locust St  
Dover, NH 03820

**From:** [McCollough, Mark](#)  
**To:** [Zelenak, Jim](#)  
**Subject:** Re: Expert elicitation presentations  
**Date:** Thursday, October 29, 2015 11:39:39 AM

---

Thanks. Found 'em. Not sure how I missed that. Getting good practice with google docs. M.

On Thu, Oct 29, 2015 at 1:35 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

They are on the drive under Workshop Materials--->in a folder called Workshop Presentations.

On Thu, Oct 29, 2015 at 11:32 AM, McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)> wrote:

Jim:

Do you know if expert elicitation power points have been posted or shared yet? I didn't seem them in the Google Docs SSA folder.

I'm specifically looking for Erin's presentation from Maine.

thanks, Mark

--

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**From:** [Bowman, Jeff \(MNRF\)](#)  
**To:** [Zelenak, Jim](#)  
**Cc:** [Dennis Murray \(dennismurray@trentu.ca\)](#)  
**Subject:** RE: Lynx Genomics Proposal  
**Date:** Thursday, October 29, 2015 11:43:30 AM

---

Thanks Jim,

I'll have a look and discuss with colleagues here and get back to you.

Jeff

**From:** Zelenak, Jim [mailto:[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)]  
**Sent:** October 28, 2015 12:22 PM  
**To:** Bowman, Jeff (MNRF); Dennis Murray  
**Cc:** Mark McCollough; Laury Zicari; Jodi Bush  
**Subject:** Fwd: Lynx Genomics Proposal

Hi Jeff and Dennis,

I was wondering if you both could take a look at the attached lynx genomics project statement, of which we (USFWS) just recently became aware. I'd appreciate your thoughts on the project (it's merits/likelihood that it will result in improvements in our understanding or lynx genetics/genomics) and I'd like to know if the project proponents have been in touch with either of you in terms of cooperation/collaboration. It's unclear in the proposal whether they've done so or not.

I've also forwarded this to Mike Schwartz to get his take. It definitely seems like this project presents an opportunity for, and would benefit from, collaboration with both your lab and with Mike's, as well as with other folks who have lynx genetic samples from the Lower 48 and southern Canada.

I'd appreciate your thoughts on this.

Thanks,

Jim

----- Forwarded message -----

**From:** **Zicari, Laury** <[laury\\_zicari@fws.gov](mailto:laury_zicari@fws.gov)>  
**Date:** Wed, Oct 21, 2015 at 9:34 AM  
**Subject:** Fwd: Lynx Genomics Proposal  
**To:** Jim Zelenak <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>  
**Cc:** Mark McCollough <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>

Not sure if they coordinated with you, Jim.

----- Forwarded message -----

**From:** **Jakubas, Walter** <[Walter.Jakubas@maine.gov](mailto:Walter.Jakubas@maine.gov)>

Date: Wed, Oct 21, 2015 at 10:27 AM

Subject: Lynx Genomics Proposal

To: "McCollough, Mark" <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>, Laury Zicari  
<[laury\\_zicari@fws.gov](mailto:laury_zicari@fws.gov)>

Cc: "Vashon, Jennifer" <[Jennifer.Vashon@maine.gov](mailto:Jennifer.Vashon@maine.gov)>, "Connolly, James"  
<[James.Connolly@maine.gov](mailto:James.Connolly@maine.gov)>, "Haskell, Shawn" <[Shawn.Haskell@maine.gov](mailto:Shawn.Haskell@maine.gov)>

Mark and Laury,

Talking to Mark yesterday, I realized that he was not aware of a new Lynx Genomics study is just getting underway. Attached is the project statement for the proposal. Principal Investigators include John Organ, USGS; Todd Fuller, University of Massachusetts, Amherst; Steve DeStefano, Massachusetts Cooperative Fish and Wildlife Research Unit at UMass Amherst; Tanya Lama, Ph.D. student at the Mass Coop Unit/UMass Amherst; and Warren Johnson, Smithsonian Institution. Jen will help advise Tanya. Michael Hofreiter, Potsdam University, Brandenburg, Germany, and some of his colleagues that have worked on Iberian Lynx will also be cooperating on the study.

*Wally*

--

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [McCollough, Mark](#)  
**To:** [Zelenak, Jim](#)  
**Subject:** Re: Expert elicitation presentations  
**Date:** Thursday, October 29, 2015 1:39:36 PM

---

Thanks. Found 'em. Not sure how I missed that. Getting good practice with google docs. M.

On Thu, Oct 29, 2015 at 1:35 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

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Cell Phone: 207 944-5709  
[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)

**From:** [Cummings, Jonathan](mailto:Cummings.Jonathan)  
**To:** [Zelenak, Jim](mailto:Zelenak, Jim)  
**Subject:** Re: expert graph question  
**Date:** Friday, October 30, 2015 8:08:53 AM

---

For the plotting I'll use NAs, but converting the blanks to NAs is quick find replace in excel so either is fine.

On Fri, Oct 30, 2015 at 10:03 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Which reminds me of another question: Do you want NAs? I've just been leaving blanks where not data were indicated on the graphs.

On Fri, Oct 30, 2015 at 6:23 AM, Cummings, Jonathan <[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)> wrote:

Yeah, I wouldn't know how to interpret that from what was given to us, so a follow up is worth it. Especially because there look to be 4 points along the y axis. If I entered it as is I would just enter the most likely points and enter NAs for everything else.

On Thu, Oct 29, 2015 at 5:30 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Could you take a look at GYA graph from expert 9 and let me know your thoughts? Squires seems to have ignored the low/high directions, although I'm wondering if he meant that the lower-upper dots on the 2015 line (upper = 0.4; lower = 0.01[?]) are constant for the other years.

I can also email it to him if you and i think we need clarity.

Thanks.

--

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| Name                       | Type    | TA Num        | Trip Name     | PNR #         | Depart Date ▼ | Last Stamped | Status    | In Use By |
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| <a href="#">TV0000ASS6</a> | Voucher | TANUM0000FD4X | Lynx Workshop | HRB6Q4,GR69R9 | 10/13/2015    | 10/30/2015   | T-ENTERED |           |

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**From:** Kaimy Marks  
**To:** [Shay White](mailto:Shay.White); [Laury Zicari](mailto:Laury.Zicari)  
**Subject:** RE: Funding for lynx expert meeting - MAINE invitational travelers  
**Date:** Friday, October 30, 2015 9:58:13 AM  
**Attachments:** [image001.png](#)

I'm not sure. Can you do a search on her name or the voucher number maybe? Info below:

You are administering travel for: [SIMONS-LEGAARD, ERIN](#) ▼

| Vouchers                        |         |               |               |               |               |              |           |           |  |
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| <a href="#">Search Vouchers</a> |         |               |               |               |               |              |           |           |  |

**From:** White, Shay [mailto:[shay\\_white@fws.gov](mailto:shay_white@fws.gov)]  
**Sent:** Friday, October 30, 2015 9:55 AM  
**To:** Kaimy Marks; Laury Zicari  
**Subject:** Re: Funding for lynx expert meeting - MAINE invitational travelers

Hi Kaimy,

I checked it when I got the notice for concur but she does not show up in my arrangers list, so I can't see her voucher information. Do you know how I get past that? If only my Concur administrator at the RO can fix it, she will not be in until next Monday but can ask her then.

Shay

On Fri, Oct 30, 2015 at 11:39 AM, Kaimy Marks <[kaimy\\_marks@fws.gov](mailto:kaimy_marks@fws.gov)> wrote:  
Hello-

I've just entered a completed travel voucher for Erin Simons-Legaard but I'm not able to change her routing in Concur, so is it possible for you to approve it? Our accounting info is entered in the voucher so we'll pay for it.

Kaimy Marks  
Administrative Support Assistant  
U.S. Fish & Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1, Helena, MT 59601  
406-449-5225 X207

**From:** McCollough, Mark [mailto:[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)]  
**Sent:** Monday, September 28, 2015 10:19 AM  
**To:** Kaimy Marks; Shay White; Laury Zicari  
**Subject:** Re: Funding for lynx expert meeting - MAINE invitational travelers

Kaimy:

I just met with Erin Simons-Legaard at UMaine. We have her signed up in Concur as an Invitational Traveler. She will be calling you shortly to arrange for flight, hotel, and other expenses. If possible, we would like your office to pay for expenses.

Dan Harrison and Jen Vashon have said that they will pay their own way to the lynx expert meeting in MN.

Thanks, Mark McCollough

On Thu, Sep 24, 2015 at 3:45 PM, Kaimy Marks <[kaimy\\_marks@fws.gov](mailto:kaimy_marks@fws.gov)> wrote:  
Hi Mark-

Just checking/confirming – were you able to get Erin Simons set up as an invitational traveler and take care of her for this meeting?

And Dan Harrison and Jennifer Vashon will **NOT** need travel assistance?

Please let me know, don't want to assume anything and drop the ball!

Kaimy Marks  
Administrative Support Assistant  
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585 Shepard Way, Suite 1, Helena, MT 59601  
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**From:** McCollough, Mark [mailto:[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)]  
**Sent:** Wednesday, August 26, 2015 8:43 AM  
**To:** Zelenak, Jim  
**Cc:** Laury Zicari; Sharon Hooley; Kaimy Marks; Jodi Bush  
**Subject:** Re: Funding for lynx expert meeting

Jim et al:

I believe only Erin Simons from Maine needs travel assistance to MN. We have funds here that we could apply to Erin's travel. We are having her fill out Invitational Travel forms today to get her into the Concur system before it closes for the end of the fiscal year. We cannot proceed further in Concur with Travel Authorization, etc. until we have further logistic info for the upcoming meeting.

Any thoughts, concerns?

thanks, Mark McCollough

On Wed, Aug 26, 2015 at 10:35 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:  
Thanks Mark and Laury.

I've copied Jodi and our Administrative Experts here. I'm guessing any help will be welcomed, but will let Sharon or Kaimy reply if they foresee any issues/difficulties with the Maine

Field Office paying travel and lodging costs for non-USFWS Maine participants in the Lynx SSA Expert Elicitation Workshop in Minneapolis in mid-Oct.

On Tue, Aug 25, 2015 at 1:07 PM, McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)> wrote:

Jim: I just talked to Laury about our call today and sent an email to our three potential invitees from Maine. We have some end-of-year funds that we would like to use. I reminded the Maine invitees that we are still planning the Oct 13-15 meeting and that if they need help with funding to let our field office know by Friday. Laury supports obligating funds for airfare and hotel for the three from Maine (perhaps they could cover their per diem?), if needed.

Is this OK with you folks???

Mark

--

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Endangered Species Specialist  
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Shay White  
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Ecological Services  
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Orono, Maine 04473  
Telephone: 207/866-3344 Ext. 157  
Fax: 207/866-3351

**From:** Zicari, Laury  
**To:** [Kaimy Marks](#)  
**Cc:** [Shay White](#)  
**Subject:** Re: Funding for lynx expert meeting - MAINE invitational travelers  
**Date:** Friday, October 30, 2015 9:58:49 AM

---

be glad to -- Shay do you need to do something first?

thanks

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**To:** Zelenak, Jim

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**From:** [Zelenak, Jim](#)  
**To:** [Jonathan Cummings](#); [Mark McCollough](#); [Tamara Smith](#); [Kurt Broderdorp](#); [Bryon Holt](#); [Mary Parkin](#); [Heather Bell](#); [Seth Willey](#); [Jodi Bush](#); [Justin Shoemaker](#)  
**Subject:** Lynx Workshop Expert Persistence Graphs Data  
**Date:** Friday, October 30, 2015 10:04:15 AM

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Sorry if google drive already notified you of this but, in case not, I wanted to let folks know that I entered the data in the spreadsheet Jonathan developed and just uploaded it to the share drive in the "Expert Persistence Graphs" folder within the Workshop Materials folder.

I've highlighted a few cells where I'm waiting for a reply from one of the experts who forgot or chose not to include the lower and higher probability bounds for one of the graphs.

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** Kaimy Marks  
**To:** [Shay White](#); [Laury Zicari](#)  
**Subject:** RE: Funding for lynx expert meeting - MAINE invitational travelers  
**Date:** Friday, October 30, 2015 10:12:14 AM

---

Thanks Shay-

Looks like Laury or Simon need to approve it. Then it will be done! ☺

**From:** White, Shay [mailto:[shay\\_white@fws.gov](mailto:shay_white@fws.gov)]  
**Sent:** Friday, October 30, 2015 10:08 AM  
**To:** Kaimy Marks; Laury Zicari  
**Subject:** Re: Funding for lynx expert meeting - MAINE invitational travelers

Ok Kaimy,

I cut and pasted her name in the search and that brought it up, I must have misspelled it. I was able to go through the review process of the voucher. Hopefully it is all set or to a point of you getting to finish it up?

Shay

On Fri, Oct 30, 2015 at 11:39 AM, Kaimy Marks <[kaimy\\_marks@fws.gov](mailto:kaimy_marks@fws.gov)> wrote:  
Hello-

I've just entered a completed travel voucher for Erin Simons-Legaard but I'm not able to change her routing in Concur, so is it possible for you to approve it? Our accounting info is entered in the voucher so we'll pay for it.

Kaimy Marks  
Administrative Support Assistant  
U.S. Fish & Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1, Helena, MT 59601  
406-449-5225 X207

**From:** McCollough, Mark [mailto:[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)]  
**Sent:** Monday, September 28, 2015 10:19 AM  
**To:** Kaimy Marks; Shay White; Laury Zicari  
**Subject:** Re: Funding for lynx expert meeting - MAINE invitational travelers

Kaimy:

I just met with Erin Simons-Legaard at UMaine. We have her signed up in Concur as an Invitational Traveler. She will be calling you shortly to arrange for flight, hotel, and other expenses. If possible, we would like your office to pay for expenses.

Dan Harrison and Jen Vashon have said that they will pay their own way to the lynx expert meeting in MN.

Thanks, Mark McCollough

On Thu, Sep 24, 2015 at 3:45 PM, Kaimy Marks <[kaimy\\_marks@fws.gov](mailto:kaimy_marks@fws.gov)> wrote:

Hi Mark-

Just checking/confirming – were you able to get Erin Simons set up as an invitational traveler and take care of her for this meeting?

And Dan Harrison and Jennifer Vashon will **NOT** need travel assistance?

Please let me know, don't want to assume anything and drop the ball!

Kaimy Marks  
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406-449-5225 X207

**From:** McCollough, Mark [mailto:[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)]  
**Sent:** Wednesday, August 26, 2015 8:43 AM  
**To:** Zelenak, Jim  
**Cc:** Laury Zicari; Sharon Hooley; Kaimy Marks; Jodi Bush  
**Subject:** Re: Funding for lynx expert meeting

Jim et al:

I believe only Erin Simons from Maine needs travel assistance to MN. We have funds here that we could apply to Erin's travel. We are having her fill out Invitational Travel forms today to get her into the Concur system before it closes for the end of the fiscal year. We cannot proceed further in Concur with Travel Authorization, etc. until we have further logistic info for the upcoming meeting.

Any thoughts, concerns?

thanks, Mark McCollough

On Wed, Aug 26, 2015 at 10:35 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:  
Thanks Mark and Laury.

I've copied Jodi and our Administrative Experts here. I'm guessing any help will be welcomed, but will let Sharon or Kaimy reply if they foresee any issues/difficulties with the Maine Field Office paying travel and lodging costs for non-USFWS Maine participants in the Lynx SSA Expert Elicitation Workshop in Minneapolis in mid-Oct.

On Tue, Aug 25, 2015 at 1:07 PM, McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)> wrote:  
Jim: I just talked to Laury about our call today and sent an email to our three potential invitees from Maine. We have some end-of-year funds that we would like to use. I reminded the Maine invitees that we are still planning the Oct 13-15 meeting and that if they need help with funding to let our field office know by Friday. Laury supports obligating funds for airfare and hotel for the three from Maine (perhaps they could cover their per diem?), if needed.

Is this OK with you folks???

Mark

--

Mark McCollough, Ph.D.  
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Maine Field Office  
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17 Godfrey Drive, Suite 2  
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Shay White  
Administrative Officer  
US Fish and Wildlife Service  
Ecological Services  
Maine Field Office  
17 Godfrey Drive, Suite 2  
Orono, Maine 04473  
Telephone: 207/866-3344 Ext. 157  
Fax: 207/866-3351



**From:** Kaimy Marks  
**To:** [Laury Zicari](mailto:Laury.Zicari@fws.gov); [Shay White](mailto:Shay.White@fws.gov)  
**Subject:** RE: Funding for lynx expert meeting - MAINE invitational travelers  
**Date:** Friday, October 30, 2015 10:24:03 AM

---

Super, thank you!

**From:** Zicari, Laury [mailto:[laury\\_zicari@fws.gov](mailto:laury_zicari@fws.gov)]  
**Sent:** Friday, October 30, 2015 10:13 AM  
**To:** White, Shay  
**Cc:** Kaimy Marks  
**Subject:** Re: Funding for lynx expert meeting - MAINE invitational travelers

ALL set -- the system let me review and approve!!!

On Fri, Oct 30, 2015 at 12:08 PM, White, Shay <[shay\\_white@fws.gov](mailto:shay_white@fws.gov)> wrote:  
Ok Kaimy,

I cut and pasted her name in the search and that brought it up, I must have misspelled it. I was able to go through the review process of the voucher. Hopefully it is all set or to a point of you getting to finish it up?

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Laury Zicari  
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17 Godfrey Drive, Suite 2  
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207-866-3344 x 1111  
Fax 866-3351  
Cell 207-949-0561

**From:** [Cummings, Jonathan](#)  
**To:** [Mary Parkin](#); [Heather Bell](#); [Jodi Bush](#); [Seth Willey](#); [Jim Zelenak](#); [Kurt Broderdorp](#); [Mark McCollough](#); [Tamara Smith](#); [Justin Shoemaker](#)  
**Subject:** EE portion of meeting notes.  
**Date:** Friday, October 30, 2015 2:55:38 PM

---

I've finished my additions to the expert elicitation portion of the notes. I did do anything with the factors elicited from the resiliency section as there isn't any math or figure production needed. I suppose you could update conceptual models with them, but I think you'll know how to do that so I'm leaving summarizing the resiliency factors to you.

If any of the figures or methods I used aren't clear let me know.

Cheers,  
Jonathan

--

Jonathan W. Cummings, PhD  
Research Ecologist  
USGS - Patuxent Wildlife Research Center (remotely located)  
12100 Beech Forest Road  
Laurel, MD 20708 USA  
[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)  
<https://profile.usgs.gov/jwcummings>

Remote Contact Info:  
Ph: 802-999-8684  
243 Locust St  
Dover, NH 03820

**From:** [Bush, Jodi](#)  
**To:** [Vashon, Jennifer](#)  
**Cc:** [Zelenak, Jim](#)  
**Subject:** Re: Lynx call  
**Date:** Friday, October 30, 2015 4:03:28 PM

---

Thanks for the kind words Jennifer and thanks for being there. JB

Jodi L. Bush  
Field Supervisor  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225, ext.205

On Fri, Oct 30, 2015 at 3:20 PM, Vashon, Jennifer <[Jennifer.Vashon@maine.gov](mailto:Jennifer.Vashon@maine.gov)> wrote:

Hi Jim and Jodi,

I'm sorry I didn't get back to you sooner. I appreciate your extra effort to provide me the opportunity to comment. Although I lost you for a bit, I was able to get back on the call and heard most of the discussion.

I agree, it was a great meeting. I think the challenge is providing those on the call that were not able to attend with an appreciation of the information and discussion that occurred. As stated throughout the meeting, getting everyone together again was very valuable and long overdue. The updates from local experts about the status of lynx across the US and southern Canada were very informative. As you mentioned, we all struggled a bit at the start of the expert elicitation portion of the meeting, but the ability to discuss, seek clarification, and adapt to feedback was helpful and greatly appreciated. You pulled together a great group of knowledgeable people that were very committed to helping you obtain information for your status assessment. I greatly appreciated the opportunity to participate. If you have any further questions, please do not hesitate to call me.

Have a great weekend,

Jen

---

Jennifer Vashon-MDIFW's Mammal Program

Canada Lynx and Black Bear Biologist

Maine Department of Inland Fisheries and Wildlife

650 State St. Bangor, ME 04401

[jennifer.vashon@maine.gov](mailto:jennifer.vashon@maine.gov)

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207.941.4450 (fax)

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*Correspondence to and from this office is considered a public record and may be subject to a request under the Maine Freedom of Access Act. Information that you wish to keep confidential should not be included in email correspondence.*

**From:** Zelenak, Jim [mailto:[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)]

**Sent:** Wednesday, October 28, 2015 3:29 PM

**To:** Vashon, Jennifer

**Cc:** Jodi Bush

**Subject:** Lynx call

Hi Jennifer,

Sounded like we lost you on the call just when you were about to let the group know your thoughts about the meeting. If you do have something you'd like to share, email it to me and I will send it around to the group on the phone today.

Hope all is well there.

Jim

--

Jim Zelenak, Biologist

U.S. Fish and Wildlife Service

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)



**From:** [Erin Simons-Legaard](#)  
**To:** [McCollough, Mark](#)  
**Subject:** Re: Lynx probability map available?  
**Date:** Monday, November 02, 2015 10:38:01 AM

---

I think this should be high enough res without being too huge, but let me know if you need it higher.

 Lynx POC 2010.jpg

Erin

Erin Simons-Legaard  
Research Assistant Professor  
School of Forest Resources  
5755 Nutting Hall  
University of Maine  
Orono, ME 04469-5755  
[erin.simons@maine.edu](mailto:erin.simons@maine.edu)

On Mon, Nov 2, 2015 at 10:24 AM, McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)> wrote:

Erin:

Thanks for getting back to me. Initially, could you provide a jpeg of the lynx habitat model with township lines (in white)? Eventually, it would be valuable to have arcgis files that we could use.

I'm glad you talked to Dan, and relayed how the Service's expert meeting went two weeks ago in MN. I talked with Dan several times prior to the meeting, so he was aware of the format of the meeting - more than just a 15-minute presentation. We did not handle the situation with MDIFW and Dan well, and I understand his reaction, however, he also knew that the majority of the meeting was a structured process and dialogue. Given how there are differences of opinion about the status of lynx, hares, and forestry in Maine it was unfortunate that Dan's valuable expertise was not part of the dialogue. However, you did a great job representing the science generated at UMaine. Thanks so much for preparing a presentation and providing input. I trust this was a good professional opportunity for you.

We are two weeks into the trapping season, and so far no lynx have been reported caught. In past years, most of the lynx are caught the first couple weeks of the season. No doubt some will be reported by the end of the season. However, given MDIFW's reliance and interpretation of this index, perhaps Maine's lynx population has dramatically declined from last year when 20 lynx were reported trapped? Or perhaps there are other hypotheses?

Look forward to seeing the map.

Thanks, Mark

On Mon, Nov 2, 2015 at 9:03 AM, Erin Simons-Legaard <[erin.simons@maine.edu](mailto:erin.simons@maine.edu)> wrote:  
Hi Mark,

Of course, how do you want it? As a .jpg or in a format that you can look at in ArcGIS? Or both.

I have seen Dan a couple of times as we were both attending the CFRU field tour last Thursday. He asked how it went and we talked about it briefly. He reiterated all the reasons that he refused to go and I tried to explain how his refusal had affected the format in probably a good way (i.e., no shared or back to back presentations by UMaine and MDIFW). But, I also tried to reinforce the nice tenor and openness of the meeting discussions that emerged out the general free form nature of the whole thing. For my part, I am glad I was there to participate and watch it play out. All in all I found the entire group interesting and good to be around for a new investigator type like myself.

Erin

Erin Simons-Legaard  
Research Assistant Professor  
School of Forest Resources  
5755 Nutting Hall  
University of Maine  
Orono, ME 04469-5755  
[erin.simons@maine.edu](mailto:erin.simons@maine.edu)

On Thu, Oct 29, 2015 at 1:52 PM, McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)> wrote:

Erin: I just reviewed the presentation that you left with us after the SSA expert meeting in MN. It contains a lot of great material, but I see that you left out the current and future lynx probability map(s).

That's OK. I know you are busy finishing your report. However, I wondered if you might be able to share the current (expanded) lynx probability map with me? I am working with the Number 9 wind project, and am very curious how your model predicts current habitat conditions in that area. We are also tasked to review a conservation proposal for several \$million in western Maine. Your model may not extend as far south as Reddington Twp.?

At any rate, I would promise to keep the map under wraps and only for my use here until your report is produced. If you are comfortable with this, would there be a way to add township boundaries to the map?

Thanks for your presentation and participation in the MN workshop. Many in the Service were impressed with your presentation and it provided extremely important science. We had a call with the state agencies yesterday, and they all thought the workshop went well from their perspective.

Is Dan back yet? I have not had a chance to catch up with him after he made his decision. I'm curious if you were able to let him know how the workshop went?

Mark

--

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[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Karl Halupka](#)  
**Subject:** Re: resources that may be helpful  
**Date:** Tuesday, November 03, 2015 12:58:12 PM

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Thanks Karl.

I'd seen the wolverine report before, but not the EE paper and appendix.

On Tue, Nov 3, 2015 at 10:51 AM, Karl Halupka <[karl\\_halupka@fws.gov](mailto:karl_halupka@fws.gov)> wrote:

All this may be old news, but if not could help to expedite completing the report summarizing the expert elicitation results.

Cheers,

k

Karl Halupka

Fish and Wildlife Biologist

U.S. Fish and Wildlife Service

Central Washington Field Office

215 Melody Lane, Suite 103

Wenatchee, WA 98801-8122

Phone: 509-665-3508 x 2001

Fax: 509-665-3509

[www.fws.gov/wafwo/](http://www.fws.gov/wafwo/)

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Holt, Bryon](#)  
**To:** [Zelenak, Jim](#)  
**Subject:** Re: Lynx SSA call/webinar next Tues. Nov. 10  
**Date:** Wednesday, November 04, 2015 8:33:53 AM

---

Hi Jim,

I can make the call and time.

Bryon

On Mon, Nov 2, 2015 at 12:39 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Hi Core Team:

Heather has arranged for a guest presentation on the Core Team call next week of an example SSA. However, it will require that the Core Team start at 9 AM Mountain Time rather than the usual 10 AM. Please let me know that you are able and intend to attend.

I will provide webinar link later this week.

Thanks,

Jim

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\*\*\*\*\*

Bryon Holt  
U.S. Fish and Wildlife Service  
Northern Idaho Field Office, Spokane, WA  
Telephone: (509) 893-8014  
Fax: (509) 891-6748  
email: [bryon\\_holt@fws.gov](mailto:bryon_holt@fws.gov)

\*\*\*\*\*

**From:** [Zelenak, Jim](#)  
**To:** [Smith, Tamara](#)  
**Cc:** [Heather Bell](#)  
**Subject:** Re: Lynx SSA call/webinar next Tues. Nov. 10  
**Date:** Wednesday, November 04, 2015 8:48:24 AM

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Heather arranged for Susan Oetker to present the SSA for the Page (?) Springtail.

On Wed, Nov 4, 2015 at 8:26 AM, Smith, Tamara <[tamara\\_smith@fws.gov](mailto:tamara_smith@fws.gov)> wrote:

Hi Jim - I think I'll be on leave and unable to attend on Nov. 10. Who will the guest be - Jennifer Szymanski?

On Mon, Nov 2, 2015 at 2:39 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

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**From:** [Erin Simons-Legaard](#)  
**To:** [McCollough, Mark](#)  
**Subject:** Re: question re. Lynx model results  
**Date:** Wednesday, November 04, 2015 10:09:50 AM

---

The first thing that comes to mind is that we could maybe calculate % change in amount of hqhh (negative and positive) at the township level? Or, amount of area with >50% POC (or some other probability threshold)? Something like that.

Erin Simons-Legaard  
Research Assistant Professor  
School of Forest Resources  
5755 Nutting Hall  
University of Maine  
Orono, ME 04469-5755  
[erin.simons@maine.edu](mailto:erin.simons@maine.edu)

On Wed, Nov 4, 2015 at 9:49 AM, McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)> wrote:  
Erin: Its interesting to compare your lynx model maps from 2004 (your dissertation p. 100) and 2010 imagery. Habitat has shifted somewhat.

Are there metrics to measure change in these maps? In other words can the total area of habitat with >50% or 75% probability be calculated? Are there metrics that can spatially analyze the polygons? In other words, I think that visually I can see that the habitat, overall, has shifted south in the Moosehead Lake area. Are there metrics to measure such things?

thanks, Mark

--

Mark McCollough, Ph.D.  
Endangered Species Specialist  
Maine Field Office  
U. S. Fish and Wildlife Service  
17 Godfrey Drive, Suite 2  
Orono, ME 04473  
Phone [207 866-3344](tel:207-866-3344) x115  
Cell Phone: [207 944-5709](tel:207-944-5709)  
[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)



**From:** [Smith, Tamara](#)  
**To:** [Zelenak, Jim](#)  
**Cc:** [Mark McCollough](#); [Bryon Holt](#); [Kurt Broderdorp](#); [Mary Parkin](#); [Heather Bell](#); [Jonathan Cummings](#); [Jodi Bush](#); [Seth Willey](#)  
**Subject:** Re: Lynx SSA call/webinar next Tues. Nov. 10  
**Date:** Wednesday, November 04, 2015 10:26:42 AM

---

Hi Jim - I think I'll be on leave and unable to attend on Nov. 10. Who will the guest be - Jennifer Szymanski?

On Mon, Nov 2, 2015 at 2:39 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Hi Core Team:

Heather has arranged for a guest presentation on the Core Team call next week of an example SSA. However, it will require that the Core Team start at 9 AM Mountain Time rather than the usual 10 AM. Please let me know that you are able and intend to attend.

I will provide webinar link later this week.

Thanks,

Jim

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

--

Tamara Smith  
U.S. Fish and Wildlife Service  
Twin Cities Field Office  
4101 American Boulevard East  
Bloomington, MN 55425  
612-725-3548 ext. 2219  
612-600-1599 cell

**From:** Delphey, Phil  
**To:** [Ann Belleman](#)  
**Subject:** Mittal Steel BO  
**Date:** Friday, November 06, 2015 8:35:00 AM  
**Attachments:** [Biological Opinion.pdf](#)

---

Ann -

Here is the one I was thinking of. We anticipated IT of wolf to result from road kill and then it actually happened.

Let me know if you'd like the MS Word version.

Phil

--

Phil Delphey  
Twin Cities Ecological Services Field Office  
U.S. Fish and Wildlife Service  
4101 American Blvd. E.  
Bloomington, MN 55425  
612.725-3548 ext. 2206

**From:** [Kurt Broderdorp](#)  
**To:** [Jim Zelenak](#)  
**Subject:** RE: Lynx SSA call/webinar next Tues. Nov. 10  
**Date:** Monday, November 09, 2015 2:59:08 PM

---

I will be on the call/webinar.

Kurt Broderdorp  
US Fish and Wildlife Service  
(970) 628-7186

**From:** Zelenak, Jim [mailto:[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)]  
**Sent:** Monday, November 02, 2015 1:40 PM  
**To:** Mark McCollough; Tamara Smith; Bryon Holt; Kurt Broderdorp  
**Cc:** Mary Parkin; Heather Bell; Jonathan Cummings; Jodi Bush; Seth Willey  
**Subject:** Lynx SSA call/webinar next Tues. Nov. 10

Hi Core Team:

Heather has arranged for a guest presentation on the Core Team call next week of an example SSA. However, it will require that the Core Team start at 9 AM Mountain Time rather than the usual 10 AM. Please let me know that you are able and intend to attend.

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Thanks,

Jim

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Bush, Jodi](#)  
**Subject:** Re: Optional Alternative Template to Streamline 5-Year Reviews  
**Date:** Tuesday, November 10, 2015 8:50:59 AM

---

Hey - whaddayaknow? I already had these in there....

On Tue, Nov 10, 2015 at 8:46 AM, Bush, Jodi <[jodi\\_bush@fws.gov](mailto:jodi_bush@fws.gov)> wrote:  
For your file - Lynx 5 year review. JB

Jodi L. Bush  
Field Supervisor  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225, ext.205

----- Forwarded message -----

**From:** **Willey, Seth** <[seth\\_willey@fws.gov](mailto:seth_willey@fws.gov)>  
**Date:** Wed, Apr 2, 2014 at 3:11 PM  
**Subject:** Optional Alternative Template to Streamline 5-Year Reviews  
**To:** FW6 ESA Practitioner <[fw6\\_esa\\_practitioner@fws.gov](mailto:fw6_esa_practitioner@fws.gov)>

Last year, we pulled together a R6 team to develop an optional alternative template to streamline 5-year reviews. This effort was intended to allow us to spend less time on 5-year reviews, where appropriate.

The new R6 template encourages authors to write up a short and concise review, but recognizes that more detailed text may be appropriate in some cases. Therefore, it allows for the author to personalize the review depending on the situation and need, and offers examples for both concise versions and more thorough versions. Excluding the instructions, the new template is 3 pages, plus a signature page and two worksheets. The longer version with instructions is attached.

Special thanks to James Boyd, Shannon Downey, Gina Glenne, Bekee Hotze, Genevieve Skora, and Kathy Konishi for assisting in this effort. Feedback on the new template and its utility, how it compares to the standard template, and any additional thoughts would be appreciated as we expect to update it periodically.

As always, feel free to give me a call to discuss! Hopefully this is helpful!

Seth

\*\*\*\*\*

Seth L. Willey  
Assistant Regional ESA Chief &  
Regional Recovery Coordinator  
[Seth\\_Willey@fws.gov](mailto:Seth_Willey@fws.gov)

303-236-4257

\*\*\*\*\*

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Google Docs](#)  
**To:** [mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)  
**Subject:** 2015 10 27 Lynx SSA Expert Elicitation Workshop - Notes - ...  
**Date:** Thursday, November 12, 2015 11:41:23 AM  
**Attachments:** [logo.png](#)

---

Mary Parkin and Heather Bell added comments to [2015 10 27 Lynx SSA Expert Elicitation Workshop - Notes - JShoemaker.docx](#)

---



**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

Reply

Open



**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

Reply

Open



**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

Reply

Open



**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

Reply

Open

---



**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

Reply

Open

---



**Mark McCollough**  
Made a comment



**Mary Parkin**  
*Marked as resolved*

Reply

Open

---



**Mark McCollough**  
Made a comment



**Mary Parkin**  
*Marked as resolved*

Reply

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**From:** [Bell, Heather](#)  
**To:** [Jim Zelenak](#)  
**Cc:** [Mary Parkin](#)  
**Subject:** Jim, Lynx workshop notes are ready for your review. and...  
**Date:** Thursday, November 12, 2015 11:50:37 AM

---

We made a lot of progress today. Please review the notes [https://docs.google.com/document/d/1iKh6cvlZBRBOlRjix\\_7Lx8TaTvnpnUAQIjsWfZTM3584/edit#](https://docs.google.com/document/d/1iKh6cvlZBRBOlRjix_7Lx8TaTvnpnUAQIjsWfZTM3584/edit#) as there are a few questions for you.

Mary and I are getting other folders organized so that we can make a zip package. Mary is doing some other stuff to get us organized so Please connect with Mary about what will go in the zip package and text for the email.

Still hoping for COB friday, but at latest COB monday!

Heather Bell  
Ecological Services HQ  
Branch of Conservation Integration  
SSA Framework Team Lead  
Remotely Located at  
134 S. Union Blvd  
Lakewood, CO 80228  
303-236-4514

Check it out! SSA Framework - Google Site for Staff at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>



**From:** [Google Docs](#)  
**To:** [mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)  
**Subject:** 2015 10 27 Lynx SSA Expert Elicitation Workshop - Notes - ...  
**Date:** Thursday, November 12, 2015 12:13:16 PM  
**Attachments:** [logo.png](#)

---

Mary Parkin and Heather Bell added comments and suggestions to [2015 10 27 Lynx SSA Expert Elicitation Workshop - Notes - JShoemaker.docx](#)

---



**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open

---



**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open

---



**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open

---



**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open



**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open



**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open



**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open



**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open



**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open



**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

Reply

Open



**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

Reply

Open



**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

[Reply](#) [Open](#)

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**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

[Reply](#) [Open](#)

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**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

[Reply](#) [Open](#)

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**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

[Reply](#) [Open](#)

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**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

Reply

Open

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open

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**Mark McCollough**  
Made a comment



**Mary Parkin**  
*Marked as resolved*

Reply

Open

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**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

Reply

Open

---



**Mark McCollough**  
Made a comment



**Mary Parkin**  
*Marked as resolved*

Reply

Open



**Mark McCollough**  
Made a comment



**Mary Parkin**  
*Marked as resolved*

Reply

Open



**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open



**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open



**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

Reply

Open



**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

Reply

Open



**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

Reply

Open



**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

Reply

Open



**Mark McCollough**  
Made a comment



**Heather Bell**  
*Marked as resolved*

Reply

Open

**Mark McCollough**  
Made a comment





**Heather Bell**

*Marked as resolved*

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**From:** [Mary Parkin \(Google Docs\)](#)  
**To:** [mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)  
**Subject:** 2015 10 27 Lynx SSA Expert Elicitation Workshop - Notes - ...  
**Date:** Thursday, November 12, 2015 12:27:25 PM  
**Attachments:** [logo.png](#)

---

Mary Parkin added suggestions to [2015 10 27 Lynx SSA Expert Elicitation Workshop - Notes - JShoemaker.docx](#)

---



**Mark McCollough**  
Made a suggestion



**Mary Parkin**  
*Accepted suggestion*

Reply

Open

---



**Mark McCollough**  
Made a suggestion



**Mary Parkin**  
*Accepted suggestion*

Reply

Open

---



**Mark McCollough**  
Made a suggestion



**Mary Parkin**  
*Accepted suggestion*

Reply

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---



**Mark McCollough**  
Made a suggestion



**Mary Parkin**

*Accepted suggestion*

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**From:** [Heather Bell \(Google Docs\)](#)  
**To:** [mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)  
**Subject:** 2015 10 27 Lynx S... - Made a suggestion  
**Date:** Thursday, November 12, 2015 12:58:44 PM  
**Attachments:** [logo.png](#)

---

Heather Bell replied to a suggestion on [2015 10 27 Lynx SSA Expert Elicitation Workshop - Notes - JShoemaker.docx](#)

---



**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

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**From:** [Heather Bell \(Google Docs\)](#)  
**To:** [mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)  
**Subject:** 2015 10 27 Lynx SSA Expert Elicitation Workshop - Notes - ...  
**Date:** Thursday, November 12, 2015 1:22:27 PM  
**Attachments:** [logo.png](#)

---

Heather Bell added suggestions to [2015 10 27 Lynx SSA Expert Elicitation Workshop - Notes - JShoemaker.docx](#)

---



**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

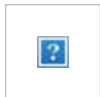
Reply

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

Reply

Open

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

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**Mark McCollough**  
Made a suggestion



**Heather Bell**  
*Accepted suggestion*

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## CANADA LYNX ROAD KILLS NATIONALLY

One reported road kill in Idaho from 1972, which occurred on Highway 12 near Noseeum Creek. Traffic volume on this road in the year 2000, was approximately 600 vehicles per day. Therefore traffic volume in 1972 was likely much lower (Bryon Holt, pers comm. 2007).

| COLORADO ROAD MORTALITIES SINCE 1999 (16) SINCE REINTRODUCTION |            |                                                      |                       |
|----------------------------------------------------------------|------------|------------------------------------------------------|-----------------------|
| Lynx                                                           | Date       | General Location                                     | Traffic Volume (AADT) |
| AK99F17                                                        | 7/22/1999  | Wolf Creek Pass area<br>Highway 160 MP 172-172.5     | 2,325                 |
| BC99F6                                                         | 7/19/1999  | U.S 550 South of Montrose<br>MP 112.5                | 3,300-4,200           |
| BC00F5                                                         | 3/16/2002  | I-70 East of Eisenhower<br>Tunnel, Herman Gulch      | 27,600                |
| BC03F03                                                        | 5/19/2005  | I-70 2 miles west of Vail<br>Pass                    | APPROX. 20,000        |
| BC05M06                                                        | 7/29/2005  | Highway 550 S of Molas<br>Pass MP 48.5 near DMR      | 4,100                 |
| BC06M10                                                        | 8/15/2006  | I-80 near Elk Mountain, Wy                           | 10,400                |
| BC03F07                                                        | 7/25/2008  | US Hwy 9, south of Frisco,<br>CO                     |                       |
| CO04M14                                                        | 5/12/2005  | Hwy 17 near Horca, lynx<br>kitten ~ 11 months old    | 480-1,100             |
| CO04M12                                                        | 9/2/2012   | Highway 550, Red Mtn Pass,<br>MM-79                  |                       |
| QU04F04                                                        | 5/17/2004  | Vail Pass I-70                                       | 19,000                |
| QU04F05                                                        | 8/26/2005  | New Mexico (released in<br>Colorado)                 | UNKNOWN               |
| YK00F6                                                         | 8/17/2000  | I-70 MP 221 Bakerville                               | 24,730                |
| YK00F8                                                         | 12/22/2000 | Highway 550 Red Mtn Pass<br>MP 80.75, N of Silverton | 1,407                 |
| YK00M3                                                         | 9/30/2005  | Kansas (released in<br>Colorado)                     | UNKNOWN               |
| YK05M02                                                        | 8/6/2007   | Hopeville, Iowa                                      | UNKNOWN               |
| male                                                           | 6/28/2013  | Rifle, Colorado                                      |                       |
| Unknown                                                        | 2000       | New Mexico                                           | UNKNOWN               |

| MINNESOTA ROAD RELATED MORTALITY (6) |                                     |                      |             |                                  |
|--------------------------------------|-------------------------------------|----------------------|-------------|----------------------------------|
| Date                                 | Location                            | Traffic Volume (VPD) | Speed Limit | Highway                          |
| 07/02/2003                           | T64N R01E Sec 32, Cook County       | 1,350                | 40-60       | County Highway 12                |
| 08/01/2003                           | T156N R39W Sec 12, Marshall County  | 475                  | ?           | County Highway 54                |
| 07/16/2004                           | T62N R03E Sec 27, Cook County       | 2,250                | 55          | State Highway 61                 |
| 12/10/2004                           | T40N R21W Sec 15, Pine County       | 19,400               | 70          | Interstate 35                    |
| 04/20/2005                           | T59N R08W Sec 10, Lake County       | 19                   | 26-45       | FR 172                           |
| 03/03/2009                           | T51N R15W, Sec 31, St. Louis County | 11,700               | 65          | Federal (US No Trunk-HWY) Forest |



**MAINE ROAD RELATED MORTALITY (24)**

| <b>Date</b> | <b>Township</b>      | <b>Location</b>                                                | <b>Type of road</b>                         | <b>Road Speed</b> | <b>Traffic volume</b> |
|-------------|----------------------|----------------------------------------------------------------|---------------------------------------------|-------------------|-----------------------|
| 7/28/2000   | Portage              | ¼ mile in on West Cottage Road                                 | Secondary, dead-end, state/municipal, paved | <45 mph           | ? <200 vehicles/day   |
| 9/19/2002   | T17 R13 WELS         | Robichaud Road                                                 | Private, two-lane, gravel, forest haul road | 45-50 mph         | ? 200vehicles/day     |
| 8/19/2003   | T11 R12              | Realty Road (mi. 51)                                           | Private, two lane, gravel, forest haul road | 45-50 mph         | ?200-400 vehicles/day |
| 8/9/2004    | Nashville Plantation | Beaver Brook Road, 200 yards east of Rt. 11 intersection       | Private, two lane, gravel, forest haul road | 40 mph            | ? 50 vehicles/day     |
| 9/5/2004    | T13 R9 WELS          | Rocky Brook Road (mi. 21.5)                                    | Private, two lane, gravel, forest haul road | 40 mph            | ? 100 vehicles/day    |
| 10/5/2004   | T16 R13              | Estcourt (Irving Road) 1 mi. S. of Chementicook Stream         | Private, two lane, gravel, forest haul road | 45 mph            | ? 200 vehicles/day    |
| 6/20/2005   | T14 R7 WELS          | Wilderness Island Road (Near Ferguson Crossing)                | Private, two lane, gravel, forest haul road | 45 mph            | ? 200 vehicles/day    |
| 7/26/2005   | T13 R5 WELS          | Beaver Brook Road (~4 mi. E. of Rt. 11)                        | Private, two lane, gravel, forest haul road | 40 mph            | ? 100 vehicles/day    |
| 8/1/05      | T10 R9               | Jack Mountain Rd. (between mile 14 and 15)                     | Private, two lane, gravel, forest haul road | 40 mph            | ? 200 vehicles/day    |
| 2/13/06     | T16 R4               | Rt. 161 (near Madawaska L.)                                    | Primary, two-lane, paved, state highway     | 50 mph            | 1500 vehicles/day     |
| 9/1/2006    | T14 R8 WELS          | Mile 8, Wilderness Island Road                                 | Logging road, unpaved                       | 35 mph            | low                   |
| 9/21/2007   | Fort Kent            | Route 161 near St. John Bog                                    | State Highway, paved                        | 50 mph            | medium                |
| 9/30/2007   | Palmyra              | Route 2                                                        | State Highway, paved                        | 50 mph            | medium                |
| 10/6/2007   | T14 R15 WELS         | Maibec Road                                                    | Logging road, unpaved                       | 45                | low                   |
| 11/23/2007  | Medway               | I-95 2 miles south of Medway                                   | Paved interstate                            | 65                | High                  |
| 8/14/2008   | T14 R6 WELS          | Route 11, 1-2 miles north of townline                          | State Highway paved                         | 50                | Medium                |
| 10/8/2008   | Monticello           | Route 1                                                        | State Highway paved                         | 45                | medium                |
| 10/15/2008  | Island Falls         | I-95sb 0.5 mile north of Island Falls and Rt. 159 intersection | Interstate                                  | 65                | High                  |
| 6/16/2009   | Chapman              | Grendall Road                                                  | Town, paved                                 | 35                | low                   |
| 7/31/2009   | New Sweden           | Route 161, New Sweden, ME                                      | State highway paved                         | 45                | medium                |
| 10/22/2009  | Bridgewater          | US Route 1                                                     | State Highway paved                         | 50                | medium                |
| 11/3/2009   | T11 R10 WELS         | 40-mile Branch Road                                            | Logging                                     | 35                | low                   |

|           |                    |          |                       |    |                |
|-----------|--------------------|----------|-----------------------|----|----------------|
| 11/7/2010 | Town of Medway, ME | I-95     | Interstate            | 65 | Medium to high |
| 4/11/2011 | T17 R12            | 106 Road | Gravel, major logging | 50 | low            |

| <b>MONTANA ROAD RELATED MORTALITY (1)</b> |                     |                 |                     |                   |                            |
|-------------------------------------------|---------------------|-----------------|---------------------|-------------------|----------------------------|
| <b>Date</b>                               | <b>Township</b>     | <b>Location</b> | <b>Type of road</b> | <b>Road Speed</b> | <b>Traffic volume AADT</b> |
| 7/8/2003                                  | T9N, R6W, SW ¼ S. 3 | US Highway 12   | Paved highway       | 70 mph            | 3,000                      |

Information compiled by Mr. Kurt Broderdorp, Fish and Wildlife Biologist, US Fish and Wildlife Service. Updated 9-4-2014.

**From:** Kurt Broderdorp  
**To:** [Ann Belleman](#)  
**Subject:** RE: Lynx road and other mortality data  
**Date:** Monday, November 16, 2015 11:40:47 AM  
**Attachments:** [National Lynx road kills 2014.doc](#)  
[smaller VWCBO13.pdf](#)

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Hi Ann, Sounds like you got a tiger by the tail. I do not have any mining specific BOs that address lynx, we just don't have big open pit mines here within lynx habitat. I am in the process of updating my national road-kill data, but attached my latest version. I hope to have the 2015 update soon. My best sources of literature on movement barriers are from Road Ecology (Richard T.T. Forman et al. 2003), and Corridor Ecology (Jodi A. Hilty et al. 2006). These are both soft cover books in our collection. In addition, I have attached a BO for a private land development (subsequent to a USFS land exchange) The may help you address barriers to movement from highways as well as the private land development. The development would likely be similar to mining activity in the sense of intense human presence. Although, I think your scale may be somewhat larger. The BO also has some additional references that may help. I have all of them electronically, except for the corridor ecology chapters. Let me know if there is anything else I can help with.

Kurt Broderdorp  
US Fish and Wildlife Service  
(970) 628-7186

**From:** Belleman, Ann [mailto:[ann\\_belleman@fws.gov](mailto:ann_belleman@fws.gov)]  
**Sent:** Monday, November 16, 2015 9:49 AM  
**To:** Kurt Broderdorp  
**Subject:** Lynx road and other mortality data

Hi Kurt,

Hope you're doing well and guessing you're swamped with major projects as usual. I have a few questions for you ... I was handed a controversial open pit mining project in N Minn. last month, which has been in the planning stages for at least 7 years and I have to complete a draft BO by X-Mas. I'm wondering if:

- 1) you have any mining-related BOs for LAA to lynx (so I can look at your effects section; I created a table but want to see if I've missed any potential effects);
- 2) you can share your info on lynx road/vehicle-related mortalities in U.S. (Tam S. only keeps a database of roadkills in MN); and
- 3) you know of specific literature - off the top of your head - that addresses barriers to movement?

About the last item - I have a bunch of Squires papers, of which at least one addresses least cost paths and movement corridors on more of a landscape scale (Squires et al. 2013), but I vaguely remember hearing or reading about a subdivision in NW MT where a collared lynx was found to travel all the way around it rather than through it to get to the other side. Obviously small sample size but interesting nonetheless. I know connectivity is not the issue in N MN that it is in the west, but what I want to address is the analogy of death by 1,000 cuts

- where you create an expanded barrier to such a point that lynx will no longer move through the area but completely around it to get to the other side.

I'd be happy to discuss. Anyway - if you have any info - great. If not, then thanks for reading!

- Ann

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**From:** [Zelenak, Jim](#)  
**To:** [McCollough, Mark](#)  
**Subject:** Re: SSA work this week  
**Date:** Monday, November 16, 2015 1:00:42 PM

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I'm not sure Mark. If you can work on it without that information having been pulled over, then go ahead. You can also take a look at the cardinal questions table and pull over some of the info you already provided there - you will just need to make a note for Mary that you are moving or have moved that stuff already so she doesn't duplicate it unnecessarily.

I have not been able to spend any more time on the SSA since we talked last week - still trying to get the lawsuit stuff dealt with, and need to get back to that now.

Thanks for keeping after the SSA work - hope I can do the same soon.

On Mon, Nov 16, 2015 at 12:25 PM, McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)> wrote:

Jim:

I wanted to work on the Excel table this afternoon, but saw that it has not been populated with information from our "critical questions."

Do you want us to wait for the tables to be populated first before we begin to individually review and edit the table?

Thanks, Mark

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**From:** [Smith, Tamara](#)  
**To:** [Zelenak, Jim](#)  
**Subject:** Re: please remind me...  
**Date:** Monday, November 16, 2015 3:17:06 PM

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Ha ha! Okay - I'll just chill until I hear from you. I won't be able to do much this week anyway.

Take care!  
-Tam

On Mon, Nov 16, 2015 at 2:51 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

I've had this question from you, Mark and Kurt - and I'm confused, too! I haven't finished the lawsuit stuff yet - but hope to very soon so I can get back to the SSA work.

Yes, I think Mary was going to take some of the info from the cardinal questions doc and move it to the Excel sheets. I told Mark he could move some of his stuff if he didn't want to wait for Mary to move it, but that he would need to make a note for Mary to avoid duplication. You could do the same.

I'm not sure about tasks/timelines beyond trying to get the excel sheets populated as soon as we can. We will discuss on the call tomorrow (my Monday call with Mary and Heather was cancelled today - by them, though I was grateful...), and if you can't make the call, I will follow up via email to let you know where things stand.

Sorry I can't be more helpful at the moment.

On Mon, Nov 16, 2015 at 1:25 PM, Smith, Tamara <[tamara\\_smith@fws.gov](mailto:tamara_smith@fws.gov)> wrote:

Hi Jim -

Can you remind me of the core-team's immediate tasks and the timeline for completion?

I know we were first waiting for Mary to do some initial work on the needs xls and that we were to start work on the other tabs - but I can't remember which one!

I'm out most of the rest of this week and will be in Mon & Tues next week.

Thanks,  
Tam

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**From:** [McCollough, Mark](#)  
**To:** [Zelenak, Jim](#)  
**Subject:** Re: Clarification  
**Date:** Tuesday, November 17, 2015 8:34:27 AM

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Thanks Jim. I am wrapping up work on the spread sheet "individual" and "population" tabs. If you have a chance, let me know if this is too much or not enough detail.

Sorry, but I am not well-versed on how to work with these Google Docs tables.

Mark

On Tue, Nov 17, 2015 at 10:32 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

In separate emails, I may have indicated to some of the Core Team that we would be discussing assignments/due dates on the Core Team call today. I realized later that on our last call we decided to go back from weekly to biweekly (2nd and 4th Tuesdays of each month, but now starting at 09:30 AM Mountain Time instead of 10:00) calls, which means we don't have a call today. Next call will be next Tuesday, Nov. 24, 09:30, though I'll likely be talking with some of you before then.

Thanks. Don't hesitate to call or email if you have questions.

Jim

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**From:** [McCollough, Mark](#)  
**To:** [Zelenak, Jim](#)  
**Subject:** Re: FIA?  
**Date:** Thursday, November 19, 2015 1:09:39 PM

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Yes, it relates to the Forest Inventory and Analysis - a national program of the US Forest Service. See <http://www.fia.fs.fed.us/>

There are hundreds of permanent plot locations in Maine that are measured periodically. The data are used to monitor forest growth and health. I assume there is a similar system in every state, but not sure...

Mark

On Thu, Nov 19, 2015 at 2:58 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

In the Workshop notes, Jenn V. referred to "FIA data" - in my notes, I have "Forest Inventory data, which does not capture the "A" in FIA. Any idea? Was there a "Forest Inventory Act" in Maine? "Assessment"? "Adage"? "Adagio"? "Arpeggio"? "Aria"?

Sorry - not even Friday and I'm losing it....

Appreciate any help.

--

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**From:** [McCollough, Mark](#)  
**To:** [Zelenak, Jim](#)  
**Subject:** Re: FIA?  
**Date:** Thursday, November 19, 2015 3:09:36 PM

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Appreciate any help.

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## Canada Lynx

### Background

The historic range of Canada lynx extended from Alaska across much of Canada, with southern extensions into parts of the western United States, the Great Lakes states, and New England (McKelvey et al. 1999; Ruediger et al. 2000). The USFWS listed the Canada lynx contiguous U.S. distinct population segment in March 2000 as threatened in the contiguous United States (FDR Vol. 65, No.58).

### Habitat Requirements

Canada lynx inhabit high elevation boreal or coniferous forest areas with “cold, snowy winters” (Ruediger et al. 2000). The preferred habitat of the lynx in the western U.S. is the Rocky Mountain conifer forest dominated by lodgepole pine, subalpine fir, and Engelmann spruce at an elevation above 6,500 feet (McKelvey et al. 1999; Ruediger et al. 2000). Home range size varies considerably and is usually dependent upon prey base availability. Lynx home ranges are large and have been reported to generally be between 12 to 83 square miles (FDR Vol. 74, No. 36, pg. 8616).

**Comment [NDB1]:** In Wyoming this is probably closer to 7200 feet and varies by aspect.

Key components of lynx habitat include denning and foraging habitat, and travel corridors (linkages) provided by a mosaic of forest habitats (Ruggiero et al. 1994). Lynx denning habitat is found in boreal forests with high horizontal cover provided by coarse woody debris (downed logs) (Ruggiero et al. 1994; Ruediger et al. 2000).

Snowshoe hares (*Lepus americanus*) are the primary prey species for lynx and the distribution of lynx coincides closely with that of snowshoe hares. Red squirrels (*Tamiasciurus hudsonicus*) are considered an important alternate prey species.

Lynx foraging habitat is closely associated with the habitat requirements of the snowshoe hare. Snowshoe hare are known to be associated with dense understory shrub and sapling habitats (Ruggiero et al. 1994). However, research in the Wyoming Range and other places has indicated that all forest types with a significant spruce/fir understory component, as well as regenerating (30-70 year old) lodgepole pine, are important as snowshoe hare habitat (Berg et al. 2010); Ellsworth and Reynolds 2006). Berg (pers. comm., 2008) has also documented snowshoe hares in sagebrush habitats up to 100-meters from forested habitat and within riparian willow corridors.

Travel corridors/linkages provide for lynx movement and dispersal. Documented daily movement distances have varied from 1.6 miles to 3.2 miles depending upon prey densities. Exploratory movements, usually in summer months and outside of identified home range boundaries, have been recorded at over 100 miles (Squires et al. 2003) and up to 600 miles (Ruediger et al. 2000). When necessary, lynx will cross non-forested habitats. However, in general, open areas, whether man-made or natural, will discourage use by lynx and disrupt their movements (Ruggiero et al. 1994). Most vegetation successional stages serve as travel cover, provided they offer adequate vegetative cover. Narrow forested mountain ridges or plateaus may provide a linkage between more extensive areas of lynx habitat. Wooded riparian communities may provide travel cover across otherwise open valley floors between mountain ranges. Linkages may be provided by forest stringers that connect large forested areas, or by low, forested passes that connect subalpine forests on opposite sides of a mountain range (Ruediger et al. 2000).

### **Management Direction Specific to Lynx**

The contiguous U.S. Canada lynx distinct population segment was listed as threatened primarily due to the inadequacy of existing regulatory mechanisms, specifically the lack of guidance for conservation of lynx and lynx habitat in the National Forest Land and Resource Management Plans and the BLM Land Use Plans (FDR Vol. 65, No.58). In 2000, an interagency team composed of representatives from the USFS, USFWS, BLM, and National Park Service (NPS) developed the Canada Lynx Conservation Assessment and Strategy (Ruediger et al. 2000), based on a comprehensive compendium on lynx ecology (Chapter 1, pgs. 5-19, Ruggiero and McKelvey 2000). The intent of this document was to provide a consistent and effective approach to conserving Canada lynx on Federal lands. Since 2000, most National Forests have either revised or amended their Forest Plans to include or incorporate the conservation measures outlined in the Canada Lynx Conservation Assessment and Strategy. The BTNF Plan was amended in 2007 and Canada lynx on the BTNF are now managed according to the Northern Rockies Lynx Management Direction (USFS 2007a).

### **Risk Factors Associated with Lynx Management Direction**

The Canada Lynx Conservation Assessment and Strategy identified more specific risk factors related to the inadequacy of existing regulatory mechanisms. The following risk factors are relevant to this analysis and the current condition of the habitat for lynx.

Risk Factors Affecting Survival, Movement, and Productivity:

- Conversion or alteration of native plant communities (timber harvest);
- Fuels management (wildland fire and fire suppression);
- Forest/backcountry roads and trails;
- Trapping;
- Incidental or illegal Shooting;
- Competition and predation;
- Private land development;
- Industrial development (oil and gas leases, mines, reservoirs).

Other risk factors which were not considered relevant to this analysis included highways and associated developments, predator control activities, ski areas and large resorts, and livestock grazing.

### **Issues Associated with the Relevant Risk Factors**

Conversion of native plant communities may result in effects to prey species and alter the abundance and/or availability of denning habitat. High quality snowshoe hare habitat can be patchy and temporal, thus “lynx populations require large boreal forest landscapes to ensure the sufficient high quality snowshoe hare habitat is available and to ensure that lynx may move freely among patches of suitable habitat” (FDR Vol. 74, No. 36 pg. 8616). Loss/alteration of habitat can occur through fire, natural events, vegetation management, and developments.

Forest roads and trails in general, are not considered a primary threat to resident lynx populations in and of themselves (USFWS 2007a). Vehicle speeds on forest roads are relatively slow in comparison to highways or other public roads due to topography, substrate and road conditions. Thus, the potential for lynx mortality or injury due to collisions with vehicles is probably low on forest roads. Lynx have not been found to have any preference for or avoidance of unpaved roads and existing road density has not been shown to affect lynx habitat selection (McKelvey et al. 2000 pg. 334). However, roads may increase the risk of trapping, and incidental/illegal shooting (Koehler and Britnell 1990 as cited in Aubry et al. 2000b pg. 391; Squires, pers. comm. 2010; USFWS 2007a, pg. 50), facilitate competition/predation, and affect denning behavior. The current open and closed roads

and winter access in the project area are displayed in Figures 3.18 and 3.19. Open road densities in the project area are displayed in Table 3.33.

Open roads may increase the vulnerability of lynx to human caused mortality (Ruediger et al. 2000 pg. 2-13). Lynx could be especially vulnerable to collision caused mortality considering that they don't seem hesitant to cross even highways during their travels. From 1999–2001, a male Canada lynx was found to have crossed several two-lane highways, one was crossed at least four times, during yearly exploratory movements from his home range in the Wyoming Range, across the greater Yellowstone area. This male lynx followed a similar path each year from the Wyoming Range near Big Piney, Wyoming, to as far as the Henry's Lake Mountains, west of West Yellowstone, Montana (Squires and Oakleaf, 2005).

The Biological Opinion for the Northern Rockies Lynx Management Direction (USFWS 2007a, pg. 50) states that, "Human access via Forest roads can increase the potential for mortality or injury of lynx captured incidentally in traps aimed at other species or through illegal shooting". Lynx can be unwary at times and may allow individual people to approach within close range, making them particularly susceptible to being illegally shot (Squires, pers. comm. 2008). Poached lynx are often found in proximity to open roads (Squires, pers. comm. 2010). In Montana, of 49 recorded lynx mortalities, 18 percent were attributed to trapping or shooting (Squires et al. 2006 as cited in USFWS 2007a). Seven of the lynx reintroduced to Colorado between 1999 and 2003 were illegally shot (CDOW 2004 as cited in Meaney and Beauvais 2004) and recent information documents that 30 percent of the 98 mortalities of these reintroduced lynx were related to collisions with vehicles and gunshots (CDOW 2008).

It has been hypothesized that roads and compacted snow routes may negatively impact Canada lynx through facilitating the movement of competing carnivores, primarily coyotes, and predators, such as mountain lions, along snow compacted routes into lynx habitat during winter (Ruediger et al. 2000 pg. 2-12 and Aubry et al. 2000a pg. 461), likely contributing to lynx starvation and reduced recruitment. Lynx are believed to have a competitive advantage in deep snow due their very large feet in relation to their body mass. Deep, fluffy snow conditions are thought to restrict the movement of competitors, such as bobcat or coyote that would otherwise encroach on winter snowshoe hare habitats (FDR Vol. 74, No. 36). Research on this topic has resulted in varying results. The USFWS Final Rule listing the lynx (FDR Vol. 65, No. 58) concluded that there is currently no evidence that compacted snow trails are negatively affecting lynx at the population-level scale by facilitating competition from coyotes, bobcats, or mountain lions (USFWS 2007a) and that "research has provided no conclusive evidence that snow compacted routes adversely affect lynx or their habitats..." (Ibid.).

Kolbe (et al. 2007) is the most referenced and rigorous study supporting this assumption, that compacted snow routes do not increase access for lynx competitors. Kolbe (et al. 2007) concluded that compacted snow routes did not seem to influence prey competition with coyotes in deep snow areas within their study area. Within lynx habitat in northwestern Montana, twelve radio-collared coyotes were monitored over three winter seasons to assess how coyotes interacted with compacted snowmobile trails (Kolbe et al. 2007). Coyotes remained in lynx habitat having deep snow conditions and traveled on compacted snowmobile trails more than random expectations. However, coyotes used compacted snowmobile trails for less than eight percent of their travel and used compacted and uncompacted roads similarly (Kolbe et al. 2007). Coyotes did strongly select for shallower and more supportive snow surfaces when traveling off of compacted trails. In this study, coyotes primarily scavenged ungulate carrion that was readily available during winter months, while snowshoe hare kills comprised only three percent of coyote feeding sites (Kolbe et al. 2007). It is important to note that in Kolbe (et al. 2007), the study area was characterized by the presence of abundant ungulate carrion in the winter, primarily related to hunters. This characteristic may be a rather unique occurrence within lynx habitat in northwestern Montana and may not occur within other portions of lynx habitat. In addition, geographic variation in snow conditions (i.e., depth,

**Comment [NDB2]:** Lynx on Togwotee Pass commonly crossed the highway before highway expansion and clearing of trees on the road edge. One lynx in particular would actually walk up and down the road and bed down in the thickets of small trees just off the highway. I think we documented this in our EWR Greater Yellowstone Lynx Study annual reports.

**Comment [NDB3]:** A study on this subject was completed recently on Togwotee Pass. Jenny Burghardt, Eric Gese and John Squires conducted the study. It was Jenny's Masters project at Utah State University. It was an extensive study. You can find a copy of the thesis here: <http://digitalcommons.usu.edu/etd/779/>

**Comment [NDB4]:** Jenny Burghardt's study used the same methods as Kolbe et al. 2007 and came up with very different results. It seems that snow type (how supportable the snow is) plays a role in how much coyotes use snow compacted trails. In Wyoming on the BTNF coyotes used compacted trails a lot. See thesis above...

supportiveness) may account for differences in coyote use of compacted snow trails documented in this study. Consequently, the effects of snow-compacting winter recreation activities on lynx may be dependent upon the environmental conditions which can vary with location.

Other reports and anecdotal observations have documented coyotes using high elevation, deep snow areas (Buskirk et al. 2000). Research conducted in central Alberta, attributed the use of more open habitats by coyotes to greater snow compaction (Todd et al. 1981). In another study in Alberta, coyotes were more selective of hard or shallow snow conditions than lynx (Murray et al. 1994). In the Uinta Mountains of northeastern Utah and in an additional three comparative study areas (Bear River range in Utah and Idaho, Targhee National Forest in Idaho, Bighorn National Forest in Wyoming), Bunnell et al. (2006) found that the presence of snowmobile trails was a highly significant predictor of coyote activity in deep snow areas. From track surveys it was determined that the vast majority of coyotes (90 percent) stayed within 350 meters of a compacted trail and that snow depth and prey density estimates (snowshoe hares and red squirrels) were the most significant variable in determining whether a coyote returned to a snowmobile trail (Bunnell et al. 2006). Of these four study areas, recent lynx presence has only been documented on the Targhee National Forest.

Comment [NDB5]: Jenny's results were similar to Bunnell.

Recent research in the Togwotee Pass area also indicates that coyotes utilize compacted snow trails more than expected. The thesis is currently being finalized and not available for distribution. However, according to the author, Burghardt (unpublished data 2010), the general findings of this research indicate that “coyotes used trails compacted by snowmobiles significantly more than expected (mean use = 34.5 percent), and more than random availability on the landscape (which ultimately means they’re not only using them, but specifically targeting them) in northwestern Wyoming”. Additionally, coyote backtracking indicated that there was a relationship between coyote winter movements and snowmobile trails (Ibid.). There was an “increase in coyote tracks (compared to 9 other predators) on groomed trails throughout the study area as snow depth increased, and a positive relationship between the percentage of compacted surface area and coyote use of compacted trails when backtracking known individuals (Ibid.)”. Whether this relationship facilitates use of deep snow habitats or competition between lynx and coyotes could not be determined from this study because dietary overlap between coyotes and lynx, during the winter was not found (Ibid.). (Snowshoe hare did account for 25 percent of all coyote fall diets (Ibid). The findings do not rule out snow compaction contributing to competition with coyotes but they do not lend any evidence (Burghardt unpublished data 2010). Other forms of competition such as habitat and niche use or avoidance behaviors were not assessed. Numerous studies have shown that coyotes regularly prey on snowshoe hares, to the point of their population dynamics being controlled by hare abundance in northern areas (Prugh 2005; O’Donoghue et al. 1997). Coyotes are also known to rely and concentrate/specialize on various prey species depending on availability (Prugh 2005; Randa et al. 2009).

Comment [NDB6]: Oh...I see that you have this info. Thesis is finalized and online..

The snow column “supportiveness” in the Togwotee Pass study area would be similar to that of the project area. The combination of Burghardt’s findings and the evidence presented by Bunnell (et al. 2006), Buskirk (et al. 2000) and others favor the conclusion that snow compaction facilitates competitor/predator movement at least in areas where the snow column tends to be unsupportive unless compacted. However, there is little evidence at this point to support the contention that compacted snow routes increase prey competition, at least with coyotes, although the routes seem to provide access in areas where the snow column is not supportive.

It has been postulated that summer use of roads and trails through denning habitat may have negative effects. Ruggiero (et al. pg. 453) suggested that “disturbance at den sites could increase the vulnerability of kittens to a variety of threats”. Additionally, lynx den sites are selected in late winter/early spring when roads would typically be largely unavailable due to snow conditions (Squires et al. 2007). Squires (et al. 2007 pg. 1505) found that, “[l]ynx denned farther from all roads compared to random expectation”, but this was believed to be “a function of how roads correlated to

landscape pattern...rather than a response to human disturbance”. Therefore, it remains unclear whether roads/trails or other developments and activities affect lynx den selection and/or behavior of denning lynx.

Other human developments including oil and gas exploration and development may affect lynx by changing or eliminating vegetation and contributing to fragmentation (Ruediger et al. 2000). Surface use associated with exploration and development that results in temporary to long-term removal of vegetation may also cause “an increased potential for human-caused mortality” (Ibid. pg. 2-14). The “greatest impact is likely the development of road access” resulting in compacted snow routes (i.e. access for competing predators) and increased vulnerability to incidental trapping mortality (Ruediger et al. 2000).

Direct research on lynx response to oil and gas development is not available. Nevertheless, information is available related to other types of human activities and the impacts on lynx. Specific data for a certain species, area, or activity is often unavailable. However, information that is known can often be used to correlate the possible impacts, where site or activity-specific information is lacking.

According to the Canada Lynx Conservation Assessment and Strategy, human presence for the most part has not been shown to impact lynx habitat use (Aubry 2000 as cited in Ruediger et al. 2000). However, an exception to this may be activities around den sites (Ruediger et al. 2000; Ruggiero et al. 2000 pg. 453; Oakleaf, pers. comm. 2009) as previously discussed related to roads and trails. Additionally, individual lynx may have different responses depending on other factors (various sources as cited in Ruediger et al. 2000 pg. 2-9) and a threshold may exist “where human disturbance becomes so intense that it precludes use of an area by lynx” (Ibid. pg. 2-9). Factors that may influence the effects of an activity on individual lynx include time of year/day, type and pattern of the activity, and intensity and frequency (Ibid.).

According to Ruggiero (et al. 2000 pg. 453), “...limited anecdotal observations do not support the hypothesis that snowmobiling, ski touring, or hiking result in significant behavioral disturbance to lynx...” McKelvey (et al. 2000 pg. 334) found that “narrow, forest roads at the relatively low densities that characterized the study area”, did not appear to affect lynx habitat use. Railroad corridors, relatively wide utility corridors, and heavily used highways can impede lynx movement and contribute to habitat fragmentation (various authors as cited in Ruediger et al. 2000 pgs. 2-17 and 2-18). There is also little evidence of lynx using portions of highly developed ski areas (such as near the base, where private developments are concentrated) (Ibid pg. 2-19 and USFWS 2007a). Additionally, although lynx may be tolerant of ski resort grooming activities (Roe et al. 1999 as cited in Ruediger et al. 2000 pp 2-19), activities outside of normal operating hours may induce a different response from lynx. Thus, there may be a certain level, pattern, or intensity of disturbance that would affect lynx behavior or habitat use.

### **Northern Rockies Lynx Management Direction**

The Northern Rockies Lynx Management Direction provides guidance for oil and gas leasing, under “All Management Practices and Activities (ALL)” and “Human Use Projects (HU)” (USFS 2007a). Direction for the three other activity categories addressed in the lynx amendment, “Vegetation Management and Practices” and “Livestock Management”, do not apply to oil and gas leasing (USFS 2007a).

Vegetation management is typically the focus of the effects analysis for lynx because “the primary factors driving lynx populations, behavior and distribution is the abundance and distribution of snowshoe hare prey” (USFWS 2007a). The Vegetation Management and Practices guidance in the Northern Rockies Lynx Management Direction does not apply to the proposed oil and gas development because it is not a vegetation management project. This does not mean that oil and gas

development does not affect vegetation and thus potentially habitat. The amount of vegetation altered or removed is relatively small compared to typical vegetation management projects. Additionally, the vegetation removed for oil and gas infrastructure is gone long-term (at least several decades). The Northern Rockies Lynx Management Direction defines “permanent” development as greater than 15 years. This is quite different from vegetation management projects that are completed within a few years or less and the affected area begins to progress from a lower or different succession level and eventually returns to useable habitat. Oil and gas development may affect some lynx habitat but not to the same extent or purpose as a vegetation management project.

The Northern Rockies Lynx Management Direction does provide guidance for activities and developments that are not for the purpose of managing vegetation but have the potential for affecting lynx (Figure 3.20). The following table displays the relevant direction provided by this document. The terms of this management direction are defined as the following:

- Goals, which are general descriptions of desired results;
- Objectives, which are descriptions of desired resource conditions;
- Standards, which are management requirements designed to meet the objectives; and
- Guidelines, which are management actions normally taken to meet the objectives.

The USFWS Biological Opinion on the Northern Rockies Lynx Management Direction assumes that guidelines would be adhered to in most cases except where there are compelling reasons, such as public safety or risks to other species (USFWS 2007a).

#### **Relevant Direction from Northern Rockies Lynx Management Direction**

- ✓ **Objective ALL O1:** Maintain or restore lynx habitat connectivity in and between LAUs, and in linkage areas.
- ✓ **Standard ALL S1:** New or expanded permanent development and vegetation management projects must maintain habitat connectivity in a Lynx Analysis Unit and/or linkage areas. (Permanent development equals greater than 15 years.)
- ✓ **Objective HU O1:** Maintain the lynx’s natural competitive advantage over the other predators in deep snow, by discouraging the expansion of snow-compacting activities in lynx habitat.
- ✓ **Objective HU O3:** Concentrate activities in existing developed areas, rather than developing new areas in lynx habitat.
- ✓ **Objective HU O5:** Manage human activities, such as special uses, mineral and oil and gas exploration and development, and placement of utility transmission corridors, to reduce impacts on lynx and lynx habitat.
- ✓ **Guideline HU G4:** For mineral and energy development sites and facilities, remote monitoring should be encouraged to reduce snow compaction.
- ✓ **Guideline HU G6:** Methods to avoid or reduce effects on lynx should be used in lynx habitat when upgrading unpaved roads to maintenance levels 4 or 5, if the result would be increased traffic speeds and volumes, or a foreseeable contribution to increases in human activity or development.
- ✓ **Guideline HU G7:** New permanent roads should not be built on ridge-tops and saddles, or



in areas identified as important for lynx habitat connectivity. New permanent roads and trails should be situated away from forested stringers.

- ✓ **Guideline HU G8:** Cutting brush along low-speed, low traffic volume roads should be done to the minimum level necessary to provide for public safety.
- ✓ **Guideline HU G9:** On new roads built for projects, public motorized use should be restricted. Effective closures should be provided in road designs. When the project is over, these roads should be reclaimed or decommissioned, if not needed for other management objective.

It should be noted that adherence to this management direction does not in all cases prevent adverse effects to individual lynx, although such adverse effects may not “negatively affect the lynx distinct population segment” (USFWS 2007a). The goal of the Northern Rockies Lynx Management Direction was to “Conserve the Canada Lynx” (USFS 2007a) and the FEIS Record of Decision states that the direction “contributes to the conservation and recovery of Canada lynx in the Northern Rockies ecosystem” (USFS 2007a). The Purpose and Need for incorporating the Northern Rockies Lynx Management Direction was to reduce or eliminate “adverse effects from land management activities on National Forest System lands, while preserving the overall multiple-use direction in existing plans” (USFS 2007a). This goal applies to the contiguous U.S. distinct population segment and the Northern Rockies Lynx Management Direction was applied to nine entire National Forests, including the BTNF and portions of four other Forests. This direction, therefore, promotes conservation of the contiguous U.S. lynx distinct population segment but it does not prevent adverse effects to individual lynx. The Biological Opinion acknowledges that “where we determined in our finding that certain risk factors did not negatively affect the lynx distinct population segment, the risks may impart adverse [e]ffects to individual lynx depending upon site specific conditions” (USFWS 2007a).

The USFWS has identified the BTNF as “occupied” by lynx (USFS and USFWS 2006). A national forest is considered “occupied” if it has had “at least two verified lynx observations or records [of non-transitory lynx] since 1999” and if there is “evidence of lynx reproduction on the national forest” (Ibid.). The BTNF is also identified in the “Recovery Outline” (USFWS 2005) as a “core” area, which is defined as an area with the strongest long-term evidence of persistence of lynx populations (USFWS 2005). The Recovery Outline serves as an “interim strategy to guide recovery efforts until a final recovery plan is completed” (USFWS 2007a).

### **Habitat/Species Presence in the Project Area**

The presence of Canada lynx in the Wyoming Range has been well documented both historically and recently (Meaney and Beauvis 2004; Squires et al. 2003; McKelvey 2000; Oakleaf 1997; Reeve et.al. 1986). The Wyoming Range is unique and indicative of the boreal forest habitat required by lynx. Although few data are available, researchers believe that lynx in the Greater Yellowstone Ecosystem have a patchy distribution and the Wyoming Range may represent some of the most important lynx habitat in this ecosystem (Squires, pers. comm. 2008; Berg, pers. comm. 2008). This area is considered some of the most essential habitat in Wyoming, both historically and currently (Oakleaf, pers. comm. 2008). This belief is based on the historic abundance of lynx in the area, known den sites, snowshoe hare abundance, and continuous documentation of lynx presence. The Wyoming Range has the longest and most consistent lynx occupancy in the state (Squires, pers. comm. 2010).

Reeve et.al. (1986) compiled historic records of lynx occurrence in the state of Wyoming ( from 1856 to 1986); their search found 171 verifiable observation and trapping records, the majority of which were on the BTNF and immediate surrounding area. Lynx were present in Wyoming prehistorically and historically (Oakleaf 1998). A breeding population persisted in the Wyoming

Range during the 1970s. **After 18 lynx were legally trapped within a small area of the Wyoming Range (Horse Creek area north to the Hoback Rim) during a few months in 1972**, the State ended legal trapping of lynx in 1973 when they were designated as a “Species of Special Concern” (*Ibid*). The Horse Creek area is within the 44-7 project area.

WGFD trapped and radio collared one male lynx in 1996 and one female lynx in 1997 in the 44-7 project area (Oakleaf 1998). Both provided invaluable data regarding habitat use in the Wyoming range until 2001 after both expired. The male lynx of this pair occupied a home range of approximately 39 square miles (or 24,700 acres) in 1997 and 1998 but in 1999 used an area about ten times larger or 390 square miles (Squires et al. 2003). The female’s home range was smaller and averaged 19 square miles (12,400 acres) (*Ibid.*). The radio locations collected from this pair are spatially displayed in Figure 3.21a; the project area and immediately adjacent habitats, particularly in the northern lease block, were extensively used by both cats. The female produced four kittens in 1998 and two in 1999 (Squires and Laurion 2000). The natal and maternal den sites associated with this pair remain the only documented dens in Wyoming (Oakleaf, pers. comm. 2009). Both den sites were located within the Northern Lease Parcels of the proposed project (Figure 3.21a). Over 50 percent of the lynx records in Wyoming are associated with the project area (*Ibid.*).

There have been several documented locations of lynx in and near the project area in the last 15 years, the most recent of which was January and March of 2010 (Squires et al. 2003; EWR unpublished data 2008; EWR 2009; Patla, pers. comm. 2010; Fralick, pers. comm. 2010; Berg, pers. comm. 2010). The WGFD documented lynx tracks less than 3 miles west of the southern block of the project area in March 2009 (Spaeth, pers. comm. 2009) and a lynx was tracked in January and March of 2010 in the upper portions of a drainage less than 10 miles west of the southern portion of the project area (Patla, pers. comm. 2010). This lynx is believed to be from the Colorado reintroduction and remained in the general area for four months (Patla, pers. comm. 2010).

The project area and adjacent habitats have been located and used by reintroduced lynx dispersing from Colorado. Some of this use has been documented to be from the same lynx over multiple consecutive winters (Berg, pers. comm. 2009). The Colorado Division of Parks and Wildlife provided the BTNF with GPS collar data collected from lynx in their reintroduction effort that had migrated to and through Wyoming. Figure 3.22b spatially displays GPS locations of 10 lynx from Colorado that occurred on the BTNF and within the Wyoming Range at one time or another during 2004 to 2010. None of the collars have been “on the air” since 2010, and the status of these individuals is unknown.

Lynx surveys from 2004/2005 and as recent as 2007, were based on winter back-tracking and incorporated genetic analyses of DNA collected on tracks, detected lynx in the area from Horse Creek to the Hoback Rim (EWR unpublished data 2008). The presence of one or more lynx in and near the project area is remarkable considering that there may be less than 7 individuals in the entire Greater Yellowstone Ecosystem (Berg et al. 2005).

Past and present occurrence records, trapping records, and radio collar data all indicate the importance of the East Front of the Wyoming Range to lynx. And, the predominance of all lynx observations known for Wyoming occurred in the Wyoming Range in general and from the **East Front specifically**. The Wyoming Range provides habitat for the southern-most native population of lynx in the continental United States. As such, the area between Beaver Creek south including the drainages of Beaver Creek, Horse Creek, Cottonwood Creek, Piney Creek, La Barge Creek, to Fontenelle Creek south, and then east of Greys River to the prairie interface is critically important for maintaining lynx in this region (Squires personal communication to Ann Belleman 2009).

**Comment [NDB7]:** Headwaters of the Greys River and vicinity is good habitat also.

## Linkage Zones

In 2002, the Lynx Science Team, under the direction of the Lynx Steering Committee, identified several lynx linkage zones within the NRLMD planning area (USDA 2007a). Several were identified on the BTNF and within the Wyoming Range, and they are displayed in Figure 3.29. Linkage areas provide landscape connectivity between blocks of lynx habitat and occur both within and between geographic areas where blocks of lynx habitat are separated by intervening areas of non-lynx habitat such as basins, valleys, agricultural lands, or where lynx habitat naturally narrows between two blocks (*Ibid*). As is indicated by the preponderance of observation records and radio collar data from both the WGFD and the Colorado Division of Parks and Wildlife, the Wyoming Range is an important linkage corridor, and provides a linkage zone between lynx populations in the Northern and Southern Rocky Mountains; maintaining connectivity between these sub-populations may be critical to lynx recovery efforts.

Several sources (Berg, pers. comm. 2008; Squires et al. 2003; Squires 2006; and Oakleaf, pers. comm 2008), have identified the Hoback Rim, also referred to as “Bondurant Corridor”, as being an important linkage zone for lynx (Figure 3.21a, 3.21b). The corridor has been used by lynx on multiple occasions, as documented in Squires (et al. 2003) and Berg (et al. 2005), and connects the Wyoming Range to the Wind River, Gros Ventre and Teton Ranges to the North. The male collared lynx (Figure 3.29) engaged in yearly exploratory movements (1999 – 2001) across the Greater Yellowstone area that included the Teton Wilderness area and Yellowstone National Park. For three consecutive summers, the lynx traversed a similar path from the animal’s home range in the Wyoming Range to as far as the Henry’s Lake Mountains, west of West Yellowstone, Montana. During these movements, this male used the Hoback Rim corridor a minimum of four times (Squires et al. 2003). The vegetation in the “Bondurant corridor” as labeled by Squires can be described as “islands” of lodgepole pine and aspen that contrast markedly from the more open sagebrush/grassland surrounding the corridor (Ibid). The collared male was also documented using forested habitats to cross other highways in its movements through Wyoming (Ibid.) Lynx from the Colorado reintroduction have also been documented using this (Bondurant) corridor. Forest Road #10143 occurs in this corridor in the portion of the linkage that is within the project area. This linkage area has been described as a “bottleneck” (March 11, 2009, Level 1 Meeting) because of its relatively narrow topographic size and the documented use of it as a route to connect between the Wyoming Range and nearby mountain ranges.

**Comment [NDB8]:** There is a lot of subalpine fir in there too.

Figure 3.21(a): Wyoming Lynx Locations Relative to the Project Area: Source - WGFD

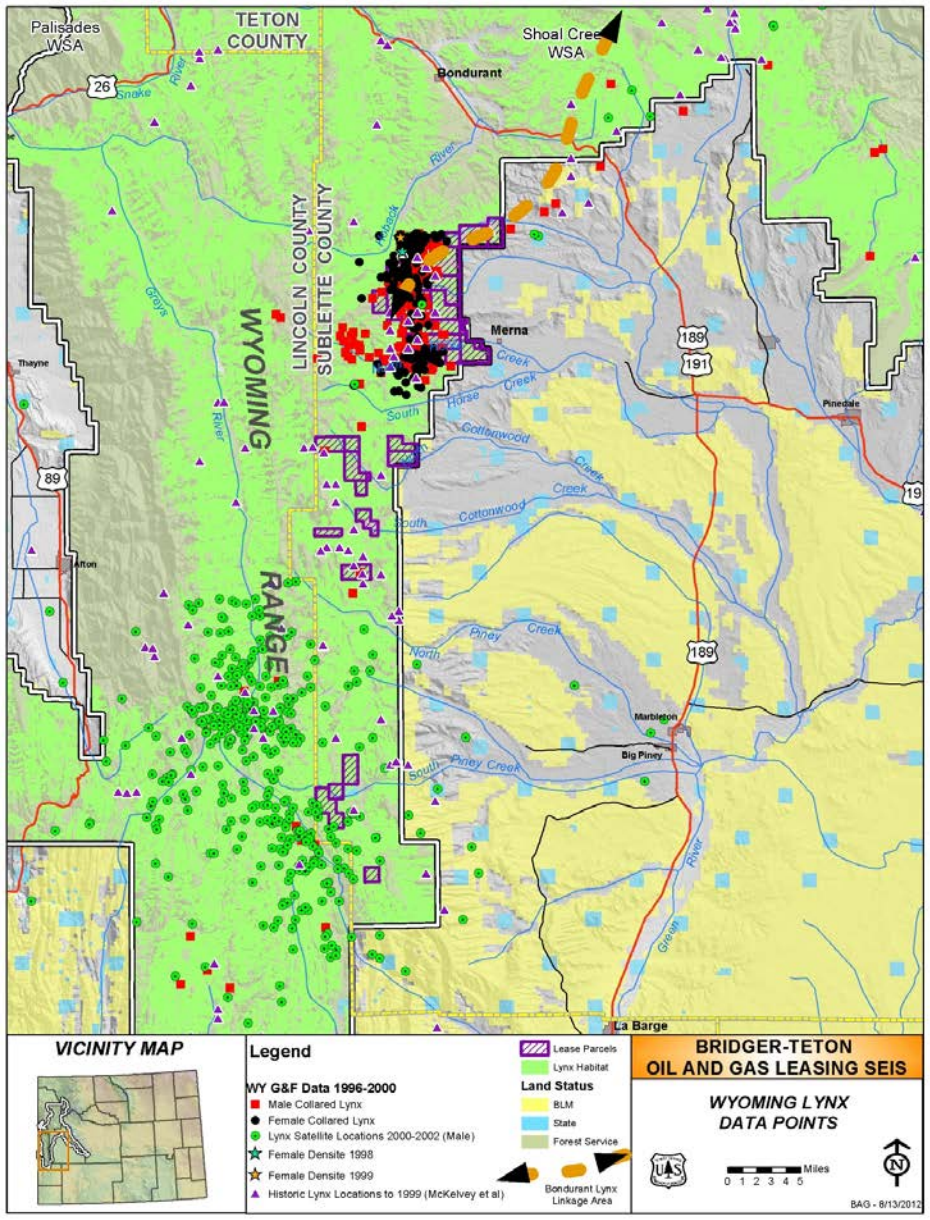
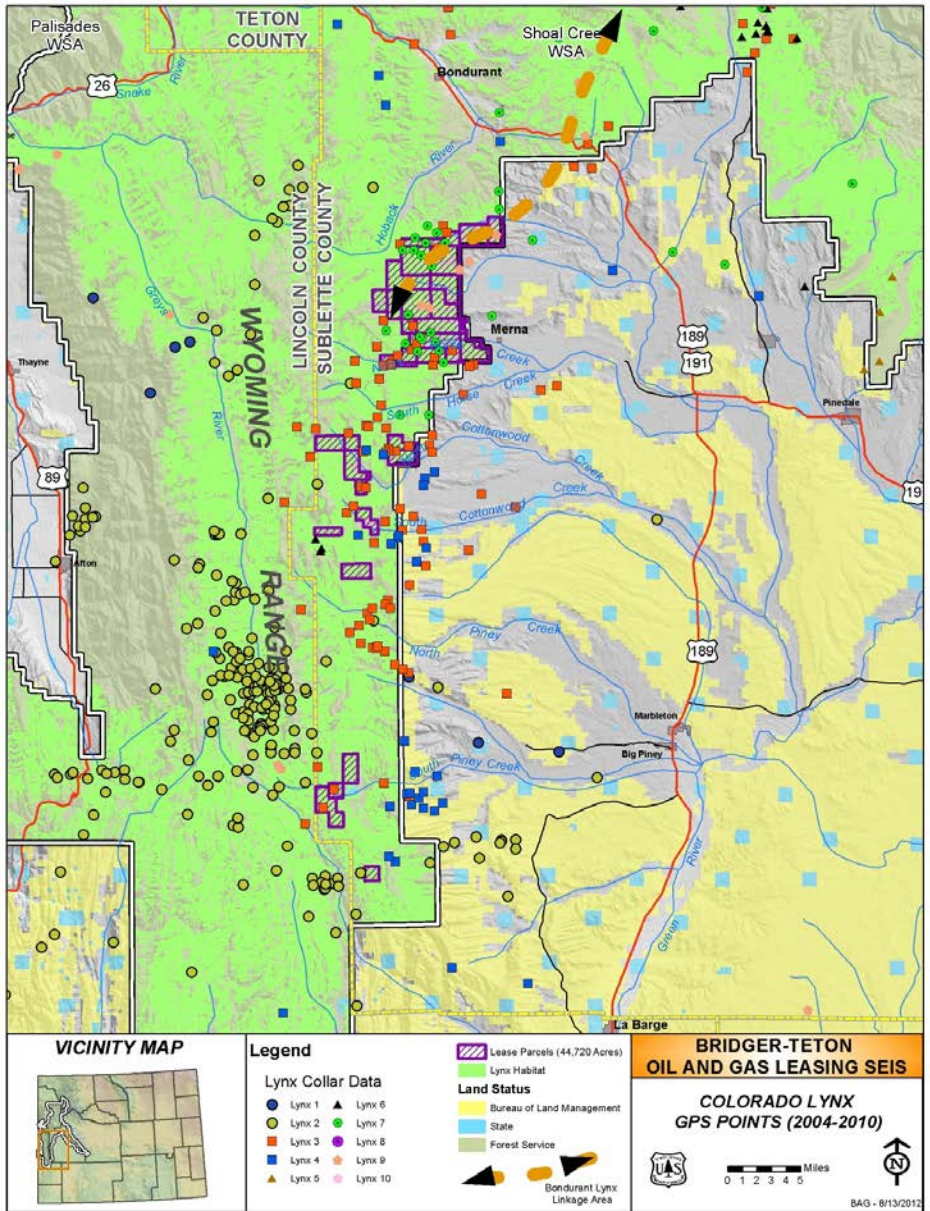




Figure 3.21(b): Colorado Lynx Locations Relative to the Project Area: Source - CDFW



**Lynx Analysis Units:** Lynx analysis units (LAUs) have been delineated across the BTNF and provide the fundamental scale at which to evaluate and monitor effects of management actions on lynx habitat. The project area overlaps nine LAUs. Seven of the nine LAUs are shared with the BLM, and encompass lynx habitat mapped and administered by the BLM Pinedale Field Office (Figure 3.22).

Lynx habitat across the BTNF was mapped according to protocol outlined in the Canada Lynx Conservation Assessment and Strategy and further defined according to the Northern Rockies Lynx Management Direction (NRLMD). A refined lynx habitat map was developed in 2012 by BTNF biologists and GIS specialists using the VEG 07 vegetation layer; VEG 07 incorporates vegetation mapping data from spatial data sources developed by the Remote Sensing Applications Center (RSAC) in Salt Lake City, UT. The newer lynx map was developed utilizing the same mapping protocols defined by the Lynx Steering Committee and as described in the NRLMD. Defined primary vegetation types that provide lynx habitat on the BTNF are subalpine fir habitat types dominated by cover types of spruce/fir, seral lodgepole pine, and aspen (USFS 2007a). Assessments and lynx habitat maps in this document utilized the newer lynx habitat maps developed from VEG 07 vegetation layers.

Mapped lynx habitat within LAUs encompassing the project area, as derived from the BTNF's lynx habitat layer and the BLM lynx habitat layer from the Pinedale Field Office, is displayed in Table 3.23 and Figure 3.24.

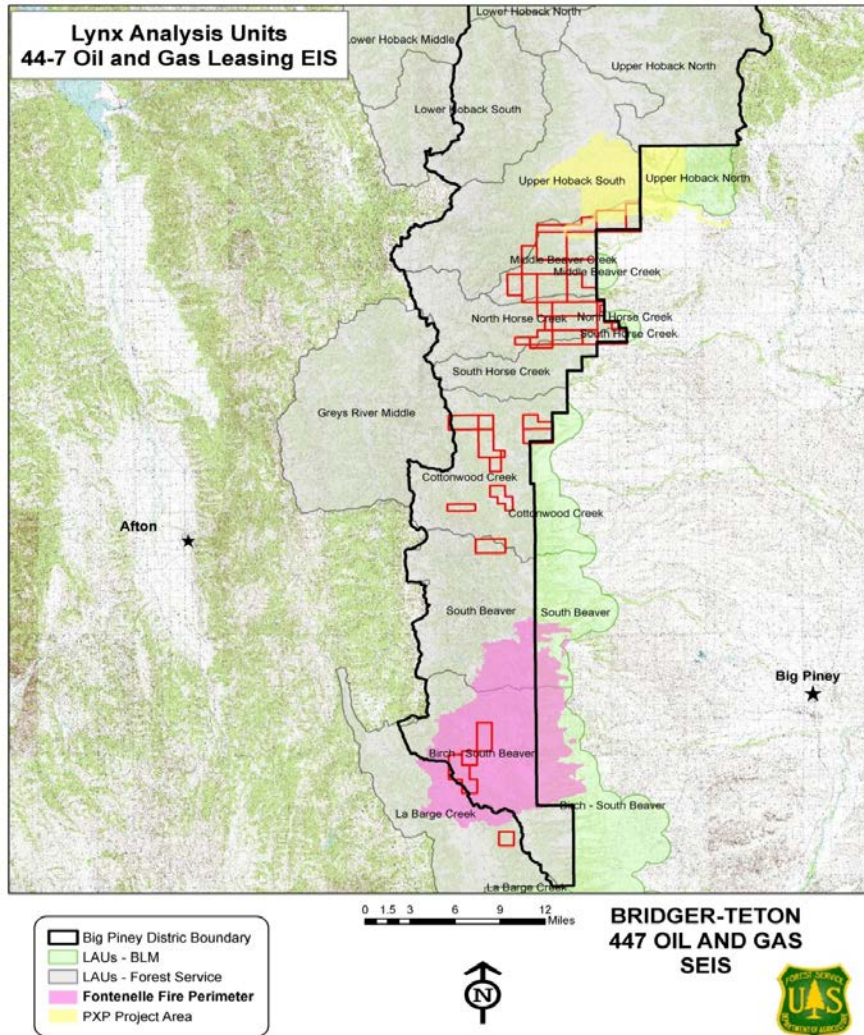
Because the proposed leasing is not a vegetation management project, objectives, standards, and guidelines in the Northern Rockies Lynx Management Direction related to vegetation management do not apply (USFS 2007a). However, the habitat distinctions are shown here to assess the quality and distribution of lynx habitat in the project area and to determine the relative value of each LAU for lynx. A large percentage of the North and South Horse Creek LAUs are in the stand initiation structural stage condition, which means the habitat is in the beginning stages of succession and not currently providing snowshoe hare habitat. This is largely the result of the 2007 Horse Creek Fire, which burned over 9,000 acres in the north and south Horse Creek drainages, reducing what was previously highly utilized and occupied lynx habitat (as mapped according to the Canada Lynx Conservation Assessment and Strategy).

### **Fontenelle Fire of 2012**

The Fontenelle Wildfire burned about 64,084 acres in the Wyoming Range in June and July 2012. The fire burned 47,874 Forest Service acres, 12,368 BLM acres, 829 State of Wyoming acres, and 3,013 acres of private lands. About 42,400, 8,407, and 13,123 acres burned within the Birch-South Beaver, La Barge Creek, and South Beaver Creek LAUs respectively. The extent and severity of impacts to lynx habitat in these affected LAUs was estimated results are displayed in Tables 3.23 and 3.55 and Figure 3.26. A total of about 42,655 acres of suitable lynx habitat was burned at varying intensities/severity within the fire perimeter. Of the 42,655 acres, 8,467 burned at high severity, 15,174 acres burned at moderate severity, 11,025 acres burned at low severity, and 7,989 burned at very low severity. The Fontanelle BARC4 data was combined with the lynx habitat data to provide a preliminary estimate of how much lynx habitat is now in an unsuitable condition. As described in the BARC4 metadata, "High Severity" burns typically consume both understory and overstory canopies. "Moderate Severity" burns sometimes result in crown fires in the overstory and can burn within the understory with little heat input into the soil (Greg Bevenger, pers comm.); non-crown fires can result in "needle scorch", and eventual tree mortality soon after the fire event (Diane Abendroth, pers comm). "Low Severity" burns are most usually "spotty" surface fires, but with little change in cover and little mortality of dominant vegetation. "Unchanged" is where pre-fire and post-fire conditions were indistinguishable in the satellite imagery, although, it doesn't always indicate that the area didn't burn.

For the purposes of analyzing fire effects on lynx habitat and per the fire intensity descriptions summarized above, it was assumed that areas in the Fontanelle Wildfire mapped as high or moderate severity no longer provide suitability of lynx. Field reconnaissance and air photos of the burned area indicate that lodgepole stands were most consumed by the fire while aspen and grassy areas had retained enough moisture to avoid burning. Most conifer plantations also did not burn. Tables 3.23 and 3.25 display estimates of lynx habitat condition by LAU before and after the Fontanelle fire.

**Figure 3.22: Lynx Analysis Units**



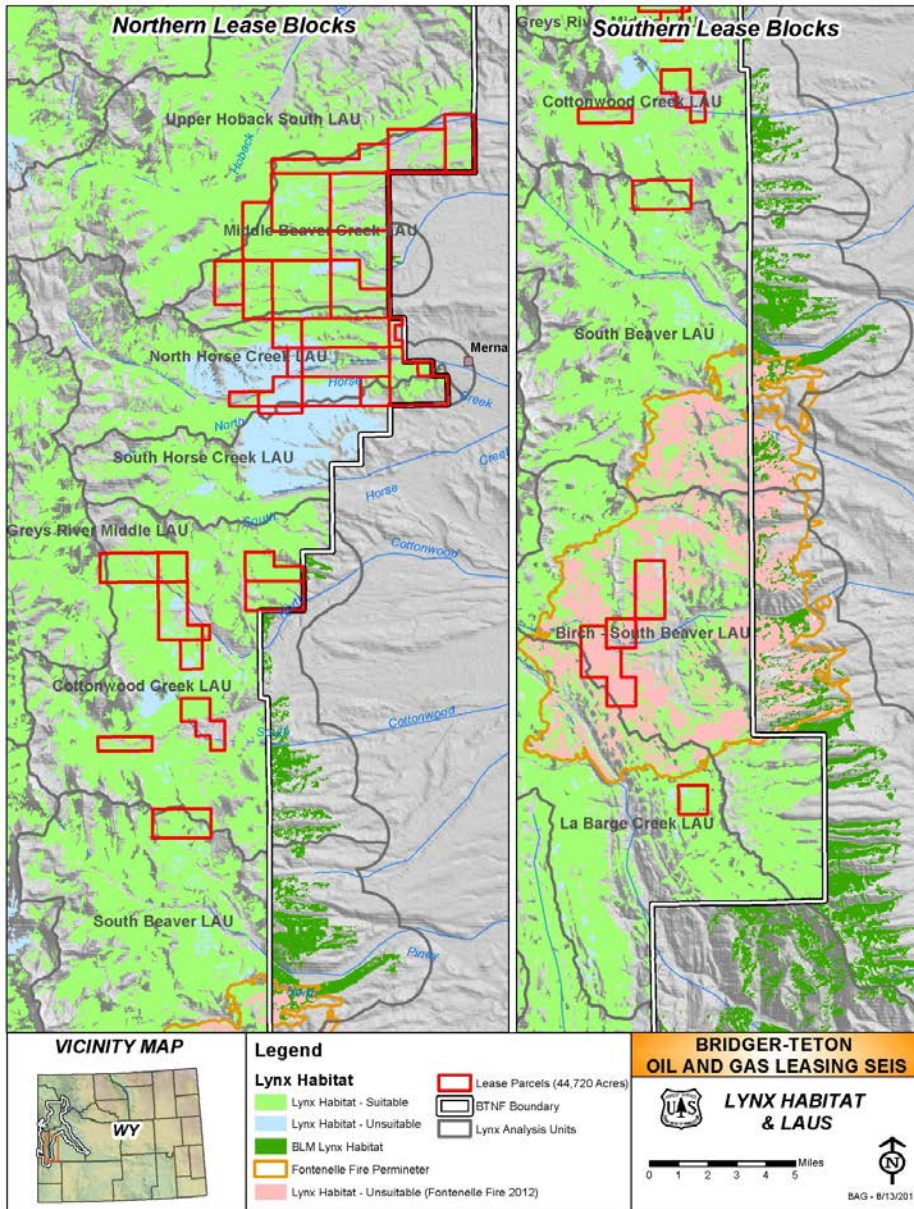
**Table 3.23: Acres of Lynx Habitat in Lynx Analysis Units, Entire LAU**

| Lynx Analysis Units Name and Total Acreage              | Non-Lynx Habitat Acres | Mapped Lynx Habitat Acres | Acres and Percent of Total Lynx Habitat in Unsuitable Condition Pre-Fontenelle Fire | Acres and Percent of Lynx Habitat in Unsuitable Condition Post-Fontenelle Fire <sup>1</sup> |
|---------------------------------------------------------|------------------------|---------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Birch-South Beaver<br>101,876 ac                        | 52,463                 | 49,413                    | 276 (<1%)                                                                           | 15,411 (31%)                                                                                |
| Cottonwood Creek<br>63,211 ac                           | 28,434                 | 34,777                    | 1,488 (4%)                                                                          | 1,488 (4%)                                                                                  |
| Greys River Middle<br>(82,231 ac)                       | 25,199                 | 57,032                    | 165 (<1%)                                                                           | 165 (<1%)                                                                                   |
| La Barge Creek<br>113,704 ac                            | 71,123                 | 42,581                    | 781 (2%)                                                                            | 3,256 (8%)                                                                                  |
| Middle Beaver<br>Creek 23,451 ac                        | 8,255                  | 15,195                    | 1,231 (8%)                                                                          | 1,231 (8%)                                                                                  |
| North Horse Creek<br>33,465 ac                          | 16,199                 | 17,266                    | 5,107 (30%)                                                                         | 5,107 (30%)                                                                                 |
| South Beaver<br>72,776 ac                               | 37,280                 | 35,496                    | 510 (1%)                                                                            | 4,968 (14%)                                                                                 |
| South Horse Creek<br>20,103 ac                          | 6,195                  | 13,908                    | 6,515 (47%)                                                                         | 6,515 (47%)                                                                                 |
| Upper Hoback<br>South (78,121 ac)                       | 40,221                 | 37,900                    | 240 (<1%)                                                                           | 240 (<1%)                                                                                   |
| Total Acres in<br>Cumulative<br>Effects Area<br>597,842 | 307,987                | 289,855                   | 17,422 (6%)                                                                         | 41,057 (14%)                                                                                |

<sup>1</sup>The areas that burned at high or moderate severity are considered lynx habitat in unsuitable condition. See discussion below.



Figure 3.24: Lynx Habitat in LAUs



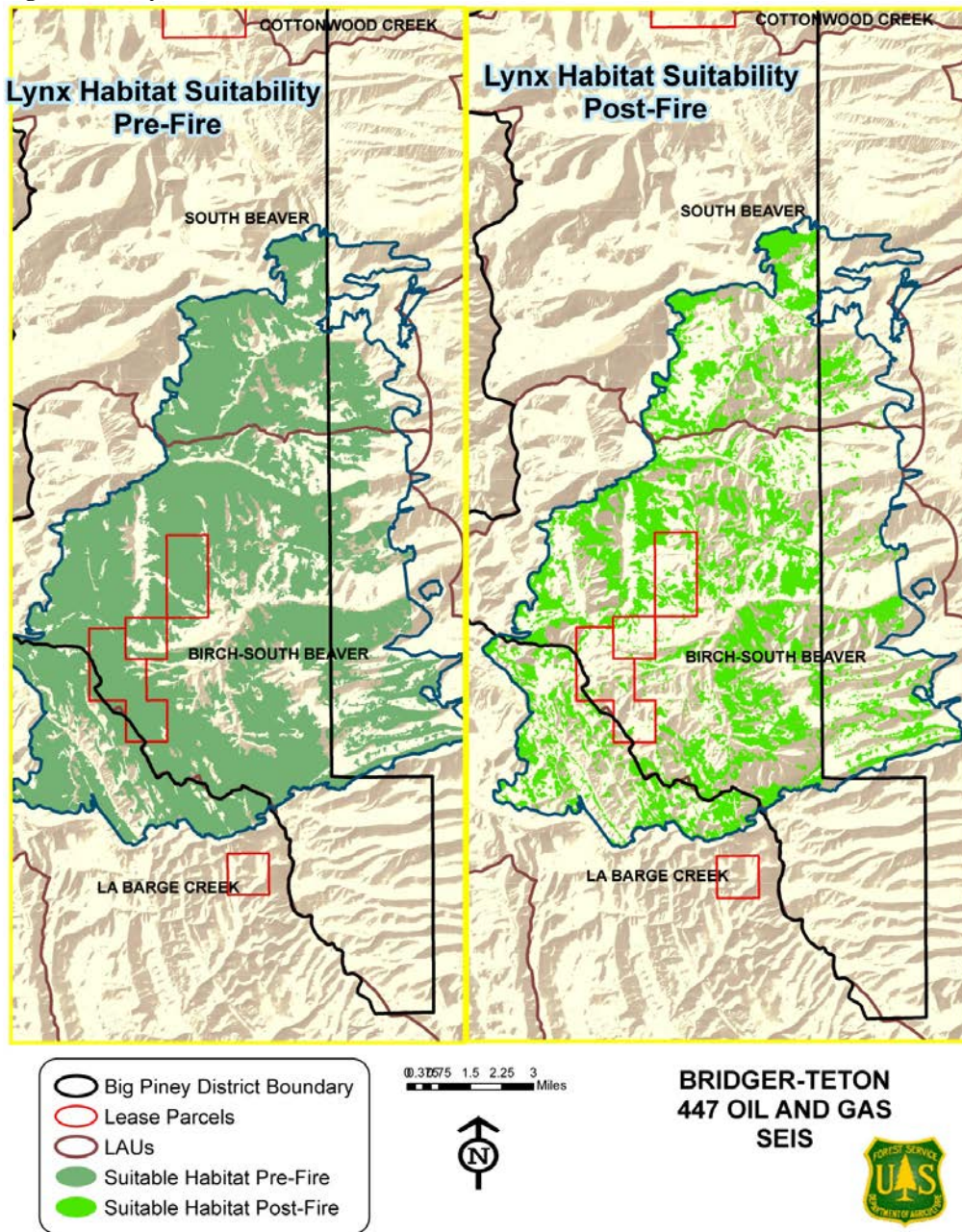
Although the project area overlaps nine LAUs, the preponderance of lease blocks overlap lynx habitat within the Middle Beaver Creek, North Horse Creek, Cottonwood Creek, and Birch South Beaver LAUs, respectively (Figure 3.23 and Table 3.32).

**Table 3.25: Acres of Lynx Habitat by Lynx Analysis Unit, in the Project Area**

| Lynx Analysis Unit            | Non-Lynx Habitat | Lynx Habitat | Acres and Percent of Total Lynx Habitat in Unsuitable Condition Pre-Fontenelle Fire | Lynx Habitat in Unsuitable Condition Post-Fontenelle Fire |
|-------------------------------|------------------|--------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------|
| <b>Northern Lease Cluster</b> |                  |              |                                                                                     |                                                           |
| Upper Hoback South            | 10               | 446          | 0                                                                                   | 0                                                         |
| Middle Beaver Creek           | 6,262            | 12,722       | 1,192 (9%)                                                                          | 1,192 (9%)                                                |
| North Horse Creek             | 5,227            | 3,656        | 2,618 (72%)                                                                         | 2,618 (72%)                                               |
| South Horse Creek             | 935              | 1,421        | 808 (57%)                                                                           | 808 (57%)                                                 |
| TOTAL                         | 12,434           | 18,245       | 4,618 (25%)                                                                         | 4,618 (25%)                                               |
| <b>Middle Lease Cluster</b>   |                  |              |                                                                                     |                                                           |
| Greys River Middle            | 15               | 106          | 0                                                                                   | 0                                                         |
| Cottonwood Creek              | 2,668            | 5,106        | 390 (8%)                                                                            | 390 (8%)                                                  |
| South Beaver                  | 287              | 811          | 53 (7%)                                                                             | 53 (7%)                                                   |
| TOTAL                         | 2,970            | 6,023        | 443 (7%)                                                                            | 443 (7%)                                                  |
| <b>Southern Lease Cluster</b> |                  |              |                                                                                     |                                                           |
| Birch-South Beaver            | 476              | 3,187        | 65 (2%)                                                                             | 2,659 (83%)                                               |
| La Barge Creek                | 81               | 760          | 35 (5%)                                                                             | 197 (26%)                                                 |
| TOTAL                         | 557              | 3,947        | 100 (3%)                                                                            | 2,856 (72%)                                               |
| TOTAL ALL                     | 15,961           | 28,215       | 5,161 (18%)                                                                         | 7,917 (28%)                                               |



Figure 3.26: Lynx Habitat in Suitable Condition Pre- and Post-Fontenelle Fire



**Road Density in LAUs**

As discussed above, open roads may increase the vulnerability of lynx to human caused mortality in several ways. Human access via Forest roads can increase the potential for mortality or injury of lynx through illegal shooting, accidental trapping, or collision with vehicles. Additionally, roads may negatively impact Canada lynx through facilitating the movement of competing carnivores. Open road density is considered a risk factor affecting survival, movement, and productivity.

Open road densities were calculated for each LAU within the project analysis area, and within the additional LAU that is encompassed in the cumulative effects analysis boundary for lynx. These calculations include open roads in the entire LAUs including BLM administered land. Table 3.33 displays the results of the open road density calculations.

**Table 3.27: Miles of Open Roads per Square Mile in LAUs**

| LAU Name                                                  | Miles of Open Roads in LAU | Square Miles in LAU | Open Road Density (miles/mile <sup>2</sup> ) |
|-----------------------------------------------------------|----------------------------|---------------------|----------------------------------------------|
| Birch-South Beaver                                        | 158                        | 159                 | 1.0                                          |
| Cottonwood                                                | 72                         | 99                  | .72                                          |
| Grey's River Middle (part of project area only)           | 72                         | 128                 | .56                                          |
| La Barge                                                  | 185                        | 178                 | 1.04                                         |
| Middle Beaver                                             | 27                         | 37                  | .73                                          |
| North Horse                                               | 18                         | 52                  | .35                                          |
| South Beaver                                              | 68                         | 114                 | .60                                          |
| South Horse                                               | 5                          | 31                  | .16                                          |
| Upper Hoback South                                        | 61                         | 122                 | .50                                          |
| Upper Hoback North (part of cumulative effects area only) | 90                         | 142                 | .63                                          |

As previously mentioned, snowshoe hare abundance is “the primary factor driving lynx populations, behavior and distribution” (USFWS 2007a). The importance of the Wyoming Range and project area for lynx is apparently due primarily to the abundance of snowshoe hare as verified by very recent research within and surrounding the project area. This research was entirely on the BTNF with study sites in several mountain ranges (Absaroka, Gros Ventre, Wind River, and Salt River, Wyoming) in the southern portion of the Greater Yellowstone area (Berg 2012). In the study “a broad range of pellet counts and snowshoe hare densities” were found, including “**some of the highest observed hare densities in recent years in the continental United States, British Columbia, Labrador, and Quebec**” (Ibid.).

Snowshoe hares are typically most abundant (Ruediger et al. 2000) in even-age, regenerating (30-60 year old) lodgepole pine stands. However, Berg’s research (2012) in addition to other studies indicated that “multi-storied forests within a spruce-fir component are disproportionately important to snowshoe hares, red squirrels, grouse and lynx in the Greater Yellowstone area” (Buskirk et al. 2000, Hodges and Mills 2005, Murphy et al. 2006). Data from this research (Berg, unpublished data 2009) demonstrated that the Hoback Rim and eastern front of the Wyoming Range are unique for lynx in terms of prey base (snowshoe hares). Hare densities on the Hoback Rim and

eastern front of the Wyoming Range (Table 3.34) within mature multi-story forest types (spruce/fir, lodgepole pine/spruce/fir, and aspen/spruce/fir) were found to be much greater than other surveyed locations in the BTNF (Berg, unpublished data 2009).

The Wyoming Range is one of the few places on the BTNF that is part of the “Wasatch Formation”, in which the soils are high in clay (which holds moisture well) and is relatively nutrient rich (Berg, pers. comm. 2009). This likely plays a significant role in the vegetation patterns. This same relationship was documented by Murphy (et al. 2006) where lynx occurrence in Yellowstone National Park was found to be “apparently limited to the East Sector... and possibly the Central Plateau...” The East Sector is dominated by andesitic soils that exceed other park soils in moisture-holding capacity and nutrients, and better support subalpine fir and Engelmann spruce forests with thick understory vegetation desired by snowshoe hares (Wolfe et al. 1982 and Despain 1990 as cited in Murphy et al. 2006).

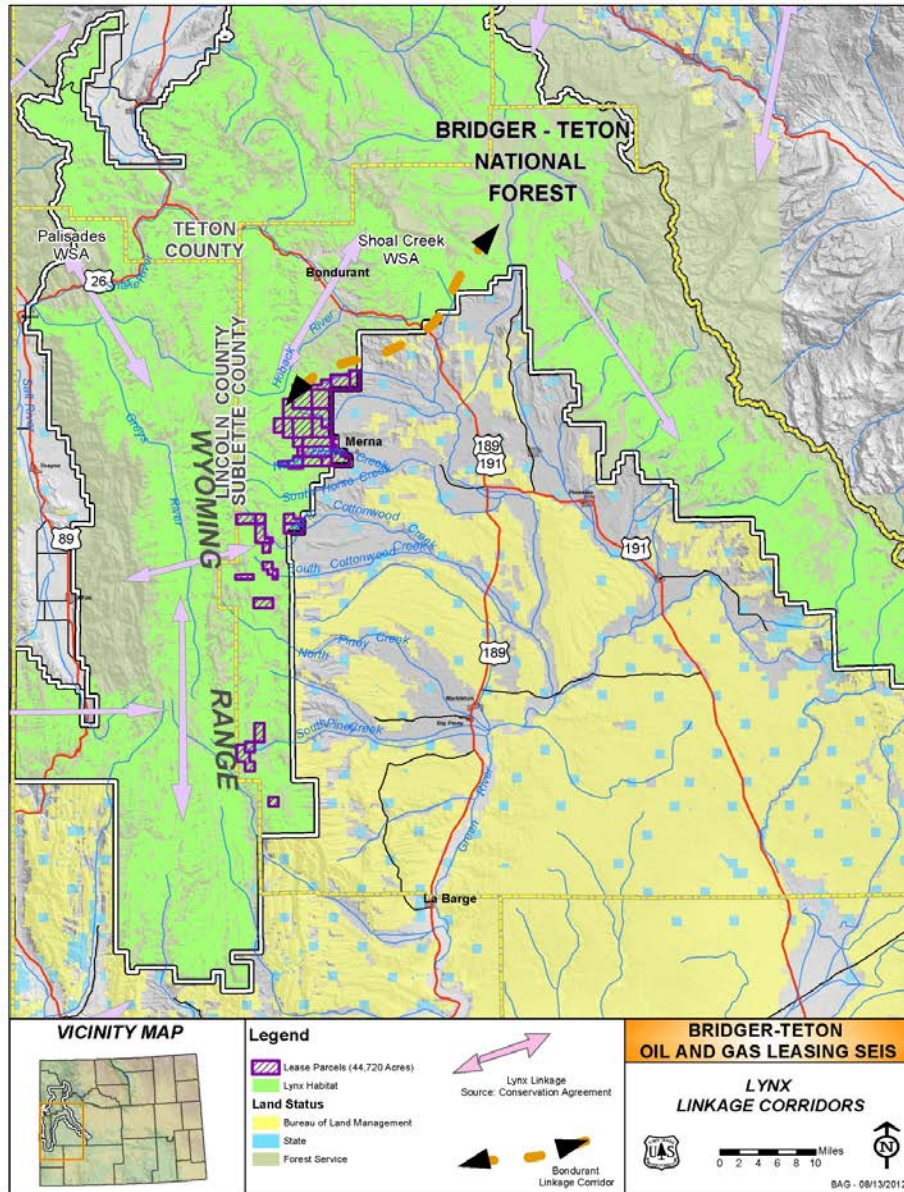
The density of snowshoe hares required to support a continuous and reproducing lynx population has not been established for the contiguous United States (FDR Vol. 74, No. 36, pg. 8636). However, Ruggiero (et al. 2000, pg 446-447) suggested that at least 0.5 hares per hectare may be required and a modeling effort conducted by Steury and Murray (2004 as cited in FDR Vol. 74, No. 36, pg. 8636) predicted that between 1.1 to 1.8 hares per hectare would be required for the persistence of lynx reintroduced into the southern portion of their range.

**Table 3.28: Snowshoe Hare Density (Berg, unpublished data 2009)**

| Survey Locations                          | Average Number of Snowshoe Hares per Hectare |                                   |
|-------------------------------------------|----------------------------------------------|-----------------------------------|
|                                           | Multistory Stands                            | 30-60 yr. old Regenerating Stands |
| Hoback Rim/Eastern Front of Wyoming Range | 1.6                                          | 0.8                               |
| Elsewhere on BTNF                         | 0.7                                          | 1.3                               |



**Figure 3.29: Approximate Hoback Rim/ "Bondurant" Linkage Relative to the Project Area**



Canada lynx in the Wyoming Range are immensely significant to conservation because they are the southern-most naturally occurring lynx in North America (Squires et al. 2003). The distance to primary populations in the contiguous United States, which are all near the Canadian border, may make it “particularly vulnerable to demographic, genetic, and environmental stochastic processes” (Shaffer 1981 and Gilpin and Soule as cited in Squires et al. 2003). In addition, reintroduced lynx dispersing from Colorado colonized the northeast portion of the range (in the project area) and other nearby areas as previously described. Although the status of these animals is unknown, their movements demonstrate that habitat provided in the Wyoming Range is identified and used by dispersing lynx and that this area may represent an important site for colonization.

The entire project area, from LaBarge Creek north, is considered vitally important lynx habitat (Squires, pers. comm. 2008). The drainages within the northern block, north/south Horse Creek and Middle Beaver Creek may be of particular value as evidenced by the extensive use by collared lynx (Figure 3.21). Habitat within Horse, Cottonwood, and Beaver creeks (within the project area north and middle lease blocks) has been identified as one of three key use areas (areas where lynx were detected on five or more occasions on two or more consecutive winter field seasons) by Endeavor Wildlife Research (EWR, unpublished report 2008).

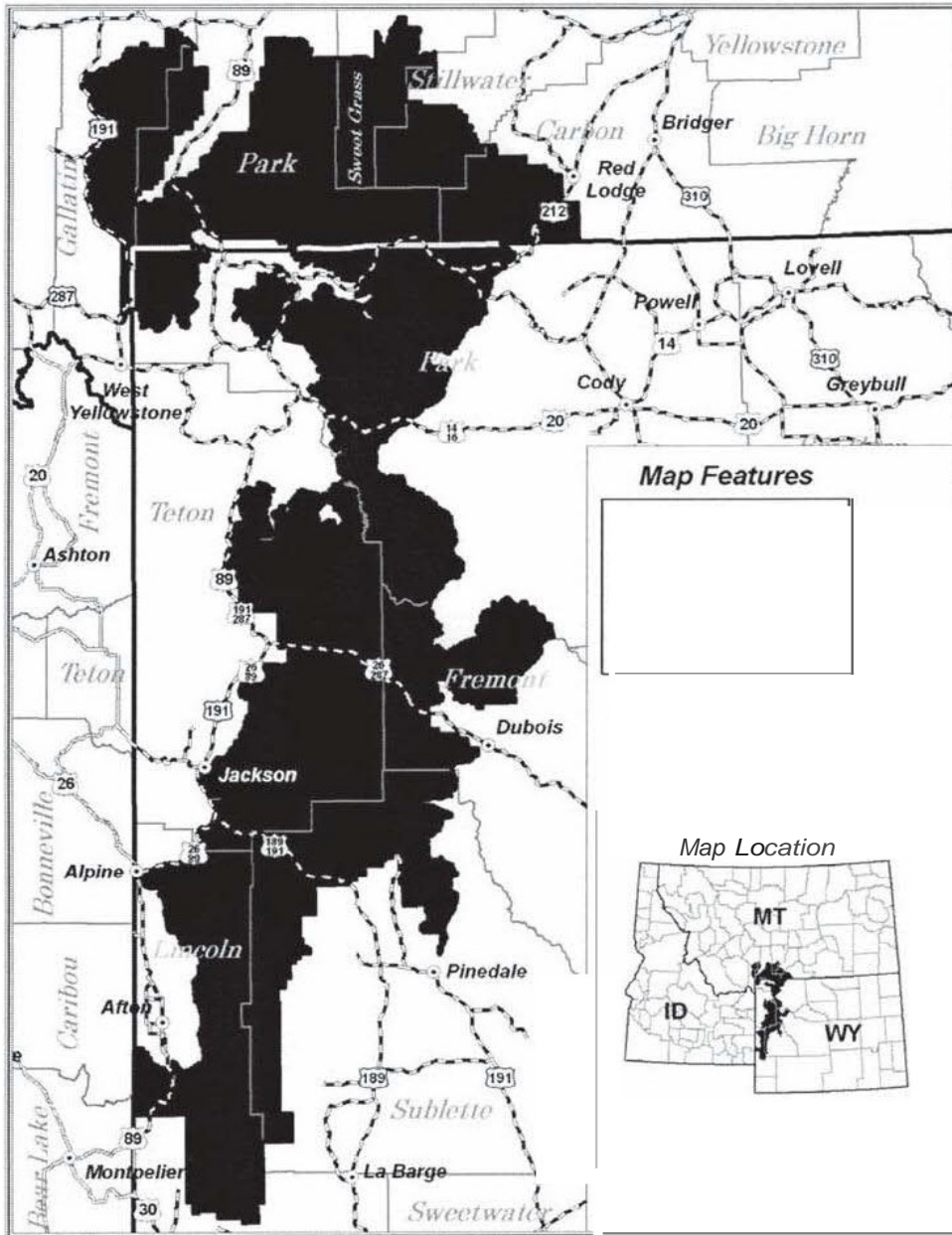
### Critical Habitat

The project area is within designated critical habitat for lynx (as is almost the entire BTNF) (FDR Vol. 74, No. 36, February 25, 2009) (Figure 3.26). On February 25, 2009, the USFWS designated revised critical habitat for the contiguous United States distinct population segment of the Canada lynx under the Endangered Species Act of 1973, as amended (FDR Vol. 74, No. 36, February 25, 2009). (The USFWS originally designated a smaller amount of critical habitat. The “revised” critical habitat added 39,000 square miles to the existing 1,841 square miles.) The 39,000 square miles of revised critical habitat is designated in five units in the states of Idaho, Maine, Minnesota, Montana, Washington, and Wyoming. The project area is within the Unit 5, Greater Yellowstone area habitat unit, which includes 9,500 square miles. The 44,720-acre project area composes approximately 70 square miles or 0.74 percent of the Greater Yellowstone area critical habitat unit.

In designating critical habitat for Canada lynx, the USFWS considered essential physical and biological features, also referred to as 'primary constituent elements', laid out in the appropriate quantity and spatial arrangement for conservation of the species. In general, these primary constituent elements include, but are not limited to the following: space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, or rearing (or development) of offspring; and habitats that are protected from disturbance or are representative of the historic, geographical, and ecological distributions of a species.

For lynx, the primary constituent element is the boreal forest landscape supporting a mosaic of differing successional forest stages and containing: (i) presence of snowshoe hares and their preferred habitat conditions, including dense understories of young trees or shrubs or overhanging boughs that protrude above the snow, and mature multistoried stands with conifer boughs touching the snow surface; (ii) winter snow conditions that are generally deep and fluffy for extended periods of time; (iii) sites for denning having abundant, coarse, woody debris, such as downed trees and root wads; and (iv) matrix habitat (e.g., hardwood forest, dry forest, non-forest, or other habitat types that do not support snowshoe hares) that occurs between patches of boreal forest in close juxtaposition (at the scale of a lynx home range) such that lynx are likely to travel through such habitat while accessing patches of boreal forest within a home range. The important aspect of matrix habitat for lynx is that these habitats retain the ability to allow unimpeded movement of lynx through them as lynx travel between patches of boreal forest (FDR Vol. 73, No. 40, pg 10882 and FDR Vol. 74, No. 36, pg. 8638).

Figure 3.30: Designated Critical Habitat for Canada Lynx





In identifying critical habitat, the USFWS “delineated, within the geographical area currently occupied by the species at the time of listing, areas containing physical and biological features [primary constituent elements] essential to the conservation of lynx.” A geographic area was considered occupied by the species if there was “verified evidence” of lynx occurrence and breeding (FDR Vol. 74, No. 36, page 8640). The Greater Yellowstone area, Unit 5, is considered currently occupied by lynx (FDR Vol. 74, No. 36, page 8643). The USFWS also summarized it as being “naturally marginal lynx habitat with highly fragmented foraging habitat. For this reason lynx home ranges in this unit are likely to be larger and incorporate large areas of non-foraging matrix habitat” (Ibid. pg. 8644). As previously discussed, a den site was documented to occur within the project area. The USFWS has stated that “evidence of breeding populations is the best way to verify that the physical and biological features essential to lynx are present in sufficient quantity and special configuration to meet the needs of the species” (FDR Vol. 74, No. 36, pg. 8640).

The previous discussion underscores the importance of the project area for virtually all aspects of the lynx life cycle. In addition to these factors it should be noted that suitable winter and associated denning habitat within the Greater Yellowstone area occurs in fragmented parcels (Oakleaf, pers. comm., 2009). According to one source, this highly critical habitat feature may make up less than a roughly estimated 12 percent of the entire Greater Yellowstone area (Oakleaf, pers. comm., 2009). This indicates that although the Greater Yellowstone critical habitat unit contains over six million acres of habitat, not all of this habitat is equally valuable for lynx.

#### New References:

Berg, D.B, Gese, E.M, Squires, J.R, and L.M. Aubry. 2012. Influence of Forest Structure on the Abundance of Snowshoe Hares in Western Wyoming. *The Journal of Wildlife Management*.

Reeve, A., Lindzey, F. and S. Buskirk. 1986. Historic and Recent Distribution of the lynx in Wyoming. Report prepared for the Wyoming Game and Fish Department. Wyoming Cooperative Fishery and Wildlife Research Unit, Laramie, WY. 77pp.

## Eric FY2015 Accomplishments:

### **Element 1**

I continually develop others by:

- ensuring that all personnel in the branch completed IDPs, safety procedures/protocols, and required training
- ensured timely completion of all EOY reporting—PRS, TAILS, ROAR, and RDC
- Managed the branch to meet PRS targets
- Supervised 3 FTEs in the Field Office
- Coached supervisors in Region 1 on providing feedback and conducting performance reviews
- Sent Melissa Mata on detail to the Environmental Review Branch in the RO

### **Element 2**

- Completed the Highway 434 formal consultation for FHWA on the jumping mouse and flycatcher
- Completed the Southwest Jemez Mountains restoration biological opinion for the jumping mouse
- Provided timely emergency consultations for wildfires
- Completed 4 consultations with Bosque del Apache on wetland restoration to benefit the jumping mouse and flycatcher.
- Provided technical assistance to the Forest Service on the development of biological assessments and consultations for the New Mexico meadow jumping mouse
- Completed the survey protocol for the New Mexico meadow jumping mouse
- Began drafting the Conservation Strategy for the New Mexico meadow jumping mouse with the Forest Service
- Completed protocols for the Rapid Vegetation Assessment for the New Mexico meadow jumping mouse critical habitat on Forest Service lands
- Regularly updated IPAC to automate our section 7 database requests
- Completed numerous informal consultation requests from Federal Agencies
- Completed a batched grazing consultations for the Santa Fe and Gila Forests

- Covered for the vice-MSO position
- Numerous recovery activities, consultations, and technical assistance were completed under my direction
- Provided technical assistance to R1 Refuge Staff, OFWO, and Tualatin National Wildlife Refuge on the Corps of Engineers 404(q) elevation process regarding an individual permit that proposes to develop a hard rock mining operation that could impact the refuge
- Completed numerous data requests from HQ for National Pesticide consultations
- Provided technical guidance to Region 1 staff on Coeur d'Alene basin NRDA issues
- Oversaw the obligation of \$75,000 of Congressional funding to support northern aplomado falcon recovery efforts by The Peregrine Fund

### **Element 3**

- Developed and maintained a productive working relationship with Bosque del Apache to implement management actions that will benefit the jumping mouse, flycatcher, and cuckoo
- Organized and completed field site coordination meetings to occupied jumping mouse localities in the New Mexico (Coyote Creek State Park, Sugarite Canyon State Park, Bosque del Apache NWR, Jemez Ranger District, Sacramento Ranger District, Apache-Sitgreaves National Forest)
- Organized and led Coordination and Project-specific meetings with staff from Forest Service Regional Office, Lincoln, Gila, Carson, and Santa Fe Forests
- Organized and led Coordination and Project-specific meetings with staff from New Mexico Natural Heritage
- Organized and led Coordination and Project-specific meetings with staff from New Mexico Department of Transportation and Federal Highways
- Provided coordination and oversight on the Sacramento Mountains checkerspot butterfly Conservation Plan
- Led an Interagency Coordination Meeting to provide clear communication internally and externally on current T&E issues
- Coordination with New Mexico Department of Game and Fish on the status of lynx

- Presented information on jumping mouse proposed listing at the Region Tribal Coordination Meeting

#### **Element 4**

- Supervised 3 FTEs in the Field Office to complete assignments that were timely, organized, and technically sound
- Completed Recovery Money Expenditure report for Congress
- Ensured timely completion of Pecos sunflower conservation actions
- Point of contact for a contract with Northern Arizona University to study jumping mice on the A-S National Forest
- Completed Region 2 technical assistance on the Rio Grande cooter and Arizona toad (HQ is the lead)
- Co-teacher of SSA webinars for Region 2 using jumping mouse as an example
- Brown bag seminar on SSA process for Region 1 staff
- Completed a detail in Region 1 as section 7 and HCP Chief
- Completed the 2015 CNOR
- Provided oversight on timely completion of Jemez Mountains Salamander consultations
- Completed Recovery Money Expenditure report for Congress
- Completed all Terrestrial and Aquatics Branch FOIA Requests
- Presented multiple webinars on the jumping mouse listing and SSA process
- Completed Section 6 grant requests with New Mexico Department of Game and Fish and New Mexico State Forestry
- Successfully obtained funding to continue populate the section 10 Recovery Permit Database with Natural Heritage, including changing the reporting requirements so that permittees submit annual reports directly to Heritage for georeferencing
- Assisted in completing Pecos sunflower 5 year review
- Led public informational meetings on the Apache-Sitgreaves National Forest on the jumping mouse listing and proposed critical habitat
- Completed Job Hazard Analyses for Terrestrial and Aquatic Ecosystem Branch Developed to support the safety of our personnel
- 34 informal and 4 formal (Moreno Springs Restoration; Southwest Jemez; Highway 434 reconstruction; Bosque del Apache wetland impoundments) consultations were completed

- Complete technical review of the formal consultation for the Mexican wolf rule
- Completed technical review of the Columbian white-tailed deer reclassification rule
- Held numerous variety of conference/video calls with Region 1 ES Chiefs, ES Project leaders, and deputies
- Oversaw Technical assistance for fish surveys on Navajo Nation and Zuni Pueblo; White Sands pupfish monitoring; and Headwater chub monitoring for SSA
- Oversaw issues related to Zuni bluehead sucker including: draft of Zuni bluehead sucker final critical habitat rule; review and comment on Tribal management plans; Tribal consultations with Navajo Nation; Re-initiation of LRMP for the Zuni bluehead sucker and technical assistance for the Navajo Nation and Zuni Tribe with their fisheries management plans
- Oversaw the reallocation of station funds to contract the Gila Trout Recovery Plan
- Oversaw the recruitment of a Pathways Student to the NMESFO
- Oversaw the obligation and administration of additional funding from Customs and Border Protection (CBP) for long-nosed bat roost surveys and aplomado falcon surveys and habitat use in New Mexico
- Oversaw the coordination and quarterly input to Department of Interior agencies and CBP at Border Management Task Force meetings
- Oversaw NMESFO's mitigation project proposals, obligations, contracting, environmental compliance, and reporting for Border projects conducted under the waiver of environmental laws, totaling \$2,195,912
- Oversaw the Cooperative Agreement on Pecos sunflower protective measures in Santa Rosa

**From:** Murphy, Wally  
**To:** [Zenone, Patricia](mailto:Zenone.Patricia)  
**Subject:** Re: Clarification on roles and responsibilities for the FYT 15 Accomplishments Celebration  
**Date:** Monday, November 23, 2015 11:02:58 AM  
**Attachments:** [ATEC 2015 Accomplishments.docx](#)

---

Hey Pat my understanding is Eric has signed out until 12/1. Here are the accomplishments he provided. Thank you so much for doing this. wm

On Mon, Nov 23, 2015 at 10:51 AM, Zenone, Patricia <[patricia\\_zenone@fws.gov](mailto:patricia_zenone@fws.gov)> wrote:  
Good morning, Wally.

Could you please send me the list of accomplishments that you may have distributed to the FOLT recently, so I can prepare a Powerpoint for our next staff meeting? I was also wondering if you have heard anything about how long Eric may be out of the office.

Thank you, Wally.

On Thu, Nov 19, 2015 at 6:50 AM, Murphy, Wally <[wally\\_murphy@fws.gov](mailto:wally_murphy@fws.gov)> wrote:  
At he next Staff Meeting we will be celebrating our FY15 accomplishments. A question was asked about the three questions I asked each of you to prepare for at the last staff Meeting which was Cancelled. So here's what we are going to do:

1. FOLT members will supply the food and drinks (Potluck Style) Of course if you want to bring something that's great.
2. I will provide an introduction.
3. Johnna Roy will also be here and she will say a few words as well.
4. Each Branch Chief will have a powerpoint displaying their Branches significant FY15 Accomplishments which includes the totality of our workload. (It's a lot and a major accomplishment in and of itself.)
5. Each employee should be prepared to discuss something that we could do better on in FY16 or something that you thought went really well in FY15.

The Staff Meeting will start at 10 am and run longer than normal. wm

--

Wally Murphy  
NMESFO Supervisor  
505/761-4781  
CP 505/480-4821

"We are what we repeatedly do. **Excellence** then, is not an act, but a habit." Aristotle

--

Wally Murphy  
NMESFO Supervisor  
505/761-4781  
CP 505/480-4821

"We are what we repeatedly do. **Excellence** then, is not an act, but a habit." Aristotle

**From:** [Bell, Heather](#)  
**To:** [Parkin, Mary](#)  
**Cc:** [Zelenak, Jim](#)  
**Subject:** Re: Workshop Notes  
**Date:** Tuesday, November 24, 2015 7:44:44 AM

---

Geez mary thank you for this work!  
i would have gone crazy :-)

Heather Bell  
Ecological Services HQ  
Branch of Conservation Integration  
SSA Framework Team Lead  
Remotely Located at  
134 S. Union Blvd  
Lakewood, CO 80228  
303-236-4514

Check it out! SSA Framework - Google Site for Staff  
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>

On Mon, Nov 23, 2015 at 6:34 AM, Parkin, Mary <[mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)> wrote:

Hi both,

Attached are the final two zip folders for the presentations. These include the slides on lynx status in the various populations.

All told, there should now be 14 presentations included in 4 zip folders (EE workshop presentations 1-4). Jim, if you notice that I've missed any slide presentation, please let me know.

I'll send the expert responses for redundancy and representation along shortly.

Cheers,  
Mary

On Fri, Nov 20, 2015 at 5:33 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

I have them almost but not quite finished, so will have to send out on Monday. Talk to you both then, too.

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)



--

*Mary Parkin*

*Endangered Species Recovery Coordinator, Northeast Region*

*U.S. Fish and Wildlife Service, Hadley, MA*

*Remotely located in Escalante, Utah:*

*Mailing address PO Box 637, Escalante, UT 84726*

*Street address 145 North Center St, Escalante, UT 84726*

*Phone 617-417-3331*

*Email [mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)*

**From:** [Parkin, Mary](#)  
**To:** [Jim Zelenak](#); [Mark McCollough](#); [Tamara Smith](#); [Kurt Broderdorp](#); [Bryon Holt](#); [Heather Bell](#); [Jonathan Cummings](#)  
**Cc:** [Jodi Bush](#); [Seth Willey](#)  
**Subject:** Worksheet for lynx core team call  
**Date:** Tuesday, November 24, 2015 9:04:03 AM

---

Hi all,

In case you want to preview this before the call, I just uploaded a new version of the IPS Excel file to Google Drive. I've only had time to transfer one set of information from the Cardinal Questions to the IPS worksheet: the **Individual Level** needs. If we can discuss on the call today, that'd be great. I can then be as efficient as possible in transferring other info over from the Cardinal Questions.

Re: the worksheet, I'd like to go over (1) relevant categories of need -- and at the individual level we include life history characteristics, (2) the accuracy of what's there, and (3) what's missing.

Thanks, and talk with y'all shortly,  
Mary

--

*Mary Parkin*  
*Endangered Species Recovery Coordinator, Northeast Region*  
*U.S. Fish and Wildlife Service, Hadley, MA*  
*Remotely located in Escalante, Utah:*  
*Mailing address PO Box 637, Escalante, UT 84726*  
*Street address 145 North Center St, Escalante, UT 84726*  
*Phone 617-417-3331*  
*Email [mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)*

**From:** [Nichole Bjornlie](mailto:Nichole.Bjornlie)  
**To:** [Zelenak, Jim](mailto:Zelenak, Jim)  
**Subject:** Re: Canada Lynx Expert Elicitation Workshop Notes  
**Date:** Tuesday, November 24, 2015 4:00:14 PM

---

Hi Jim,

Thanks for sending these along. I did get these with the Bjornlie address, so I'm not sure why it would have an issue. Either way, they've set everything up so it's forwarded to my new address, so e-mails should hopefully get to me one way or another!

Thanks again,  
Nichole

On Tue, Nov 24, 2015 at 3:52 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Hi Nichole,

I got several kick-backs for your other email address ([nichole.bjornlie@wyo.gov](mailto:nichole.bjornlie@wyo.gov)), so I am re-sending the workshop notes and supporting materials - several more to follow.

Jim

----- Forwarded message -----

**From:** **Zelenak, Jim** <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>

**Date:** Tue, Nov 24, 2015 at 1:22 PM

**Subject:** Canada Lynx Expert Elicitation Workshop Notes

**To:** "McKelvey, Kevin -FS" <[kmckelvey@fs.fed.us](mailto:kmckelvey@fs.fed.us)>, Erin Simons-Legaard <[erin.simons@maine.edu](mailto:erin.simons@maine.edu)>, "Vashon, Jennifer" <[jennifer.vashon@maine.gov](mailto:jennifer.vashon@maine.gov)>, Ron Moen <[rmoen@d.umn.edu](mailto:rmoen@d.umn.edu)>, "Catton, Susan J -FS" <[scatton@fs.fed.us](mailto:scatton@fs.fed.us)>, "Squires, John -FS" <[jsquires@fs.fed.us](mailto:jsquires@fs.fed.us)>, Jay Kolbe <[jkolbe.fwp@gmail.com](mailto:jkolbe.fwp@gmail.com)>, "Maletzke, Benjamin T (DFW)" <[Benjamin.Maletzke@dfw.wa.gov](mailto:Benjamin.Maletzke@dfw.wa.gov)>, Jake Ivan - DNR <[Jake.ivan@state.co.us](mailto:Jake.ivan@state.co.us)>, "Bowman, Jeff (MNR)" <[jeff.bowman@ontario.ca](mailto:jeff.bowman@ontario.ca)>, "Jackson, Scott -FS" <[sjackson03@fs.fed.us](mailto:sjackson03@fs.fed.us)>, "Schwartz, Michael K -FS" <[michaelkschwartz@fs.fed.us](mailto:michaelkschwartz@fs.fed.us)>, "Hodges, Karen" <[karen.hodges@ubc.ca](mailto:karen.hodges@ubc.ca)>, Josh Lawler <[jlawler@uw.edu](mailto:jlawler@uw.edu)>, "Wilsey, Chad" <[cwilsey@audubon.org](mailto:cwilsey@audubon.org)>, [freli001@umn.edu](mailto:freli001@umn.edu), Alexej Siren <[asiren@umass.edu](mailto:asiren@umass.edu)>, "Baker, Richard (DNR)" <[richard.baker@state.mn.us](mailto:richard.baker@state.mn.us)>, Nichole Bjornlie <[nichole.bjornlie@wyo.gov](mailto:nichole.bjornlie@wyo.gov)>, "Roberts, Nathan M - DNR" <[NathanM.Roberts@wisconsin.gov](mailto:NathanM.Roberts@wisconsin.gov)>

**Cc:** Jodi Bush <[jodi\\_bush@fws.gov](mailto:jodi_bush@fws.gov)>, Kurt Broderdorp <[kurt\\_broderdorp@fws.gov](mailto:kurt_broderdorp@fws.gov)>, Bryon Holt <[bryon\\_holt@fws.gov](mailto:bryon_holt@fws.gov)>, Mark McCollough <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>, Tamara Smith <[tamara\\_smith@fws.gov](mailto:tamara_smith@fws.gov)>, Mary Parkin <[mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)>, Heather Bell <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)>, Jonathan Cummings <[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)>, Seth Willey <[seth\\_willey@fws.gov](mailto:seth_willey@fws.gov)>, Justin Shoemaker <[justin\\_shoemaker@fws.gov](mailto:justin_shoemaker@fws.gov)>

All:

Attached please find the notes taken during the workshop. They have been reviewed (and in some cases amended with notes taken separately) by the SSA Core Team members. Please review these notes, make any necessary corrections and/or clarifications using "Track Changes," add any additional thoughts or considerations (on the science or workshop proceedings, not on policy/listing considerations) in the space provided at the end of this document, and return via email to [jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov) by Monday, Dec. 7, 2015.

Presentations and handouts referenced in these notes will be sent via separate emails.

We will prepare and disseminate to workshop participants a Workshop Report summarizing the proceedings and providing the Service's analysis and assessment of the information gathered at the workshop. That report will also include these notes and corrections/clarifications provided by participants.

We may also follow-up with lynx experts individually or as a group with additional questions generated by the workshop.

Let me know if you have questions.

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
[\(406\) 449-5225 ext. 220](tel:(406)449-5225-ext.220)  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

--

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

--

Nichole (Cudworth) Bjornlie  
Nongame Mammal Biologist  
Wyoming Game and Fish Department  
260 Buena Vista Drive  
Lander, WY 82520  
Phone: 307.332.7723 ext. 230  
Fax: 307.332.6669  
[nichole.bjornlie@wyo.gov](mailto:nichole.bjornlie@wyo.gov)

\*Please note change in e-mail address

E-Mail to and from me, in connection with the transaction of public business, is subject to the Wyoming Public Records Act and may be disclosed to third parties.

**From:** [Bell, Heather](#)  
**To:** [Zelenak, Jim](#); [Mary Parkin](#)  
**Subject:** Re: Canada Lynx Expert Elicitation Workshop Notes  
**Date:** Wednesday, November 25, 2015 7:23:59 AM

---

YIPEE! Jim, take tomorrow off, you deserve it! Mary, you too. :-)  
Happy thanksgiving

Heather Bell  
Ecological Services HQ  
Branch of Conservation Integration  
SSA Framework Team Lead  
Remotely Located at  
134 S. Union Blvd  
Lakewood, CO 80228  
303-236-4514

Check it out! SSA Framework - Google Site for Staff  
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>

On Tue, Nov 24, 2015 at 1:22 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

All:

Attached please find the notes taken during the workshop. They have been reviewed (and in some cases amended with notes taken separately) by the SSA Core Team members. Please review these notes, make any necessary corrections and/or clarifications using "Track Changes," add any additional thoughts or considerations (on the science or workshop proceedings, not on policy/listing considerations) in the space provided at the end of this document, and return via email to [jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov) by Monday, Dec. 7, 2015.

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We will prepare and disseminate to workshop participants a Workshop Report summarizing the proceedings and providing the Service's analysis and assessment of the information gathered at the workshop. That report will also include these notes and corrections/clarifications provided by participants.

We may also follow-up with lynx experts individually or as a group with additional questions generated by the workshop.

Let me know if you have questions.

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Mark McCollough](#); [Tamara Smith](#); [Bryon Holt](#); [Kurt Broderdorp](#)  
**Cc:** [Mary Parkin](#); [Heather Bell](#); [Jonathan Cummings](#); [Jodi Bush](#); [Seth Willey](#)  
**Subject:** Follow-up questions from EE Workshop  
**Date:** Monday, November 30, 2015 9:59:37 AM

---

Hi All:

I've started a list of follow-up questions based on my review of the notes - they are posted on the Lynx SSA drive under Workshop Materials>Workshop Notes. I may add a few more at some point.

I'd like to invite the core team and others to add any other questions or areas in need of clarification that the notes or time to reflect since the workshop may have generated. I'm not sure whether we will send individual questions to particular participants or send the whole list to all experts or participants - I welcome your thoughts on that, too.

Thanks.

--

Jim Zelenak, Biologist  
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(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** McCollough, Mark  
**To:** [Jen Vashon](#); [Laury Zicari](#); [Lowell Whitney](#)  
**Subject:** Successfully downloaded ITP  
**Date:** Monday, November 30, 2015 10:01:11 AM  
**Attachments:** [Lynx ITP submitted to USFWS on 10\\_28\\_14 with FINAL minor amendments 09242015.pdf](#)

---

Jen: Thanks for the hint. I found your email in my spam folder for some reason. After some experimenting in Dropbox I was able to download it as a pdf, which I will share here with Laury and Lowell.

I also received your email with the take reports from the 3 lynx trapped earlier this fall.

Thanks, Mark

--

Mark McCollough, Ph.D.  
Endangered Species Specialist  
Maine Field Office  
U. S. Fish and Wildlife Service  
17 Godfrey Drive, Suite 2  
Orono, ME 04473  
Phone 207 866-3344 x115  
Cell Phone: 207 944-5709  
[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Mark McCollough](#); [Tamara Smith](#); [Bryon Holt](#); [Kurt Broderdorp](#)  
**Cc:** [Mary Parkin](#); [Heather Bell](#); [Jonathan Cummings](#); [Jodi Bush](#); [Seth Willey](#)  
**Subject:** Follow-up questions from EE Workshop  
**Date:** Monday, November 30, 2015 11:59:40 AM

---

Hi All:

I've started a list of follow-up questions based on my review of the notes - they are posted on the Lynx SSA drive under Workshop Materials>Workshop Notes. I may add a few more at some point.

I'd like to invite the core team and others to add any other questions or areas in need of clarification that the notes or time to reflect since the workshop may have generated. I'm not sure whether we will send individual questions to particular participants or send the whole list to all experts or participants - I welcome your thoughts on that, too.

Thanks.

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)



**From:** Phifer, Paul  
**To:** [Zicari, Laury](mailto:Zicari.Laury)  
**Subject:** Re: Notice of upcoming request: Cooperation with Canada  
**Date:** Monday, November 30, 2015 2:20:19 PM

---

thanks

---

Paul Phifer, PhD  
Assistant Regional Director - Ecological Services  
Northeast Region  
Dept of the Interior  
US Fish and Wildlife Service  
413.253.8698 work  
413.687.4764 cell

On Mon, Nov 30, 2015 at 9:41 AM, Zicari, Laury <[laury\\_zicari@fws.gov](mailto:laury_zicari@fws.gov)> wrote:

- Jeff Bowman from the University of Trent/joint appointment with the Province of Ontario participated in the lynx expert workshop for the lynx SSA, in Minnesota, back in October. He gave a talk on the status of lynx in Canada and interconnectivity of populations with those of the U.S., including genetics work, climate change information and snow pack data.
- Mark McCollough has also been in touch with Don McAlpine of New Brunswick Museum, concerning wolves in the Northeast.
- Maine Bat Working Group (affiliated with the Maine Chapter of the Wildlife Society) is planning a workshop in Maine in April 2016 with adjoining Canadian Provinces.
- Steve Shepard was invited to present (and did so) at the American eel symposium with researchers from Canada and the UK.
- For the eel listing, Steve carefully reviewed the COSEWIC work on American eel status when completing the status review of the species..

On Sun, Nov 29, 2015 at 8:03 PM, Phifer, Paul <[paul\\_phifer@fws.gov](mailto:paul_phifer@fws.gov)> wrote:

Krishna and WNS folks - can I get a few bullets on how we are coordinating with Canada? Krishna, I am thinking red knot. Laury and Tom, anything to add? We need something by the end of Monday. Please let me know if you have something. Just a short bullet or two.

---

Paul Phifer, PhD  
Assistant Regional Director - Ecological Services  
Northeast Region  
Dept of the Interior  
US Fish and Wildlife Service  
413.253.8698 work  
413.687.4764 cell

----- Forwarded message -----

**From:** **Wendi Weber** <[wendi\\_weber@fws.gov](mailto:wendi_weber@fws.gov)>  
**Date:** Sat, Nov 21, 2015 at 7:52 AM  
**Subject:** Re: Notice of upcoming request: Cooperation with Canada  
**To:** "[FW5\\_Regional\\_Directorate@fws.gov](mailto:FW5_Regional_Directorate@fws.gov)" <[FW5\\_Regional\\_Directorate@fws.gov](mailto:FW5_Regional_Directorate@fws.gov)>

Revised deadline just came- please now have your responses to us by Nov 30. We need to have it to HQ by noon 12/1. Thank you

Wendi Weber  
Regional Director, Northeast Region  
U.S. Fish and Wildlife Service  
Hadley, MA 01035  
[Wendi\\_Weber@fws.gov](mailto:Wendi_Weber@fws.gov)  
work (413)253-8300  
cell (413)531-5163

On Nov 21, 2015, at 7:48 AM, Wendi Weber <[wendi\\_weber@fws.gov](mailto:wendi_weber@fws.gov)> wrote:

Please send Kathy and copy me on some bullets by Tues on areas where you are working with Canada- especially ES, SA, FR, and MB. Thank you

Kathy will you please compile responses and forward to me by COB Tuesday. Thank you

Wendi Weber  
Regional Director, Northeast Region  
U.S. Fish and Wildlife Service  
Hadley, MA 01035  
[Wendi\\_Weber@fws.gov](mailto:Wendi_Weber@fws.gov)  
work (413)253-8300  
cell (413)531-5163

Begin forwarded message:

**From:** "Bell, Gloria" <[gloria\\_bell@fws.gov](mailto:gloria_bell@fws.gov)>  
**Date:** November 20, 2015 at 9:00:53 AM EST  
**To:** Bryan Arroyo <[bryan\\_arroyo@fws.gov](mailto:bryan_arroyo@fws.gov)>  
**Cc:** Geoff Haskett <[geoff\\_haskett@fws.gov](mailto:geoff_haskett@fws.gov)>, Robyn Thorson <[Robyn\\_Thorson@fws.gov](mailto:Robyn_Thorson@fws.gov)>, [tom\\_melius@fws.gov](mailto:tom_melius@fws.gov), Wendi Weber <[wendi\\_weber@fws.gov](mailto:wendi_weber@fws.gov)>, Karen Clark <[karen\\_clark@fws.gov](mailto:karen_clark@fws.gov)>, Rich Hannan <[richard\\_hannan@fws.gov](mailto:richard_hannan@fws.gov)>, Charles Wooley <[charles\\_wooley@fws.gov](mailto:charles_wooley@fws.gov)>, Deb Rocque <[deborah\\_rocque@fws.gov](mailto:deborah_rocque@fws.gov)>  
**Subject: Re: Notice of upcoming request: Cooperation with Canada**

Hello everyone,

We don't have a due date yet, but let's say by COB Tuesday.

We'll forward more details as soon as we get them.

Thanks,  
gloria

Gloria Bell  
Deputy Assistant Director  
International Affairs Program  
U.S. Fish and Wildlife Service  
5275 Leesburg Pike, MS: IA  
Falls Church, VA 22041-3803  
703/358-1767

[www.fws.gov/international](http://www.fws.gov/international)

*Sign up for our e-newsletter to learn how we're working around the globe to protect species and their habitats!*



On Fri, Nov 20, 2015 at 8:56 AM, Bryan Arroyo

<[bryan\\_arroyo@fws.gov](mailto:bryan_arroyo@fws.gov)> wrote:

Folks

Love to have your input on ideas and priorities for you and see how we can include it in our response to the Dept. Gloria when do you think we need to have this additional input?

Thanks,  
Bryan

Sent from my iPhone

Begin forwarded message:

**From:** "Close, Ryan" <[ryan\\_close@ios.doi.gov](mailto:ryan_close@ios.doi.gov)>

**Date:** November 19, 2015 at 5:20:49 PM EST

**To:** Jonathan Putnam

<[jonathan\\_putnam@nps.gov](mailto:jonathan_putnam@nps.gov)>, Stephen Morris

<[stephen\\_morris@nps.gov](mailto:stephen_morris@nps.gov)>, Gloria Bell

<[gloria\\_bell@fws.gov](mailto:gloria_bell@fws.gov)>, Bryan Arroyo

<[bryan\\_arroyo@fws.gov](mailto:bryan_arroyo@fws.gov)>, Eric Wilson

<[Eric.Wilson@bia.gov](mailto:Eric.Wilson@bia.gov)>, Colin Strylowski

<[cstrylowski@blm.gov](mailto:cstrylowski@blm.gov)>, Julie Fleming

<[Julie.Fleming@bsee.gov](mailto:Julie.Fleming@bsee.gov)>, Emily Lindow

<[emily.lindow@boem.gov](mailto:emily.lindow@boem.gov)>, Victor Labson

<[vlabson@usgs.gov](mailto:vlabson@usgs.gov)>, Mary Josie Blanchard

<[maryjosie\\_blanchard@ios.doi.gov](mailto:maryjosie_blanchard@ios.doi.gov)>

**Cc:** David Downes <[david\\_downes@ios.doi.gov](mailto:david_downes@ios.doi.gov)>, Teresa Stoepler <[teresa\\_stoepler@ios.doi.gov](mailto:teresa_stoepler@ios.doi.gov)>  
**Subject: Notice of upcoming request: Cooperation with Canada**

Good evening all,

As you know, Canada has a new government. If you're interested in the new government's priorities, the Prime Minister's mandate letters make for interesting reading:  
<http://pm.gc.ca/eng/ministerial-mandate-letters>

The new government has made it clear it will devote a lot of energy to the U.S.-Canada relationship. The USG is interested in making the most of this opportunity, and there will be considerable high-level focus on our bilateral activities.

Please be aware that **the White House will very soon (in the next few days) request agency input on key ongoing cooperation as well as ideas for new areas of cooperation.** They are particularly interested in identifying activities that can capitalize on the new government's emphasis on environmental issues. When this request comes out, we'll only have a few days to respond (holidays notwithstanding). This will feed into high-level deliberations at the NSC and across agencies.

**Leadership will be looking for input from each of your bureaus.** I'll share more details as soon as they are available, but I wanted to give you as much notice as possible.

Thanks,  
Ryan

[Ryan Close](#)  
Office of International Affairs  
U.S. Department of the Interior  
(202) 208-3004  
[www.doi.gov/intl](http://www.doi.gov/intl)

--

Laury Zicari  
Field Supervisor  
Maine Field Office  
17 Godfrey Drive, Suite 2  
Orono, ME 04473  
207-866-3344 x 1111  
Fax 866-3351  
Cell 207-949-0561

**From:** [Parkin, Mary](#)  
**To:** [Jim Zelenak](#)  
**Subject:** R5 folks on today SSA FWS coordination call  
**Date:** Tuesday, December 01, 2015 7:55:45 AM

---

Hi Jim,

I mentioned this call in our ES staff meeting this morning, and both our ARD and outreach lead expressed an interest in listening in. Would this be ok? If not, especially for the ARD, I'll let them know that I can catch them up afterwards.

Thanks,  
Mary

--

*Mary Parkin*  
*Endangered Species Recovery Coordinator, Northeast Region*  
*U.S. Fish and Wildlife Service, Hadley, MA*  
*Remotely located in Escalante, Utah:*  
*Mailing address PO Box 637, Escalante, UT 84726*  
*Street address 145 North Center St, Escalante, UT 84726*  
*Phone 617-417-3331*  
*Email [mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)*

**From:** [Zelenak, Jim](#)  
**To:** [Mark McCollough](#)  
**Subject:** Fwd: Lynx expert elicitation workshop report  
**Date:** Tuesday, December 01, 2015 12:10:01 PM

---

As we discussed, Mark. You might want to check with Jonathan about using the Maine persistence graph in your presentation for the forest group there.

Jim

----- Forwarded message -----

**From:** **Cummings, Jonathan** <[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)>  
**Date:** Tue, Dec 1, 2015 at 11:32 AM  
**Subject:** Lynx expert elicitation workshop report  
**To:** David Smith <[drsmith@usgs.gov](mailto:drsmith@usgs.gov)>  
**Cc:** Mary Parkin <[mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)>, Heather Bell <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)>, Jim Zelenak <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>

Hi Dave,

Would you have some time to take a quick look over the workshop report we're putting together from the Lynx expert elicitation workshop? We're mainly looking for an overall impression if there is anything that jumps out as being circumspect, or the direction we are taking in summarizing responses is problematic. I think we've captured things well, but I do have a question about the figures I put together that combine the p(persistence) responses from each geographic unit (see p. 19).

Currently they only use the median from the individual geographic unit responses. Heather asked Mike Thabault about the figure and he said it's good, but needs uncertainty bounds. I had been thinking this myself. Any thoughts about the best way to do that? I could take the extreme geographic unit responses, the median of the most and least likely responses, or do some sort of boot-strapping from the individual responses. Any thoughts about the best way to present a summary figure while account for the uncertainty in the individual geographic units would be great.



[Lynx SSA EE Workshop Report](#)

I've cc'd Jim, Heather, and Mary as they'll know the time frame we're aiming to complete the workshop report by and in case they have specific questions.

While I'm writing you all I have one more question: Would a short write up of this elicitation, in particular the analysis the probability of persistence and the production of those figures be worth attempting to publish? Perhaps in Wildlife Society Bulletin or Wildlife Biology or the like?

Thanks,  
Jonathan

--

Jonathan W. Cummings, PhD  
Research Ecologist  
USGS - Patuxent Wildlife Research Center (remotely located)  
12100 Beech Forest Road  
Laurel, MD 20708 USA  
[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)  
<https://profile.usgs.gov/jwcummings>

Remote Contact Info:  
Ph: 802-999-8684  
243 Locust St  
Dover, NH 03820

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)



**From:** [Zelenak, Jim](#)  
**To:** [Mark McCollough](#)  
**Subject:** Fwd: C lynx and EPM RN  
**Date:** Tuesday, December 01, 2015 12:27:01 PM

---

FYI. We will need to talk to Heather and Tara about how this does or does not help with what we need for the SSA.

----- Forwarded message -----

**From:** **Zelenak, Jim** <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>  
**Date:** Tue, Dec 1, 2015 at 10:53 AM  
**Subject:** Re: C lynx and EPM RN  
**To:** "Bell, Heather" <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)>  
**Cc:** Mary\_Parkin <[Mary\\_Parkin@fws.gov](mailto:Mary_Parkin@fws.gov)>, "Cummings, Jonathan" <[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)>

I believe that some time while I was frantically working on the CH rules, Mark let me know that they had someone there working on effects pathways for ECOS - think it was John Hosanna - and did I have time to work with him or review some of what he had put together.

I did not.....

On Tue, Dec 1, 2015 at 10:35 AM, Bell, Heather <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)> wrote:

Jim, it looks like there has been some work done on individual needs already. we don't want to redo what has already been done so we are trying to get a hold of the work in ipac. do you have the raw info?

Heather Bell  
Ecological Services HQ  
Branch of Conservation Integration  
SSA Framework Team Lead  
Remotely Located at  
134 S. Union Blvd  
Lakewood, CO 80228  
303-236-4514

Check it out! SSA Framework - Google Site for Staff  
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google  
Site: <https://sites.google.com/a/fws.gov/rev/>

----- Forwarded message -----

**From:** **Nicolaysen, Tara** <[tara\\_nicolaysen@fws.gov](mailto:tara_nicolaysen@fws.gov)>  
**Date:** Tue, Dec 1, 2015 at 9:18 AM  
**Subject:** C lynx and EPM RN  
**To:** Heather Bell <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)>  
**Cc:** Chris Tanner <[chris\\_tanner@fws.gov](mailto:chris_tanner@fws.gov)>

Hi Heather

Here's what I could find out about Lynx RN in EPM. I will do some sleuthing to find out who Erin

S. worked with (the student intern). Laury Zicari is Field Supervisor. Chris may have something to add!

Note that these RN are unpublished - meaning that only Montana can see them (don't know why I can't see them if I log in as a Maine biologist...I thought delegate offices could see everything the lead office sees...

Tara

--

**Tara Nicolaysen**  
Ecological Services  
HQ Branch of Conservation Integration

remotely located in R6 RO  
134 Union Blvd.  
Lakewood, CO 80228

General work schedule: Work from home MWF, in office TTH

**303-902-7371 (cell)**

303-236-4259 (office)

703-657-9585 (cell)

**Check these out!**

- SSA Framework - google site for FWS staff: <https://sites.google.com/a/fws.gov/ssa/>
- REV google site for FWS staff: <https://sites.google.com/a/fws.gov/rev/>

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601

(406) 449-5225 ext. 220

[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Bell, Heather](#)  
**To:** [Mark McCollough](#); [Mary Parkin](#)  
**Subject:** Re: C lynx and EPM RN  
**Date:** Tuesday, December 01, 2015 1:26:21 PM

---

Actually i am getting Chris Tanner to do this! he will send it to me and i will put it on the google drive for us all to review. that way we don't need to redo the work that has already been done!

Heather Bell  
Ecological Services HQ  
Branch of Conservation Integration  
SSA Framework Team Lead  
Remotely Located at  
134 S. Union Blvd  
Lakewood, CO 80228  
303-236-4514

Check it out! SSA Framework - Google Site for Staff  
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>

On Tue, Dec 1, 2015 at 11:18 AM, Bell, Heather <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)> wrote:

Mark/Mary, can we get a hold of the ipac info for Lynx. was it done in a spread sheet first? if so, can we see that? i want to make sure we are not "redoing" work that has already been done!

Heather Bell  
Ecological Services HQ  
Branch of Conservation Integration  
SSA Framework Team Lead  
Remotely Located at  
134 S. Union Blvd  
Lakewood, CO 80228  
303-236-4514

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at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google  
Site: <https://sites.google.com/a/fws.gov/rev/>

----- Forwarded message -----

**From:** **Zelenak, Jim** <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>  
**Date:** Tue, Dec 1, 2015 at 10:53 AM  
**Subject:** Re: C lynx and EPM RN  
**To:** "Bell, Heather" <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)>  
**Cc:** Mary\_Parkin <[Mary\\_Parkin@fws.gov](mailto:Mary_Parkin@fws.gov)>, "Cummings, Jonathan" <[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)>

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Heather Bell  
Ecological Services HQ  
Branch of Conservation Integration  
SSA Framework Team Lead  
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at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google  
Site: <https://sites.google.com/a/fws.gov/rev/>

----- Forwarded message -----

From: **Nicolaysen, Tara** <[tara\\_nicolaysen@fws.gov](mailto:tara_nicolaysen@fws.gov)>  
Date: Tue, Dec 1, 2015 at 9:18 AM  
Subject: C lynx and EPM RN  
To: Heather Bell <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)>  
Cc: Chris Tanner <[chris\\_tanner@fws.gov](mailto:chris_tanner@fws.gov)>

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Tara

--

**Tara Nicolaysen**  
Ecological Services  
HQ Branch of Conservation Integration

remotely located in R6 RO  
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Lakewood, CO 80228

General work schedule: Work from home MWF, in office TTH

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703-657-9585 (cell)

**Check these out!**

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- REV google site for FWS staff: <https://sites.google.com/a/fws.gov/rev/>

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
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Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](mailto:Zelenak, Jim)  
**To:** [Mark McCollough](mailto:Mark McCollough)  
**Subject:** Fwd: Call participation  
**Date:** Tuesday, December 01, 2015 1:30:32 PM

---

Because you were on the call, you probably shouldn't be excluded from this string of messages....

----- Forwarded message -----

**From:** **Parkin, Mary** <[mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)>  
**Date:** Tue, Dec 1, 2015 at 11:25 AM  
**Subject:** Re: Call participation  
**To:** "Zelenak, Jim" <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>  
**Cc:** "Smith, Tamara" <[tamara\\_smith@fws.gov](mailto:tamara_smith@fws.gov)>, "Holt, Bryon" <[bryon\\_holt@fws.gov](mailto:bryon_holt@fws.gov)>

I know I do!

On Tue, Dec 1, 2015 at 1:16 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

OK - you all have made me feel much better. And I think you're right, Tam - they have complete confidence in the lynx teams!

On Tue, Dec 1, 2015 at 11:11 AM, Smith, Tamara <[tamara\\_smith@fws.gov](mailto:tamara_smith@fws.gov)> wrote:

I agree with Bryon and Mary - probably just a combination of time of year and conflicting priorities. I think including an agenda with the calendar invite is a great idea - just a brief one may help spark some interest.

Maybe everyone is just super confident in the SSA team's abilities, and simply thinking "Jim has got this - no sweat!"

-Tam

On Tue, Dec 1, 2015 at 11:55 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Well, I do strive for mundane, at least when I'm not actively pursuing inane.....

On Tue, Dec 1, 2015 at 10:52 AM, Holt, Bryon <[bryon\\_holt@fws.gov](mailto:bryon_holt@fws.gov)> wrote:

Jim,

I agree with Mary - definitely not a commentary on your game show host skills - but is most likely a matter of competing priorities and a judgement that this is/was a rather routine, mundane update.

Bryon

On Tue, Dec 1, 2015 at 9:42 AM, Parkin, Mary <[mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)> wrote:

Here are my guesses: Use or lose, process-oriented info, everyone being over-committed, multi-tasking. I do wonder whether some of the RO folks/project leaders consider this a pro forma call and are waiting for the big, controversial issues to come up.

One other thing is that this particular call came before the State coordination call, so no download there for our managers. We have problems with holiday schedules in this regard, but in early 2016, could we make sure this sequence holds?

Another point in this regard: I had a few folks mention to me that a call agenda would allow them to gauge their need to attend, so perhaps we should add this to the calendar entries if possible.

Definitely not a commentary on your game-show-host skills, Jim!

Cheers,  
Mary

On Tue, Dec 1, 2015 at 12:30 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Are we losing interest in lynx? Only 2 other people on the call besides us - do I need to do something to increase interest/liven it up a little? Maybe a raffle? Guess I didn't miss my calling as a game show host (contrary to what an undergrad colleague told me years ago...).

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

--

Mary Parkin  
Endangered Species Recovery Coordinator, Northeast Region  
U.S. Fish and Wildlife Service, Hadley, MA  
Remotely located in Escalante, Utah:  
Mailing address PO Box 637, Escalante, UT 84726  
Street address 145 North Center St, Escalante, UT 84726  
Phone 617-417-3331  
Email [mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)

--

\*\*\*\*\*

Bryon Holt  
U.S. Fish and Wildlife Service  
Northern Idaho Field Office, Spokane, WA  
Telephone: (509) 893-8014  
Fax: (509) 891-6748  
email: [bryon\\_holt@fws.gov](mailto:bryon_holt@fws.gov)



\*\*\*\*\*

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
Montana Ecological Services Office  
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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

--

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Bloomington, MN 55425  
612-725-3548 ext. 2219  
612-600-1599 cell

--

Jim Zelenak, Biologist  
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*Mary Parkin*  
*Endangered Species Recovery Coordinator, Northeast Region*  
*U.S. Fish and Wildlife Service, Hadley, MA*  
*Remotely located in Escalante, Utah:*  
*Mailing address PO Box 637, Escalante, UT 84726*  
*Street address 145 North Center St, Escalante, UT 84726*  
*Phone 617-417-3331*  
*Email [mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)*

--

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Mark McCollough](#)  
**Subject:** Fwd: Lynx expert elicitation workshop report  
**Date:** Tuesday, December 01, 2015 2:10:03 PM

---

As we discussed, Mark. You might want to check with Jonathan about using the Maine persistence graph in your presentation for the forest group there.

Jim

----- Forwarded message -----

**From:** **Cummings, Jonathan** <[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)>  
**Date:** Tue, Dec 1, 2015 at 11:32 AM  
**Subject:** Lynx expert elicitation workshop report  
**To:** David Smith <[drsmith@usgs.gov](mailto:drsmith@usgs.gov)>  
**Cc:** Mary Parkin <[mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)>, Heather Bell <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)>, Jim Zelenak <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>

Hi Dave,

Would you have some time to take a quick look over the workshop report we're putting together from the Lynx expert elicitation workshop? We're mainly looking for an overall impression if there is anything that jumps out as being circumspect, or the direction we are taking in summarizing responses is problematic. I think we've captured things well, but I do have a question about the figures I put together that combine the p(persistence) responses from each geographic unit (see p. 19).

Currently they only use the median from the individual geographic unit responses. Heather asked Mike Thabault about the figure and he said it's good, but needs uncertainty bounds. I had been thinking this myself. Any thoughts about the best way to do that? I could take the extreme geographic unit responses, the median of the most and least likely responses, or do some sort of boot-strapping from the individual responses. Any thoughts about the best way to present a summary figure while account for the uncertainty in the individual geographic units would be great.

 [Lynx SSA EE Workshop Report](#)

I've cc'd Jim, Heather, and Mary as they'll know the time frame we're aiming to complete the workshop report by and in case they have specific questions.

While I'm writing you all I have one more question: Would a short write up of this elicitation, in particular the analysis the probability of persistence and the production of those figures be worth attempting to publish? Perhaps in Wildlife Society Bulletin or Wildlife Biology or the like?

Thanks,  
Jonathan

--

Jonathan W. Cummings, PhD  
Research Ecologist  
USGS - Patuxent Wildlife Research Center (remotely located)  
12100 Beech Forest Road  
Laurel, MD 20708 USA  
[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)  
<https://profile.usgs.gov/jwcummings>

Remote Contact Info:  
Ph: 802-999-8684  
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Dover, NH 03820

--

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Helena, MT 59601  
(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Mark McCollough](#)  
**Subject:** Fwd: C lynx and EPM RN  
**Date:** Tuesday, December 01, 2015 2:27:04 PM

---

FYI. We will need to talk to Heather and Tara about how this does or does not help with what we need for the SSA.

----- Forwarded message -----

**From:** **Zelenak, Jim** <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>  
**Date:** Tue, Dec 1, 2015 at 10:53 AM  
**Subject:** Re: C lynx and EPM RN  
**To:** "Bell, Heather" <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)>  
**Cc:** Mary\_Parkin <[Mary\\_Parkin@fws.gov](mailto:Mary_Parkin@fws.gov)>, "Cummings, Jonathan" <[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)>

I believe that some time while I was frantically working on the CH rules, Mark let me know that they had someone there working on effects pathways for ECOS - think it was John Hosanna - and did I have time to work with him or review some of what he had put together.

I did not.....

On Tue, Dec 1, 2015 at 10:35 AM, Bell, Heather <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)> wrote:

Jim, it looks like there has been some work done on individual needs already. we don't want to redo what has already been done so we are trying to get a hold of the work in ipac. do you have the raw info?

Heather Bell  
Ecological Services HQ  
Branch of Conservation Integration  
SSA Framework Team Lead  
Remotely Located at  
134 S. Union Blvd  
Lakewood, CO 80228  
303-236-4514

Check it out! SSA Framework - Google Site for Staff  
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google  
Site: <https://sites.google.com/a/fws.gov/rev/>

----- Forwarded message -----

**From:** **Nicolaysen, Tara** <[tara\\_nicolaysen@fws.gov](mailto:tara_nicolaysen@fws.gov)>  
**Date:** Tue, Dec 1, 2015 at 9:18 AM  
**Subject:** C lynx and EPM RN  
**To:** Heather Bell <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)>  
**Cc:** Chris Tanner <[chris\\_tanner@fws.gov](mailto:chris_tanner@fws.gov)>

Hi Heather

Here's what I could find out about Lynx RN in EPM. I will do some sleuthing to find out who Erin

S. worked with (the student intern). Laury Zicari is Field Supervisor. Chris may have something to add!

Note that these RN are unpublished - meaning that only Montana can see them (don't know why I can't see them if I log in as a Maine biologist...I thought delegate offices could see everything the lead office sees...

Tara

--

**Tara Nicolaysen**  
Ecological Services  
HQ Branch of Conservation Integration

remotely located in R6 RO  
134 Union Blvd.  
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General work schedule: Work from home MWF, in office TTH

**303-902-7371 (cell)**

303-236-4259 (office)

703-657-9585 (cell)

**Check these out!**

- SSA Framework - google site for FWS staff: <https://sites.google.com/a/fws.gov/ssa/>
- REV google site for FWS staff: <https://sites.google.com/a/fws.gov/rev/>

--

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--

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Smith, David](#)  
**To:** [Cummings, Jonathan](#)  
**Cc:** [Mary Parkin](#); [Heather Bell](#); [Jim Zelenak](#)  
**Subject:** Re: Lynx expert elicitation workshop report  
**Date:** Tuesday, December 01, 2015 5:53:42 PM

---

Jonathan,

I'll review the workshop report. I can give a quick look and comments by end of the week. Anything requiring more in depth would take at least 2 weeks cause next week is booked and I'm at a review panel til Thursday.

As to the question re publication, my initial answer is definitely consider it. I'll send you a pre-print by colleaues of Runge and Burgman that could serve as a model.

Dave

David R. Smith  
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304-724-4467  
<https://profile.usgs.gov/drsmith>  
[ResearchGate profile](#)

On Tue, Dec 1, 2015 at 1:32 PM, Cummings, Jonathan <[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)> wrote:

Hi Dave,

Would you have some time to take a quick look over the workshop report we're putting together from the Lynx expert elicitation workshop? We're mainly looking for an overall impression if there is anything that jumps out as being circumspect, or the direction we are taking in summarizing responses is problematic. I think we've captured things well, but I do have a question about the figures I put together that combine the p(persistence) responses from each geographic unit (see p. 19).

Currently they only use the median from the individual geographic unit responses. Heather asked Mike Thabault about the figure and he said it's good, but needs uncertainty bounds. I had been thinking this myself. Any thoughts about the best way to do that? I could take the extreme geographic unit responses, the median of the most and least likely responses, or do some sort of boot-strapping from the individual responses. Any thoughts about the best way to present a summary figure while account for the uncertainty in the individual geographic units would be great.

 [Lynx SSA EE Workshop Report](#)

I've cc'd Jim, Heather, and Mary as they'll know the time frame we're aiming to complete the workshop report by and in case they have specific questions.



While I'm writing you all I have one more question: Would a short write up of this elicitation, in particular the analysis the probability of persistence and the production of those figures be worth attempting to publish? Perhaps in Wildlife Society Bulletin or Wildlife Biology or the like?

Thanks,  
Jonathan

--

Jonathan W. Cummings, PhD  
Research Ecologist  
USGS - Patuxent Wildlife Research Center (remotely located)  
12100 Beech Forest Road  
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[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)  
<https://profile.usgs.gov/jwcummings>

Remote Contact Info:  
Ph: 802-999-8684  
243 Locust St  
Dover, NH 03820

**From:** [Bell, Heather](#)  
**To:** [Jim Zelenak](#); [Mary Parkin](#); [Cummings, Jonathan](#)  
**Subject:** Lynx workshop report, please read and provide comments on google drive before Monday!  
**Date:** Wednesday, December 02, 2015 10:25:25 AM

---

Hey Team, we have some great stuff in the report already and as a team i would like to discuss what else we need to do to get it in final draft form this coming monday! (do you hear the whip cracking in the background!).

1. Everyone review it and provide thoughts, comments on the google drive.  
<https://docs.google.com/document/d/1mBF2YvZbFSLGtey3iU4l-NU-QUXPhXz3n3eDMxjIqjE/edit>
2. Jonathan has asked Dave for input, we shall see what we have by monday.
3. Heather is getting another expert elicitation workshop report to use as an example. .

Heather Bell  
Ecological Services HQ  
Branch of Conservation Integration  
SSA Framework Team Lead  
Remotely Located at  
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Check it out! SSA Framework - Google Site for Staff  
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>

**From:** [Jodi Bush](#)  
**To:** [Zelenak, Jim](#)  
**Subject:** Re: State lynx call  
**Date:** Wednesday, December 02, 2015 11:12:18 AM

---

Ok

Sent from my iPhone

On Dec 2, 2015, at 11:11 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Just realized I goofed and told all our State partners that the call would be at 1:30 today (instead of usual 1:00). Think it is better that we (FWS) adjust rather than changing the start time for States at this stage. Have asked Mary to re-send a correct invite to FWS/USGS folks (only 12, as compared to dozens of State folks), so anticipate the call will start at 1:30 MST.

--

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Mark McCollough](#)  
**To:** [jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)  
**Cc:** [Laury Zicari](#)  
**Subject:** Good job with meeting  
**Date:** Wednesday, December 02, 2015 2:10:35 PM

---

Good job handling questions on the call today. Most of maine's largest forest mgmt companies were present at our meeting today. After explaining the ssa process and timeline,they wanted to know if we would be considering a separate dos for Maine and what opportunities they would have to provide input on the ssa and possible recovery plan. I did my best to answer based on our discussion yesterday.

Sent from my iPhone

**From:** [Mark McCollough](#)  
**To:** [jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)  
**Cc:** [Laury Zicari](#)  
**Subject:** Good job with meeting  
**Date:** Wednesday, December 02, 2015 4:10:32 PM

---

Good job handling questions on the call today. Most of maine's largest forest mgmt companies were present at our meeting today. After explaining the ssa process and timeline,they wanted to know if we would be considering a separate dos for Maine and what opportunities they would have to provide input on the ssa and possible recovery plan. I did my best to answer based on our discussion yesterday.

Sent from my iPhone

**From:** [Zelenak, Jim](#)  
**To:** [Parkin, Mary](#)  
**Cc:** [Heather Bell](#); [Jonathan Cummings](#)  
**Subject:** Re: apologies for missing a few calls this week  
**Date:** Thursday, December 03, 2015 9:34:13 AM

---

No worries, Mary. You are plenty busy and plenty on the ball!

The State call was kind of brief (25 min. or so, I think) and went pretty well. Couple questions from Maine and Minn. on process - looking for opportunities to influence ultimate FWS determinations and/or understand their potential roles in the SSA, 5-year review, and recovery planning. Maybe also looking for some way to rekindle the multi-DPSs idea.

Sorry you couldn't make it, but Seth and Heather helped answer/clarify responses to questions from the States. I did indicate that our next call will be last Wed. of Jan., and that they will have likely seen the workshop report by then. That reminds me that I didn't get back to you on your call-scheduling email - I'll do that today.

Hope all is well.

Jim

On Thu, Dec 3, 2015 at 7:59 AM, Parkin, Mary <[mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)> wrote:

Hi all,

I'm afraid this hasn't been my most efficient week in terms of lynx. To cap it off, I had to be on the road yesterday during the State coord call, and instead of going to the calendar I used our weekly lynx info to call in from the car (I was a passenger!) -- no go on that, of course.

Was anything of note discussed during the State call? If so, I'll try to catch up with one of you about it. And I hope to be more on the ball next week!

Onward,  
Mary

--

*Mary Parkin*  
*Endangered Species Recovery Coordinator, Northeast Region*  
*U.S. Fish and Wildlife Service, Hadley, MA*  
*Remotely located in Escalante, Utah:*  
*Mailing address PO Box 637, Escalante, UT 84726*  
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--

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Helena, MT 59601  
(406) 449-5225 ext. 220

[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Mark McCollough](#)  
**Subject:** Re: Northern Woodlands magazine: "Lynx on the Move" article pdf  
**Date:** Thursday, December 03, 2015 2:09:57 PM

---

Figure 8.1 in McKelvey shows 9 lynx pelts from NH from about 1959-1964, and these are footnoted in Table 8.1 as "confirmed reliability" records, so maybe I was being overly harsh on that point.

On Thu, Dec 3, 2015 at 1:58 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

"*Lynx canadensis*, North America's only lynx species." - NOT. *Lynx rufus* anyone?

"In the White Mountains of New Hampshire, lynx records from the 1960s were mostly from above 3,280 feet in forests dominated by balsam fir and black spruce – areas that would have had substantially more snow than the valleys." - MCKELVEY ET AL. SHOW ONE VERIFIED RECORD IN NH IN THE 1960S - it is not clear whether that road-killed male was or was not "mostly above 3,280 feet."

"In the Adirondack Mountains of northern New York, the distribution of lynx – a species that's now extirpated from the state – may have been similar." - MCKELVEY ET AL. (Table 8.2) SHOW 25 verified records for NY, at least 18 of which strongly suggest dispersers during irruptions. Can something be extirpated from an area that it likely only visited occasionally and in which it likely remained only temporarily?

"And yet the forest [in Maine] is very different today than it was in 1975 – for starters, there's a lot less spruce and fir." - IS THIS TRUE, MARK? That the areal extent of spruce-fir has declined in Maine between 1975 and now?

Anyway, I talked with author briefly on this a while ago, hence the quote attributed to me. But I think some of the article (as above) is questionable.

Thought you'd be interested in this if you hadn't seen it yet. Would appreciate any thoughts you care to share. Did she talk with you at all?

----- Forwarded message -----

**From:** Cheryl Lyn Dybas <[cheryl.lyn.dybas@gmail.com](mailto:cheryl.lyn.dybas@gmail.com)>  
**Date:** Thu, Dec 3, 2015 at 11:24 AM  
**Subject:** Northern Woodlands magazine: "Lynx on the Move" article pdf  
**To:** "Zelenak, Jim" <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>

Hi, Jim, hope all is going well for you.

The Northern Woodlands magazine lynx article is just out, please see attached.

Hope you like how it turned out, and thanks so much again for all your help with it,  
Cheryl



--

Jim Zelenak, Biologist  
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**From:** [Beth Gardner](#)  
**To:** [Smith, Tamara](#)  
**Cc:** [Nathan Hostetter](#)  
**Subject:** Re: Canada lynx performance report  
**Date:** Thursday, December 03, 2015 4:29:08 PM

---

Hi Tam,

Thanks for the reminder. Nathan and I were planning to submit this occupancy report as the performance report, but I figured we'd see what folks thought about it on the call tomorrow. We'll get that report to you before Dec. 29.

We are set to spend the money from Jan - May of next year paying Nathan's salary. Despite all the work he has done, we haven't actually paid him anything yet :)

Cheers,  
Beth

On Thu, Dec 3, 2015 at 4:34 PM, Smith, Tamara <[tamara\\_smith@fws.gov](mailto:tamara_smith@fws.gov)> wrote:

Hi Beth and Nathan, I am sending this email as a reminder of the annual performance report needed for the Canada lynx that you're working on for us.

Here is the relevant excerpt from the cooperative agreement :

Recipient shall submit to the Service Project Officer an annual written performance report within 90 days following the end of each calendar year in which the agreement remains in effect. This report shall succinctly compare actual accomplishments with the objectives established for the period and will also cite the reason(s) for slippage if the objectives were not met.

That would put the due date for the perf. report at December 29. There is no specific format or forms for the report so I think it can be pretty brief - you can probably just modify the report that Nathan sent out.

Also - we are showing a balance of about \$15K on the books - are you planning to spend that down soon? My financial person will be contacting your financial person soon, but I thought I'd ask you also... The contract does not expire until Sept. 2016.

Talk to you tomorrow!

Tam

--

Tamara Smith  
U.S. Fish and Wildlife Service  
Twin Cities Field Office  
4101 American Boulevard East  
Bloomington, MN 55425

[612-725-3548](tel:612-725-3548) ext. 2219

[612-600-1599](tel:612-600-1599) cell

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Beth Gardner  
NC State University  
Department of Forestry and Environmental Resources  
5217 Jordan Hall  
Raleigh, NC 27695-7646  
Tel: 919 513-7558  
Fax: 919 515-5110

**From:** [Parkin, Mary](#)  
**To:** [Zelenak, Jim](#)  
**Cc:** [Bell, Heather](#); [Cummings, Jonathan](#)  
**Subject:** Re: i have a conflict for todays call. Have fun!  
**Date:** Monday, December 07, 2015 8:34:04 AM

---

I'll add this and other lynx calls to the calendar as soon as I get off a call I have to get on shortly. For now, yes, let's proceed with the 11 MST/1 EST call.

On Mon, Dec 7, 2015 at 9:53 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

We will try to carry on without you.

Speaking of - I don't see it on my calendar, but I think we were planning our usual call at 11 Mountain time - is that correct Mary and Jonathan?

On Mon, Dec 7, 2015 at 7:24 AM, Bell, Heather <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)> wrote:

Heather Bell  
Ecological Services HQ  
Branch of Conservation Integration  
SSA Framework Team Lead  
Remotely Located at  
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303-236-4514

Check it out! SSA Framework - Google Site for Staff  
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google  
Site: <https://sites.google.com/a/fws.gov/rev/>

--

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--

*Mary Parkin  
Endangered Species Recovery Coordinator, Northeast Region  
U.S. Fish and Wildlife Service, Hadley, MA  
Remotely located in Escalante, Utah:  
Mailing address PO Box 637, Escalante, UT 84726  
Street address 145 North Center St, Escalante, UT 84726  
Phone 617-417-3331*

Email [mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Ivan - DNR, Jake](#)  
**Subject:** Re: Lynx Expert Workshop Materials  
**Date:** Monday, December 07, 2015 10:43:48 AM

---

Thanks, Jake - appreciate it.

On Mon, Dec 7, 2015 at 10:35 AM, Ivan - DNR, Jake <[jake.ivan@state.co.us](mailto:jake.ivan@state.co.us)> wrote:

Hi Jim,

I reviewed the notes last week and have my comments ready to go. I had a few things I'm waiting to run by some people here and will send later today, assuming they get back to me. If they don't, I will send regardless.

Jake

Jake Ivan  
Wildlife Researcher  
Mammals Research Section



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On Mon, Dec 7, 2015 at 10:33 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Hi All:

Jennifer brought to my attention that her presentation as I forwarded in the zip files to all workshop participants was truncated, missing the last 8 or 9 slides. Presenters - please let me know if you have found similar issues with presentations or any of the other materials.

Also, workshop participants - please let me know if you do or do not intend to provide feedback on the workshop notes.

Thanks,  
Jim

--

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Jim Zelenak, Biologist

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Catton, Susan J -FS](#)  
**Subject:** Re: Lynx Expert Workshop Materials  
**Date:** Monday, December 07, 2015 12:06:29 PM

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That's fine, Susan - we'd still love to have your feedback then, if any. Thanks.

On Mon, Dec 7, 2015 at 11:53 AM, Catton, Susan J -FS <[scatton@fs.fed.us](mailto:scatton@fs.fed.us)> wrote:

Thanks Jim-

I will be unable to provide any feedback on the notes until Thursday Dec 10<sup>th</sup> at the earliest. If this is too late I understand. Just let me know. -Susan

**From:** Zelenak, Jim [mailto:[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)]  
**Sent:** Monday, December 07, 2015 11:34 AM  
**To:** McKelvey, Kevin -FS; Erin Simons-Legaard; Vashon, Jennifer; Ron Moen; Catton, Susan J -FS; Squires, John -FS; Jay Kolbe; Maletzke, Benjamin T (DFW); Jake Ivan - DNR; Bowman, Jeff (MNRF); Jackson, Scott -FS; Schwartz, Michael K -FS; Hodges, Karen; Josh Lawler; Wilsey, Chad; [frei001@umn.edu](mailto:frei001@umn.edu); Alexej Siren; [richard.baker@state.mn.us](mailto:richard.baker@state.mn.us); Nichole Bjornlie; Roberts, Nathan M - DNR  
**Cc:** [mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov); [Tamara\\_Smith@fws.gov](mailto:Tamara_Smith@fws.gov); [bryon\\_holt@fws.gov](mailto:bryon_holt@fws.gov); [kurt\\_broderdorp@fws.gov](mailto:kurt_broderdorp@fws.gov); Heather Bell; Jonathan Cummings; Mary Parkin; [Jodi\\_Bush@fws.gov](mailto:Jodi_Bush@fws.gov); Seth Willey  
**Subject:** Lynx Expert Workshop Materials

Hi All:

Jennifer brought to my attention that her presentation as I forwarded in the zip files to all workshop participants was truncated, missing the last 8 or 9 slides. Presenters - please let me know if you have found similar issues with presentations or any of the other materials.

Also, workshop participants - please let me know if you do or do not intend to provide feedback on the workshop notes.

Thanks,

Jim

--

Jim Zelenak, Biologist



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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

--

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Parkin, Mary](#)  
**Subject:** Re: upcoming lynx call dates  
**Date:** Monday, December 07, 2015 1:08:39 PM

---

Thanks for catching my error date - not sure what calendar I was looking at, or maybe my fingers weren't listening to my brain (or vice-versa).

On Mon, Dec 7, 2015 at 12:58 PM, Parkin, Mary <[mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)> wrote:

Hi Jim,

I added the calendar entries as you mentioned (except I made the state coord call for 1/27, which is the Wednesday). Did you let the state folks know last week that the next call would be postponed?

I need to get some lunch now, then I'll be revisiting the IPS worksheets.

Cheers,  
Mary

On Fri, Dec 4, 2015 at 12:12 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Sorry it took me so long to reply to this. My responses below.

Next 2 core team calls: **December 8 and 22** from 9:30-11 MST. - **YES**.

If we keep with the bi-weekly schedule, the third one would be **January 5**, but the time conflicts with the next FWS coord call. - Core Team calls, while "bi-weekly", are scheduled for 2nd and 4th Tuesdays of each month. So, let's just have the FWS-wide coordination call on Jan. 5, and have the **Core Team calls on Jan. 12 and 26**.

Next FWS coord call: **January 5**, 10-11 MST. - **YES**.

Next State coord call (after tomorrow): **December 30**, 1-2:30 MST -- this date could be problematic; should we schedule for **January 6** instead? - **Jodi and I discussed and decided to skip the Dec. 30 call and just have next state call on last Wed. of Jan., so the 26th**.

Thanks! Let me know if you have any other questions.

On Tue, Dec 1, 2015 at 10:27 AM, Parkin, Mary <[mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)> wrote:

Hi Jim,

Short and sweet, nice!

While it's on my mind, thought I'd set up the Google calendar dates for the next core team and monthly calls. Since these will span the holiday season, would like to confirm with you.

Next 2 core team calls: **December 8 and 22** from 9:30-11 MST.

If we keep with the bi-weekly schedule, the third one would be **January 5**, but the time conflicts with the next FWS coord call ...

Next FWS coord call: **January 5**, 10-11 MST

Next State coord call (after tomorrow): **December 30**, 1-2:30 MST -- this date could be problematic; should we schedule for **January 6** instead?

I'll post after hearing back from you.

Cheers,  
Mary

--

*Mary Parkin*  
*Endangered Species Recovery Coordinator, Northeast Region*  
*U.S. Fish and Wildlife Service, Hadley, MA*  
*Remotely located in Escalante, Utah:*  
*Mailing address PO Box 637, Escalante, UT 84726*  
*Street address 145 North Center St, Escalante, UT 84726*  
*Phone 617-417-3331*  
*Email [mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)*

--

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*Mary Parkin*  
*Endangered Species Recovery Coordinator, Northeast Region*  
*U.S. Fish and Wildlife Service, Hadley, MA*  
*Remotely located in Escalante, Utah:*  
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*Email [mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)*

--

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Ron Moen](#)  
**Subject:** Re: Lynx Expert Workshop Materials  
**Date:** Monday, December 07, 2015 1:17:04 PM

---

Thanks Ron.

On Mon, Dec 7, 2015 at 11:09 AM, Ron Moen <[rmoen@d.umn.edu](mailto:rmoen@d.umn.edu)> wrote:

Hi Jim,

I'll try to get through it this week--is that soon enough?

Ron

On 7 Dec 2015 at 10:33, Zelenak, Jim wrote:

Date sent: Mon, 7 Dec 2015 10:33:32 -0700  
Subject: Lynx Expert Workshop Materials  
From: "Zelenak, Jim" <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>  
To: "McKelvey, Kevin -FS" <[kmckelvey@fs.fed.us](mailto:kmckelvey@fs.fed.us)>, Erin Simons-Legaard <[erin.simons@maine.edu](mailto:erin.simons@maine.edu)>, "Vashon, Jennifer" <[jennifer.vashon@maine.gov](mailto:jennifer.vashon@maine.gov)>, Ron Moen <[rmoen@d.umn.edu](mailto:rmoen@d.umn.edu)>, "Catton, Susan J -FS" <[scatton@fs.fed.us](mailto:scatton@fs.fed.us)>, "Squires, John -FS" <[jsquires@fs.fed.us](mailto:jsquires@fs.fed.us)>, Jay Kolbe <[jkolbe.fwp@gmail.com](mailto:jkolbe.fwp@gmail.com)>, "Maletzke, Benjamin T (DFW)" <[Benjamin.Maletzke@dfw.wa.gov](mailto:Benjamin.Maletzke@dfw.wa.gov)>, Jake Ivan - DNR <[Jake.ivan@state.co.us](mailto:Jake.ivan@state.co.us)>, "Bowman, Jeff (MNRF)" <[jeff.bowman@ontario.ca](mailto:jeff.bowman@ontario.ca)>, "Jackson, Scott -FS" <[sjackson03@fs.fed.us](mailto:sjackson03@fs.fed.us)>, "Schwartz, Michael K -FS" <[michaelkschwartz@fs.fed.us](mailto:michaelkschwartz@fs.fed.us)>, "Hodges, Karen" <[karen.hodges@ubc.ca](mailto:karen.hodges@ubc.ca)>, "Josh Lawler" <[jlawler@uw.edu](mailto:jlawler@uw.edu)>, "Wilsey, Chad" <[cwilsey@audubon.org](mailto:cwilsey@audubon.org)>, <[frel001@umn.edu](mailto:frel001@umn.edu)>, Alexej Siren <[asiren@umass.edu](mailto:asiren@umass.edu)>, "Baker, Richard (DNR)" <[richard.baker@state.mn.us](mailto:richard.baker@state.mn.us)>, Nichole Bjornlie <[nichole.bjornlie@wyo.gov](mailto:nichole.bjornlie@wyo.gov)>, "Roberts, Nathan M - DNR" <[NathanM.Roberts@wisconsin.gov](mailto:NathanM.Roberts@wisconsin.gov)>  
Copies to: Mark McCollough <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>, Tamara Smith <[tamara\\_smith@fws.gov](mailto:tamara_smith@fws.gov)>, Bryon Holt <[bryon\\_holt@fws.gov](mailto:bryon_holt@fws.gov)>, Kurt Broderdorp <[kurt\\_broderdorp@fws.gov](mailto:kurt_broderdorp@fws.gov)>, Heather Bell <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)>, "Jonathan Cummings" <[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)>, Mary Parkin <[mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)>, Jodi Bush <[jodi\\_bush@fws.gov](mailto:jodi_bush@fws.gov)>, Seth Willey <[seth\\_willey@fws.gov](mailto:seth_willey@fws.gov)>

> Hi All:

>

> Jennifer brought to my attention that her presentation as I forwarded  
> in the zip files to all workshop participants was truncated, missing  
> the last 8 or 9 slides. Presenters - please let me know if you have  
> found similar issues with presentations or any of the other materials.

>  
> Also, workshop participants - please let me know if you do or do not  
> intend to provide feedback on the workshop notes.

>  
> Thanks,  
> Jim

>  
> --

> Jim Zelenak, Biologist  
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>

--  
Ron Moen 218-788-2610 or 218-726-7774  
Natural Resources Research Institute  
Biology Department, Swenson College of Science and Engineering  
University of Minnesota Duluth

[www.d.umn.edu/~rmoen](http://www.d.umn.edu/~rmoen), [www.nrri.umn.edu/lynx](http://www.nrri.umn.edu/lynx), [www.nrri.umn.edu/moose](http://www.nrri.umn.edu/moose)

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**From:** [Zelenak, Jim](mailto:Zelenak, Jim)  
**To:** [Nichole Bjornlie](mailto:Nichole Bjornlie)  
**Subject:** Re: Lynx Expert Workshop Materials  
**Date:** Monday, December 07, 2015 1:27:53 PM

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Yeah - I got a bunch of "undeliverable" kick-back messages from your server. But I can try again. I'll try to send the relevant zip folders one at a time after this message.

On Mon, Dec 7, 2015 at 1:21 PM, Nichole Bjornlie <[nichole.bjornlie@wyo.gov](mailto:nichole.bjornlie@wyo.gov)> wrote:

Hi Jim,

I have the list of attendees and workshop notes and your and Ben Maletzke's presentations. Those were the only ones I received. Sorry about the confusion; it seems my e-mail may not be working as well as I thought with the name change.

Thanks again,  
Nichole

On Mon, Dec 7, 2015 at 1:18 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Hi Nichole,

I emailed several zip files each with several of the workshop presentations as PDFs - do you know which ones you're missing?

On Mon, Dec 7, 2015 at 11:12 AM, Nichole Bjornlie <[nichole.bjornlie@wyo.gov](mailto:nichole.bjornlie@wyo.gov)> wrote:

Hi Jim,

I didn't have anything to add to the workshop notes. I compared them with what I had jotted down during the meeting, and didn't see anything missing. Also, would you mind passing on that zip file again? I'm not sure I received it in the first round.

Thanks,  
Nichole

On Mon, Dec 7, 2015 at 10:33 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Hi All:

Jennifer brought to my attention that her presentation as I forwarded in the zip files to all workshop participants was truncated, missing the last 8 or 9 slides. Presenters - please let me know if you have found similar issues with presentations or any of the other materials.

Also, workshop participants - please let me know if you do or do not intend to provide feedback on the workshop notes.

Thanks,  
Jim

--

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Wyoming Game and Fish Department  
260 Buena Vista Drive  
Lander, WY 82520  
Phone: [307.332.7723 ext. 230](tel:307.332.7723)  
Fax: [307.332.6669](tel:307.332.6669)  
[nichole.bjornlie@wyo.gov](mailto:nichole.bjornlie@wyo.gov)

\*Please note change in e-mail address

E-Mail to and from me, in connection with the transaction of public business, is subject to the Wyoming Public Records Act and may be disclosed to third parties.

--

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Thanks,  
Jim

--  
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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Vashon, Jennifer](#)  
**Subject:** Re: Canada Lynx Expert Elicitation Workshop Notes  
**Date:** Monday, December 07, 2015 2:47:34 PM

---

The only slide I see like that was number 16 in her presentation, first slide on page 6 of the PDF, showing proposed and expanded study areas, budworm DSS implementation, and extent of northern forest.

I think the PPT that I have is the one she gave at the workshop...

On Mon, Dec 7, 2015 at 2:38 PM, Vashon, Jennifer <[Jennifer.Vashon@maine.gov](mailto:Jennifer.Vashon@maine.gov)> wrote:

I thought she included a slide for the expanded study area (all of northern Maine) that showed an increase in the amount of habitat in 2050. I even recall talking about that during the persistence graph exercise, but couldn't find it. Perhaps I'm mistaken.

Is there flexibility in getting our comments in or do you still need them today? I'm still working on my review.

Thanks

Jen

**From:** Zelenak, Jim [mailto:[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)]  
**Sent:** Monday, December 07, 2015 4:28 PM  
**To:** Vashon, Jennifer  
**Subject:** Re: Canada Lynx Expert Elicitation Workshop Notes

No word from others regarding presentation completeness. Some are still working on reviewing the notes and others have said they did so and have no comments/additions/edits.

My zip file version of Erin's presentation has all of her slides from the powerpoint except the very last one, which was just the title slide repeated.

52 slides in her presentation; 51 (17 pages with 3 per page) in the zipped PDF. Also - the duplicate slides (pg. 10) were in the presentation, too - one appeared to be animated but not the other, so maybe left in by mistake? Let me know if your PDF seems different and I will try to figure another way to send it.

On Mon, Dec 7, 2015 at 2:02 PM, Vashon, Jennifer <[Jennifer.Vashon@maine.gov](mailto:Jennifer.Vashon@maine.gov)> wrote:

Hi Jim,

I've been working on my review of the meeting notes, I've been relying heavily on my notes, the presentation pdfs and your notes. It appears that other presentations may not be complete. I recalled a couple slides from Erin's that I couldn't find—I recalled her presenting a habitat slide from her updated model. I noticed that one slide was in twice (see slide 2 and 3 on page 10), so perhaps that was where the other one was supposed to be.

Have you heard back from others, that their presentations weren't complete?

**From:** Zelenak, Jim [mailto:[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)]  
**Sent:** Friday, December 04, 2015 4:23 PM  
**To:** Vashon, Jennifer  
**Cc:** Mary Parkin  
**Subject:** Re: Canada Lynx Expert Elicitation Workshop Notes

Thanks, Jen.

It looks like we lost the last 11 slides from your presentation when we converted to a zip file. I'm not sure how/why that happened, but in our record/files, we have your full presentation (34 slides, with the last one showing long-distance movements).

I'll notify other presenters and ask them to let us know if there are problems with other presentations and/or if they'd like us to send a full copy of yours.

Thanks for catching that.

You have a good weekend, too!

Jim

On Fri, Dec 4, 2015 at 1:56 PM, Vashon, Jennifer <[Jennifer.Vashon@maine.gov](mailto:Jennifer.Vashon@maine.gov)> wrote:

Jim,

I started my review of the materials. I noticed that you did not have all the slides from my presentation in the zip file you attached here. So wanted to point that out to you.

I'll do my best to get my comments in by Monday EOB.

Have a great weekend,

Jen

**From:** Zelenak, Jim [mailto:[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)]

**Sent:** Tuesday, November 24, 2015 5:30 PM

**To:** McKelvey, Kevin -FS; Erin Simons-Legaard; Vashon, Jennifer; Ron Moen; Catton, Susan J -FS; Squires, John -FS; Jay Kolbe; Maletzke, Benjamin T (DFW); Jake Ivan - DNR; Bowman, Jeff (MNRF); Jackson, Scott -FS; Schwartz, Michael K -FS; Hodges, Karen; Josh Lawler; Wilsey, Chad; [freli001@umn.edu](mailto:freli001@umn.edu); Alexej Siren; Baker, Richard (DNR); Nichole Bjornlie; Roberts, Nathan M - DNR

**Cc:** Jodi Bush; Kurt Broderdorp; Bryon Holt; Mark McCollough; Tamara Smith; Mary Parkin; Heather Bell; Jonathan Cummings; Seth Willey; Justin Shoemaker

**Subject:** Re: Canada Lynx Expert Elicitation Workshop Notes

Two more zip files of presentations from the workshop are attached

On Tue, Nov 24, 2015 at 1:22 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

All:

Attached please find the notes taken during the workshop. They have been reviewed (and in some cases amended with notes taken separately) by the SSA Core Team members. Please review these notes, make any necessary corrections and/or clarifications using "Track Changes," add any additional thoughts or considerations (on the science or workshop proceedings, not on policy/listing considerations) in the space provided at the end of this document, and return via email to [jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov) by Monday, Dec. 7, 2015.

Presentations and handouts referenced in these notes will be sent via separate emails.

We will prepare and disseminate to workshop participants a Workshop Report summarizing the proceedings and providing the Service's analysis and assessment of the information gathered at the workshop. That report will also include these notes and corrections/clarifications provided by participants.

We may also follow-up with lynx experts individually or as a group with additional questions generated by the workshop.

Let me know if you have questions.

--

Jim Zelenak, Biologist

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Alexej Siren](#)  
**To:** "[Zelenak, Jim](#)"  
**Subject:** RE: Lynx Expert Workshop Materials  
**Date:** Monday, December 07, 2015 5:13:35 PM

---

Hello Jim,

Sorry I am responding late to your emails from the past couple weeks. I do plan to provide feedback on the workshop notes. I have been dealing with a crazy end of the semester workload but should be out of the woods by the end of the week.

I hope you are well!

Alexej

Alexej Sirén, MSc.  
PhD Fellow  
DOI Northeast Climate Science Center  
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[asiren@umass.edu](mailto:asiren@umass.edu)

**From:** Zelenak, Jim [mailto:[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)]  
**Sent:** December 7, 2015 12:34 PM  
**To:** McKelvey, Kevin -FS <[kmckelvey@fs.fed.us](mailto:kmckelvey@fs.fed.us)>; Erin Simons-Legaard <[erin.simons@maine.edu](mailto:erin.simons@maine.edu)>; Vashon, Jennifer <[jennifer.vashon@maine.gov](mailto:jennifer.vashon@maine.gov)>; Ron Moen <[rmoen@d.umn.edu](mailto:rmoen@d.umn.edu)>; Catton, Susan J - FS <[scatton@fs.fed.us](mailto:scatton@fs.fed.us)>; Squires, John -FS <[jsquires@fs.fed.us](mailto:jsquires@fs.fed.us)>; Jay Kolbe <[jkolbe.fwp@gmail.com](mailto:jkolbe.fwp@gmail.com)>; Maletzke, Benjamin T (DFW) <[Benjamin.Maletzke@dfw.wa.gov](mailto:Benjamin.Maletzke@dfw.wa.gov)>; Jake Ivan - DNR <[jake.ivan@state.co.us](mailto:jake.ivan@state.co.us)>; Bowman, Jeff (MNRF) <[jeff.bowman@ontario.ca](mailto:jeff.bowman@ontario.ca)>; Jackson, Scott -FS <[sjackson03@fs.fed.us](mailto:sjackson03@fs.fed.us)>; Schwartz, Michael K -FS <[michaelkschwartz@fs.fed.us](mailto:michaelkschwartz@fs.fed.us)>; Hodges, Karen <[karen.hodges@ubc.ca](mailto:karen.hodges@ubc.ca)>; Josh Lawler <[jlawler@uw.edu](mailto:jlawler@uw.edu)>; Wilsey, Chad <[cwilsey@audubon.org](mailto:cwilsey@audubon.org)>; [freli001@umn.edu](mailto:freli001@umn.edu); Alexej Siren <[asiren@umass.edu](mailto:asiren@umass.edu)>; Baker, Richard (DNR) <[richard.baker@state.mn.us](mailto:richard.baker@state.mn.us)>; Nichole Bjornlie <[nichole.bjornlie@wyo.gov](mailto:nichole.bjornlie@wyo.gov)>; Roberts, Nathan M - DNR <[NathanM.Roberts@wisconsin.gov](mailto:NathanM.Roberts@wisconsin.gov)>  
**Cc:** Mark McCollough <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)>; Tamara Smith <[tamara\\_smith@fws.gov](mailto:tamara_smith@fws.gov)>; Bryon Holt <[bryon\\_holt@fws.gov](mailto:bryon_holt@fws.gov)>; Kurt Broderdorp <[kurt\\_broderdorp@fws.gov](mailto:kurt_broderdorp@fws.gov)>; Heather Bell <[heather\\_bell@fws.gov](mailto:heather_bell@fws.gov)>; Jonathan Cummings <[jwcummings@usgs.gov](mailto:jwcummings@usgs.gov)>; Mary Parkin <[mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)>; Jodi Bush <[jodi\\_bush@fws.gov](mailto:jodi_bush@fws.gov)>; Seth Willey <[seth\\_willey@fws.gov](mailto:seth_willey@fws.gov)>  
**Subject:** Lynx Expert Workshop Materials

Hi All:

Jennifer brought to my attention that her presentation as I forwarded in the zip files to all workshop participants was truncated, missing the last 8 or 9 slides. Presenters - please let me know if you have found similar issues with presentations or any of the other materials.

Also, workshop participants - please let me know if you do or do not intend to provide

feedback on the workshop notes.

Thanks,  
Jim

--

Jim Zelenak, Biologist  
U.S. Fish and Wildlife Service  
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(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [McCollough, Mark](#)  
**Subject:** Re: Squires lynx PVA  
**Date:** Tuesday, December 08, 2015 9:20:32 AM

---

I'll talk to John to see where he's at on that, if any progress has been made, though I haven't heard anything to that effect.

On Tue, Dec 8, 2015 at 9:09 AM, McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)> wrote:

Jim: As I was going through my lynx PVA files this morning I ran across this document. I believe it is summaries from the last lynx BioTeam meeting/workshop in northern MN a few years ago. It references John's intent to do lynx PVA work. Also, it references the lamdas that John presented at our lynx expert workshop recently. Did he complete the PVA???? If so, it may help us now.

Mark

--

Mark McCollough, Ph.D.  
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**From:** [Ivan - DNR, Jake](#)  
**To:** [Zelenak, Jim](#)  
**Subject:** Re: Lynx Expert Workshop Materials  
**Date:** Tuesday, December 08, 2015 3:14:26 PM

---

It would be easy for me to plot and tally ownership on a map of known and/or predicted lynx habitat. At that point, I don't know what to do about SRLA or BLM conservation agreements other than to assume these are in place for each acre of lynx habitat that falls within the corresponding ownership. That may or may not be a good assumption. If it isn't, then I'll need some help to figure out where these agreements/guidelines are in place and where their not.

Jake

Jake Ivan  
Wildlife Researcher  
Mammals Research Section



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[jake.ivan@state.co.us](mailto:jake.ivan@state.co.us) | [cpw.state.co.us](http://cpw.state.co.us)

On Tue, Dec 8, 2015 at 2:32 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Great. While I'm thinking about it, in addition to occupied vs maybe/likely vs. unoccupied, it would also be good to indicate conservation status on the map (e.g., areas covered by USFS S. Rockies Lynx Management Direction, BLM conservation agreement(s), State mgmt. guidelines or other conservation measures). Do you think that info is relatively quickly available?

On Tue, Dec 8, 2015 at 2:23 PM, Ivan - DNR, Jake <[jake.ivan@state.co.us](mailto:jake.ivan@state.co.us)> wrote:

Sounds good. Happy to help on the mapping front.

Jake

Jake Ivan  
Wildlife Researcher  
Mammals Research Section



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On Tue, Dec 8, 2015 at 2:22 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Thanks very much Jake!

I'll get back to you on the ownership question, and I'd like to talk to you at some point about how tough it would be to generate a map showing areas known to be occupied by resident lynx vs. areas where they are suspected to be or might be but where presence has not been confirmed by recent surveys. I think maps like that for all the geographic areas, based on the thoughts of folks most familiar with each population, would be helpful in the SSA report.

Jim

On Tue, Dec 8, 2015 at 9:30 AM, Ivan - DNR, Jake <[jake.ivan@state.co.us](mailto:jake.ivan@state.co.us)> wrote:

Hi Jim,

I didn't hear anything back from those I was waiting on, so here are my comments (very few) on the notes. Let me know if you have questions.

Jake

Jake Ivan  
Wildlife Researcher  
Mammals Research Section



P [970.472.4310](tel:970.472.4310) | F [970.472.4457](tel:970.472.4457) | C [970.556.8048](tel:970.556.8048)  
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On Mon, Dec 7, 2015 at 10:33 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Hi All:

Jennifer brought to my attention that her presentation as I forwarded in the zip files to all workshop participants was truncated, missing the last 8 or 9 slides. Presenters - please let me know if you have found similar issues with presentations or any of the other materials.

Also, workshop participants - please let me know if you do or do not intend to provide feedback on the workshop notes.

Thanks,  
Jim

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Vashon, Jennifer](#)  
**Subject:** Re: Canada Lynx Expert Elicitation Workshop Notes  
**Date:** Wednesday, December 09, 2015 9:45:05 AM

---

Thanks Jen!

On Tue, Dec 8, 2015 at 4:10 PM, Vashon, Jennifer <[Jennifer.Vashon@maine.gov](mailto:Jennifer.Vashon@maine.gov)> wrote:

My comments are attached, thanks for the opportunity to review and allowance of some additional time. I look forward to the final draft.

Have a good night!

Jen

---

**From:** Vashon, Jennifer  
**Sent:** Monday, December 07, 2015 5:04 PM  
**To:** 'Zelenak, Jim'  
**Subject:** RE: Canada Lynx Expert Elicitation Workshop Notes

I appreciate that Jim, I'll finish asap tomorrow.

Have a good evening and thanks for your timely response to my questions!

Jen

**From:** Zelenak, Jim [[mailto:jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)]  
**Sent:** Monday, December 07, 2015 4:49 PM  
**To:** Vashon, Jennifer  
**Subject:** Re: Canada Lynx Expert Elicitation Workshop Notes

Also - if you need some more time to finish your review, take it; but sooner is better, as always.



Thanks Jen!

Jim

On Mon, Dec 7, 2015 at 2:38 PM, Vashon, Jennifer <[Jennifer.Vashon@maine.gov](mailto:Jennifer.Vashon@maine.gov)> wrote:

I thought she included a slide for the expanded study area (all of northern Maine) that showed an increase in the amount of habitat in 2050. I even recall talking about that during the persistence graph exercise, but couldn't find it. Perhaps I'm mistaken.

Is there flexibility in getting our comments in or do you still need them today? I'm still working on my review.

Thanks

Jen

**From:** Zelenak, Jim [mailto:[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)]  
**Sent:** Monday, December 07, 2015 4:28 PM  
**To:** Vashon, Jennifer  
**Subject:** Re: Canada Lynx Expert Elicitation Workshop Notes

No word from others regarding presentation completeness. Some are still working on reviewing the notes and others have said they did so and have no comments/additions/edits.

My zip file version of Erin's presentation has all of her slides from the powerpoint except the very last one, which was just the title slide repeated.

52 slides in her presentation; 51 (17 pages with 3 per page) in the zipped PDF. Also - the duplicate slides (pg. 10) were in the presentation, too - one appeared to be animated but not the other, so maybe left in by mistake? Let me know if your PDF seems different and I will try to figure another way to send it.

On Mon, Dec 7, 2015 at 2:02 PM, Vashon, Jennifer <[Jennifer.Vashon@maine.gov](mailto:Jennifer.Vashon@maine.gov)> wrote:

Hi Jim,

I've been working on my review of the meeting notes, I've been relying heavily on my notes, the presentation pdfs and your notes. It appears that other presentations may not be complete. I recalled a couple slides from Erin's that I couldn't find—I recalled her presenting a habitat slide from her updated model. I noticed that one slide was in twice (see slide 2 and 3 on page 10), so perhaps that was where the other one was supposed to be.

Have you heard back from others, that their presentations weren't complete?

**From:** Zelenak, Jim [mailto:[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)]  
**Sent:** Friday, December 04, 2015 4:23 PM  
**To:** Vashon, Jennifer  
**Cc:** Mary Parkin  
**Subject:** Re: Canada Lynx Expert Elicitation Workshop Notes

Thanks, Jen.

It looks like we lost the last 11 slides from your presentation when we converted to a zip file. I'm not sure how/why that happened, but in our record/files, we have your full presentation (34 slides, with the last one showing long-distance movements).

I'll notify other presenters and ask them to let us know if there are problems with other presentations and/or if they'd like us to send a full copy of yours.

Thanks for catching that.

You have a good weekend, too!

Jim

On Fri, Dec 4, 2015 at 1:56 PM, Vashon, Jennifer <[Jennifer.Vashon@maine.gov](mailto:Jennifer.Vashon@maine.gov)> wrote:

Jim,

I started my review of the materials. I noticed that you did not have all the slides from my presentation in the zip file you attached here. So wanted to point that out to you.

I'll do my best to get my comments in by Monday EOB.

Have a great weekend,

Jen

**From:** Zelenak, Jim [mailto:[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)]

**Sent:** Tuesday, November 24, 2015 5:30 PM

**To:** McKelvey, Kevin -FS; Erin Simons-Legaard; Vashon, Jennifer; Ron Moen; Catton, Susan J -FS; Squires, John -FS; Jay Kolbe; Maletzke, Benjamin T (DFW); Jake Ivan - DNR; Bowman, Jeff (MNRF); Jackson, Scott -FS; Schwartz, Michael K -FS; Hodges, Karen; Josh Lawler; Wilsey, Chad; [freli001@umn.edu](mailto:freli001@umn.edu); Alexej Siren; Baker, Richard (DNR); Nichole Bjornlie; Roberts, Nathan M - DNR

**Cc:** Jodi Bush; Kurt Broderdorp; Bryon Holt; Mark McCollough; Tamara Smith; Mary Parkin; Heather Bell; Jonathan Cummings; Seth Willey; Justin Shoemaker

**Subject:** Re: Canada Lynx Expert Elicitation Workshop Notes

Two more zip files of presentations from the workshop are attached

On Tue, Nov 24, 2015 at 1:22 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

All:

Attached please find the notes taken during the workshop. They have been reviewed (and in some cases amended with notes taken separately) by the SSA Core Team members. Please review these notes, make any necessary corrections and/or clarifications using "Track Changes," add any additional thoughts or considerations (on the science or workshop proceedings, not on policy/listing considerations) in the space provided at the end of this document, and return via email to [jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov) by Monday, Dec. 7, 2015.

Presentations and handouts referenced in these notes will be sent via separate emails.

We will prepare and disseminate to workshop participants a Workshop Report summarizing the proceedings and providing the Service's analysis and assessment of the information gathered at the workshop. That report will also include these notes and corrections/clarifications provided by participants.

We may also follow-up with lynx experts individually or as a group with additional questions generated by the workshop.

Let me know if you have questions.

--

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Bush, Jodi](#)  
**To:** [Zelenak, Jim](#)  
**Subject:** Re: Workshop Note reviews  
**Date:** Wednesday, December 09, 2015 10:49:42 AM

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Do you have a timeline? You might remind them of it (when do we want them to have addressed the comments). Good job keeping on this. Report next.... :) JB

Jodi L. Bush  
Field Supervisor  
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(406) 449-5225, ext.205

On Wed, Dec 9, 2015 at 10:05 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Drive is telling me I already shared these, so I think that means you got notices, but I wanted to make sure. I selected the share function, which indicated, without me specifying any of you, that the folder had already been shared. Let me know if you were alerted to the creation of the "Participant Review..." folder under Workshop Materials -> Workshop Notes.

I uploaded the reviews I received yesterday from Jake Ivan, John Squires, and Jen Vashon. Will upload others as they come in. You should be able to see the edits and comments. I replied to one comment from Jen.

Core Team - please take a look especially at comments from reviewers from your part of the DPS. Thanks.

--

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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [Zelenak, Jim](#)  
**To:** [Ivan - DNR, Jake](#)  
**Subject:** Re: Canada Lynx Expert Elicitation Workshop Notes  
**Date:** Wednesday, December 09, 2015 11:47:53 AM

---

I was able to download the powerpoint from Google Drive, and I also grabbed the PDF from your other message.

Thanks a lot Jake.

Jim

On Wed, Dec 9, 2015 at 10:09 AM, Ivan - DNR, Jake <[jake.ivan@state.co.us](mailto:jake.ivan@state.co.us)> wrote:

And looks like the email below was too large for your server. I just sent you a link to Google Drive, so hopefully you can download the updated powerpoint from there. Let me know.

Jake

----- Forwarded message -----

**From:** Ivan - DNR, Jake <[jake.ivan@state.co.us](mailto:jake.ivan@state.co.us)>  
**Date:** Wed, Dec 9, 2015 at 10:04 AM  
**Subject:** Re: Canada Lynx Expert Elicitation Workshop Notes  
**To:** "Zelenak, Jim" <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>

Hi Jim,

I remembered yesterday after sending off comments on the notes that I didn't review my powerpoint. I didn't see any problems regarding missing slides as happened with Jen's presentation.

However, in my haste to put this together, I combined some slides from various powerpoints I already had on hand. I just noticed that while I updated most of the slide notes to reflect the new presentation, notes for 2 slides never got updated and didn't make as much sense as they should have (they made sense in the context of the original presentation they came from, but not so much for this presentation). Also, some of the slides could have used more notes to clarify the point I was trying to make with the graphic, so I added/alterd as necessary for 2-3 more slides.

Anyway, I attached a revised version of the Powerpoint here. All slides are exactly the same as what I presented in Minneapolis. The only changes I made was to update some of the notes to better reflect what I said and to better clarify the presentation for anyone trying to make sense of it without the benefit of hearing the talk. Let me know if you have questions.

Jake

Jake Ivan  
Wildlife Researcher  
Mammals Research Section





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On Tue, Nov 24, 2015 at 3:29 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:  
Two more zip files of presentations from the workshop are attached

On Tue, Nov 24, 2015 at 1:22 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:  
All:

Attached please find the notes taken during the workshop. They have been reviewed (and in some cases amended with notes taken separately) by the SSA Core Team members. Please review these notes, make any necessary corrections and/or clarifications using "Track Changes," add any additional thoughts or considerations (on the science or workshop proceedings, not on policy/listing considerations) in the space provided at the end of this document, and return via email to [jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov) by Monday, Dec. 7, 2015.

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## **INTRODUCTION**

### Background & Need

The State of Idaho contains some of the largest undeveloped and wild land in the lower 48 states, containing habitats as diverse as sagebrush steppe, montane spruce-fir forest, desert canyons, and alpine summits. It is home to wolves, grizzly bears, and wolverines, as well as lesser known wildlife, plant, and fish species that are found only in Idaho and nowhere else on Earth. Runs of salmon and steelhead still return to Idaho where they take advantage of the large and relatively intact ecosystems it has to offer. Idahoans are proud of their natural resources, and many people make the journey to this state to experience its unique natural wonders.

The majority of Idaho is publically owned and relatively undeveloped. There are roughly 1.6 million people living in the state with a rapidly growing population. Much of the altered landscape has been converted to agriculture which is a thriving economy in the state. Historically conservation has been challenged by multiple land use impacts and is confronted by a suite of new challenges such as energy development, invasive species, changing frequency and intensity of wildfire, and urban development. Additionally, climate change threatens to exacerbate many of these issues. Conservation efforts conducted by the Idaho Fish and Wildlife Office (IFWO) and its partners have seen important successes, but the changes in land use and other threats necessitate the need for a more strategic approach in how we plan and implement conservation.

### Landscape Approach

Recently the U.S. Fish and Wildlife Service (Service) has stressed the need to focus on landscape-scale efforts to better conserve sustainable biological communities in the face of existing and expanding threats. This larger approach will require the Service to identify priority landscapes and carry out meaningful conservation measures within them. This more focused effort will reduce our conservation efforts in areas outside of the selected landscapes, but with appropriate landscape selection and partnering, larger and longer lasting conservation gains will be obtained for the resources committed. Such a shift will require changes in the Service's and IFWO's approach in conservation design and delivery, with the intent to focus our work in areas with high conservation value.

This landscape approach will necessitate productive partnerships with wildlife and land managers from State, Federal, Tribal and local governments and agencies, as well as private landowners, NGOs and other stakeholders. The establishment of strong partnerships will allow us to pool resources, benefiting from the strengths of our collaboration to help ensure that mutually identified conservation goals and objectives will be achieved.

### Strategic Habitat Conservation Approach

The Service has emphasized the use of science-based information in its decision-making process and as a tool to measure conservation success. To this end, the IFWO will apply the Service's **Strategic Habitat Conservation (SHC)**<sup>1</sup> approach to implement a science-based, adaptive process to our conservation efforts. The SHC process will employ all of the IFWO's tools to conserve and protect healthy and sustainable ecological processes within selected landscapes. As implemented by the Service, SHC will also support a strong monitoring component that allows biologists and managers to measure success, detect shortcomings, and allow for modifications as the SHC process continues or new projects are planned and initiated to ensure the management efforts are resulting in the identified conservation goals.

A potentially effective tool currently being studied for its use in SHC is that of Surrogate Species. Surrogate species are those species that, by their qualities make them good proxies for landscape health, serving as indicators of the habitat and other species that rely on those habitats. Selection and monitoring of appropriate surrogates allows managers to gage the effectiveness of their management actions, but greatly reduces the number of variables to be monitored, reducing monitoring effort and costs. Good surrogates not only serve as indicators of the habitat(s) and biological community, but are also often used to educate and engage the public. Surrogate species are not specifically identified in this Strategy, but the priority species identified in this plan possess strong surrogate characteristics. The ultimate value and selection of surrogate species is addressed further in the Methods and Results section of this Strategy and will be a collaborative effort with willing partners.

In May of 2014, the IFWO completed a framework outlining a path to identify landscapes which would serve as focal area for our conservation efforts. This Strategy describes the outcome of the resulting process and positions the IFWO for the next steps of collaborating with partners and implementing selected conservation actions in selected priority landscapes. This Strategy is not final, but rather a living document that will be improved and finalized only with the participation of partnering agencies, organizations, Tribes, and individuals, all of whom will provide insights, plans, and resources to implement management actions that support mutually desired outcomes.

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<sup>1</sup> For more on this approach go to: <http://www.fws.gov/landscape-conservation/shc.html>

Changes in funding, organizational structure, and operations will be necessary for the IFWO to meet the challenges of the coming decades and provide long-lasting conservation benefits for landscapes. Implementing an SHC approach at landscape-scales will require new approaches to conservation planning, partnering, and implementation that will result in greater conservation benefits on the ground. Implementation of this Strategy will be an adaptive process and when executed successfully, provide large and long-lasting conservation benefits. Any landscape-scale strategy and its successful implementation will rely heavily on the willing participation of partnering agencies, landowners, Tribes, and NGOs with an active and engaging communication and education effort. Most importantly, a long-term landscape-scale SHC approach will require dedicated commitment and support from the Service at all levels, state, regional and national.

## **METHODS**

### IFWO All-Staff Engagement

Developing a state-wide IFWO landscape conservation strategy required engagement with all of the office's biological experts. To do this, the IFWO conducted three all-staff workshops held from July 2014 to September 2015. Topics addressed in each of these workshops included: 1) developed state-wide conservation goals and objectives; 2) identifying priority species; and 3) identifying priority landscapes. Development of these three planning components were based on the collective expertise of IFWO biologists, managers, and support staff from the three satellite offices located in Boise, Chubbuck, and Spokane. This staff-collaborative approach helped ensure that expertise from all programs of the IFWO Ecological Services would be represented, include local biological expertise from throughout the state, and that all staff members would develop some level of ownership in the process and outcomes of a final Strategy. Each of the workshops were supported by working groups made up of staff biologists and GIS experts that refined and standardized the Strategy components.

### Identifying Goals and Objectives

#### Habitat

#### Species

#### Inter-Landscape

### Selecting Priority Species

The initial list of potential priority species was provided by IFWO staff and included some \*\*\*\*\* species of plants and animals. This list included federally listed and candidate species, State of

Idaho Species of Greatest Conservation Need, U.S. Forest Service Sensitive and \*\*\*\*\* species, U.S. Bureau of Reclamation \*\*\*\*\* species,

The Service’s Landscape SHC approach emphasized the need to utilize species that serve as good habitat indicators and preferably with a substantial level of public appeal, serving as icons or “flagships” for the landscape or habitat under consideration. In an effort to narrow the list of potential priority species, IFWO staff ranked them on their qualities as habitat indicators and relative values as landscape icons. Other characteristics considered in these ranking exercises included: species’ value in a habitat keystone role, distribution and degree of endemism, and its various values as a metric for monitoring (e.g., existing information on status, ease of monitoring). This exercise along with \*\*\*\*

SWAP & partner alignment

### Selecting Priority Landscapes

Identification of potential priority landscapes was done by each of seven teams with expertise in each of seven Idaho ecoregions<sup>2</sup>. No specific constraints were placed on landscape design, but they typically were based on major drainage systems, the range of high profile species, major conservation initiatives, or active partnering efforts for those initiatives. The identification of potential priority landscapes was a task assigned to Ecoregion Teams, predominantly made up of staff biologists in each of the three IFWO offices, or those biologists with expertise on species or habitats from satellite IFWO offices. Landscape Team members utilized the developed Goals and Objectives as guidelines on which to base landscape design, but the characteristics used (e.g., connectivity, native composition, number of listed or potential priority species, ecosystem integrity, perceived resiliency) are subjective and typically lack quantitative data appropriate for decision-making. Hence, the delineation of landscape boundaries was subjective and left up to the Teams’ best professional judgment. Teams were directed to rank their landscapes based on their assessment of the above characteristics to ensure that those landscapes with the highest conservation value were considered by the final decision makers.

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<sup>2</sup> For more information on Ecoregion Teams, reference the 2014 Draft Idaho Strategic Framework.

## **RESULTS**

Results described here are regarded as working drafts and all can be modified based on continuing collaboration with our conservation partners. Hence, additional species (not identified here) may be considered as priorities or indicators as our strategies are merged with those of our partners in these landscapes.

### Priority Species

### Priority Landscapes

### **Landscape Strategies**

Each of the Landscape Teams identified two to four individual strategies designed to address a priority conservation need within their landscape. They are provided here in order of priority landscape (alphabetical) with the IFWO goals and objectives specifically stated to address those conservation needs. The strategies are laid out as a list of broad actions that address the most pertinent threats. Actions specific to each set of conservation objectives are listed numerically at the end of each Goal/Objective statement. Most or all of the identified actions can be further broken down to more achievable increments (e.g., sub-actions) but for the purposes of this document are general and brief. A more fine-grained accounting of actions and sub-actions will need to be maintained by landscape team members or management responsible for each strategy.

Each strategy includes a list of priority species that will specifically benefit from the listed actions some or all of which have been identified as having good qualities as habitat indicators, landscape icons, or possessing ecosystem keystone characteristics. These species, along with those prioritized by our partners can be considered as metrics to be used to quantify completion of the strategy objectives.

### **Blue Mountain Priority Landscape**

**Conservation Strategy 1: Secure and enhance native, resident salmonid populations and their habitats in the Blue Mountains Priority Landscape.**

**Priority Species: Bull Trout, West-slope Cutthroat Trout, Rocky Mountain Tailed Frog**

**Goal 1a: Ensure resilient, ecologically functioning aquatic habitats capable of supporting native species in the Blue Mountain Priority Landscape.** (Habitat blocks are large and diverse enough to support priority species and ancillary native species.)

Conservation Objectives

- i. Conserve remaining functional blocks of streams and rivers supporting aquatic priority species.
- ii. Identify and restore human-impacted aquatic habitats to ensure their use by aquatic priority species and that will promote connectivity within existing functional blocks of aquatic habitat within the landscape
- iii. Identify and address threats to aquatic habitats and their surrounding terrestrial and riparian habitats to ensure aquatic integrity.
- iv. Protect and restore all aquatic habitat types (lakes, rivers, streams) to ensure habitats for all life-history needs of aquatic priority species are available and connected.

Actions: 1, 2, 4, 5, 6, 8.

**Goal 1b: Ensure abundant, diverse, and resilient populations of aquatic priority species within the habitats of the Blue Mountain Priority Landscape.** (1: Populations of aquatic Priority Species are sustainable; 2: Biodiversity of native species is enhanced or maintained.)

Conservation Objectives

- i. Identify priority species as well as appropriate indicator and surrogate species as needed. Identify additional aquatic species that require special consideration as appropriate (e.g., federally listed species or other species identified by partners).
- ii. Protect or restore native habitats that support key life history components of priority species.
- iii. Identify and address threats to aquatic priority species and their habitat.
- iv. Promote connectivity between important habitat patches for aquatic priority species.
- v. Promote genetic diversity in the aquatic landscape.
- vi. Protect unique native species associated with aquatic habitats of the Blue Mountains Priority Landscape.

Actions: 2, 3, 5, 6, 7, 8.

**Goal 1c: Ensure that aquatic habitats within the Blue Mountains Priority Landscape are biologically connected to adjacent habitats outside of the landscape area.** (Priority landscapes are connected to adjacent protected areas or similar habitats in large enough blocks to maintain movement, genetic interchange, and habitat shifts for priority species.)

Conservation Objectives

- i. Identify existing and potential aquatic corridors to existing functional blocks of aquatic habitats in the Salmon and Snake River drainages, and similar drainages in Oregon, that will provide connectivity to aquatic Priority Species.



- ii. With partners, promote connectivity between important habitat patches adjacent to the Blue Mountains Priority Landscape.
- iii. With partners, plan restoration and/or mitigation efforts for aquatic habitats that connect adjacent Priority Landscapes or functional blocks of aquatic habitat.

Actions: 9.

### **Actions for Blue Mountains Conservation Strategy 1:**

Action 1: Using climate and resiliency models assess predicted habitat suitability for bull trout and other native, resident salmonids and focus on suitable areas for restoration Actions (Focal Drainages).

Action 2: Removal of passage barriers within Focal Drainages: a) Culvert replacement, b) fish ladder installation, c) fish screen installation, d) thermal barrier remediation (identified as Primary Threat in DRUIP: 2015 Draft Recovery Unit Implementation Plan);

Action 3: Control harmful non-native fish species within Focal Drainages (identified as Primary Threat in DRUIP);

Action 4: Restore or enhance anadromy, where appropriate, within Focal Drainages;

Action 5: Within Focal Drainages assess human water use in drainage and secure necessary in-stream flow sufficient for healthy trout populations and anadromy (identified as Primary Threat in DRUIP);

Action 6: Reduce human-caused sedimentation to streams in Focal Drainages;

Action 7: Assess non-native disease and/or parasite infection (cutthroat and redband) and address as feasible.

Action 8: Develop implementation and monitoring plan with partners.

Action 9: Consider habitat conditions adjacent to Blue Mountains Priority Landscape and work with partners to promote connectivity of aquatic habitats where appropriate.

### **Conservation Strategy 2: Secure and enhance canyon grasslands in the Salmon and Snake River corridors.**

**Priority Species: Bighorn Sheep, Macfarlane's Four-o'clock, Spalding's Silene, Willow Flycatcher, Golden Eagle, Mountain Quail, Palouse Goldenweed, Palouse Thistle**

**Goal 1a: Ensure resilient, ecologically functioning canyon grassland habitats capable of supporting native species in the Blue Mountain Priority Landscape.** (Habitat blocks are large and diverse enough to support Priority Species and ancillary native species.)

Conservation Objectives

- i. Conserve remaining functional blocks of canyon grasslands and the Priority Species within them.
- ii. Identify and restore impacted grassland habitats to ensure their use by Priority Species and promote connectivity to adjacent functional blocks of grassland habitat within the landscape.
- iii. Identify and address threats to canyon grassland habitats.
- iv. Protect and restore adjacent habitats to provide connected mosaic of native habitats.

Actions: 1, 2, 3, 4, 5, 6.

**Goal 1b: Ensure abundant, diverse, and resilient populations of native species within the targeted canyon grassland habitats.** (1: Populations of Priority Species are sustainable; 2: Biodiversity of native species is enhanced or maintained.)

Conservation Objectives

- i. Identify Priority Species as well as appropriate indicator and surrogate species as needed. Identify additional canyon grassland species that require special consideration as appropriate (e.g., federally listed species, SGCNs, or other species identified by partners).
- ii. Protect or restore native habitats that support key life history components of Priority Species.
- iii. Identify and address threats to canyon grassland-inhabiting Priority Species within targeted habitats.
- iv. Promote connectivity for Priority Species between important habitat patches of targeted canyon grasslands (Focal Grasslands; see Strategy below).
- v. Promote genetic diversity of Priority Species in the targeted canyon grassland habitats.
- vi. Protect unique native species (Priority, listed, SGCNs, etc.) associated with canyon habitats of the Blue Mountains Priority Landscape.

Actions: 1, 2, 3, 4, 5, 6.

**Goal 1c: Ensure that priority landscapes within and adjacent to Idaho are biologically connected.** (Priority landscapes are connected to adjacent protected areas or similar habitats in large enough blocks to maintain movement, genetic interchange, and habitat shifts for priority species.)

Conservation Objectives

- i. Identify existing and potential corridors between existing functional blocks of canyon grassland habitats within Blue Mountain Ecoregion (Idaho and Oregon).

- ii. With partners, promote connectivity between important habitat patches throughout the Blue Mountains Ecoregion and adjacent Ecoregions.
- iii. With partners, plan restoration and/or mitigation efforts for canyon grasslands and adjoining habitats that promote connectivity of Priority Species.

Actions: 1, 7.

### **Actions for Blue Mountains Conservation Strategy 2:**

Action 1: Using climate and resiliency models and land condition data, assess predicted habitat changes in the canyon grasslands biome within the Blue Mountains Priority Landscape. Identify resilient canyon grassland habitat patches (Focal Grasslands) with partner participation (IDFG, BLM, TNC).

Action 2: Develop integrated weed management plan with partners for identified invasive plants within Focal Grasslands (identified as Primary Threat in ESA plant recovery plans<sup>3</sup> and CMWMA).

Action 3: Effectively manage livestock grazing within Focal Grasslands (identified as recovery action in recovery plans<sup>2</sup> and CMWMA Mgmt. Plan).

Action 4: Restore or enhance native vegetation communities (and supporting components) for the benefit of co-occurring plants and native animal species within Focal Grasslands and adjacent habitats.

Action 5: Control use of pesticides (herbicides, insecticides, fungicides) in Focal Grasslands and adjacent habitats as appropriate.

Action 6: Develop implementation and monitoring plan with partners (IDFG, BLM, TNC, and NPT and private parties as appropriate).

Action 7: Consider canyon grassland habitat conditions adjacent to Blue Mountains Priority Landscape and work with partners to promote connectivity where appropriate.

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<sup>3</sup> Identified as primary threats in FWS recovery plans for Macfarlane's Four o'Clock (2000, revised) and *Silene spaldingii* (2007); CMWMA: IDFG Craig Mountain WMA Management Plan, 2014.

## **Middle Rockies Priority Landscape**

**Conservation Strategy 1: Stabilize and enhance populations of sage-steppe target priority species (Priority Species).**

**Priority Species: Greater Sage-grouse, pygmy rabbit**

**Goal 1a: Ensure resilient, ecologically functioning sagebrush-steppe habitats capable of supporting native species in the Middle Rockies Priority Landscape (Mid-Rockies PL).** (Habitat blocks are large and diverse enough to support Priority Species and other native species.)

### Conservation Objectives

- i. Conserve remaining functional blocks of sagebrush habitats to support priority species.
- ii. Identify and restore human-impacted habitats to ensure their use by Priority Species and that will promote connectivity within existing functional blocks of sage-steppe habitats within the landscape.
- iii. Identify and address threats to sage-steppe habitats and their surrounding habitats to ensure integrity.
- iv. Protect and restore all sage-steppe habitat types to ensure habitats for all life-history needs of Priority Species are available and connected.
- v. **Conserve 80% of sage-grouse Priority Habitat Management Areas** (PHMA) and Important Habitat Management Areas (IHMA).

Actions: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20.

**Goal 1b: Ensure abundant, diverse, and resilient populations of native species within their habitats.** (1: Populations of Priority Species are sustainable; 2: Biodiversity of native species [includes plant and animal species] is enhanced or maintained.)

### Conservation Objectives

- i. Use identified priority species (indicator, umbrella, surrogate, etc.) as needed to achieve strategic conservation. If needed, continue to identify species that require special consideration as appropriate (e.g., federally listed species or other species identified by partners).
- ii. Protect or restore native habitats that support key life history components of Priority Species.
- iii. Identify and address threats to Priority Species and their habitat.
- iv. Promote connectivity between important habitat patches for Priority Species.
- v. Promote genetic diversity of Priority Species in the sage-steppe landscape.
- vi. Protect unique native species associated with habitats of the Mid-Rockies PL.
- vii. With partners, create opportunities to implement populations monitoring.
- viii. With partners, evaluate priority species populations and habitat function to validate identified goals and objectives.
- ix. **Conserve 80% of sage-grouse populations** with the Mid-Rockies PL (based on counts of males on leks).

Actions: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20.

**Goal 3a: Ensure that sage-steppe habitats within and adjacent to the Mid-Rockies PL are biologically connected.** (Priority landscapes are connected (appropriate scale – compare with goal 1) to adjacent protected areas or similar habitats in large enough blocks to maintain movement, genetic interchange, and habitat shifts for Priority Species.)

Conservation Objectives

- i. Identify existing and potential corridors to existing functional blocks of sage-steppe habitats in Idaho, Montana and Wyoming that will provide connectivity to Priority Species.
- ii. With partners, plan restoration and/or mitigation efforts for sage-steppe habitats that connect adjacent Priority Landscapes or functional blocks of habitat to promote connectivity within and adjacent to the Mid-Rockies PL.

Actions: 13, 14.

**Actions for Middle Rockies Conservation Strategy 1:**

Action 1: Assist the BLM/FS with implementing land-use plans (LUPs) developed for sage-grouse conservation.

Action 2: Assist BLM/FS with implementing priority actions identified by Snake-Salmon-Beaverhead Fire & Invasives Assessment Team (FIAT).

Action 3: Assist BLM/FS with Burned Area Emergency Rehabilitation (BAER) and Emergency Stabilization and Rehabilitation (ES&R) efforts.

Action 4: Assist BLM with planning, funding, and implementation of Nesting Habitat Restoration.

Action 5: Assist the State of Idaho with implementing the Idaho Department of Lands Greater Sage-grouse Conservation Plan

Action 6: Provide funding and technical assistance to Sage-grouse Initiative Strategic Watershed Action Team biologists.

Action 7: Provide funding and assistance to establish Sage-grouse in the Schools programs.

Action 8: Assist INL with CCA implementation.

Action 9: Assist IDFG with lek counts.

Action 10: Assist NRCS and other partners with conservation strategy for the Pioneers area.

Action 11: Identify and address species-specific threats and habitat needs for Priority Species in the Mid-Rockies PL.

Action 12: Support research projects in the Mid-Rockies PL that will help refine management strategies for Priority Species in sage-steppe habitats.

Action 13: Identify existing and potential corridors for Priority Species in the Mid Rockies PL that are needed for conservation. Consider habitat conditions adjacent to Mid-Rockies PL and work with partners (in Idaho, Montana, and Wyoming) to promote connectivity (including migratory corridors) and to promote genetic diversity for Priority Species, where appropriate.

Action 14: Work with partners to develop implementation and monitoring plans for all actions.

Action 15: Using climate and resiliency models, assess predicted habitat suitability for pygmy rabbit, within the Mid-Rockies PL.

Action 16. Collaborate with BLM, NRCS, IDFG, IDL, and private landowners to focus habitat restoration in Focal Sagebrush Habitat that will provide for sustainable populations of sagebrush steppe obligate species as well as connectivity between Focal Sagebrush Habitat areas for pygmy rabbits.

Action 17: Encourage BLM, IDL, NRCS, and private landowners to employ a suite of tools to reduce invasive nonnative annual grasses (e.g., cheatgrass, medusahead) within and adjacent to pygmy rabbit suitable habitat within the Mid-Rockies PL Team.

Action 18: Encourage BLM, NRCS, IDFG, IDL, and private landowners to employ a suite of tools to increase species diversity within and adjacent to pygmy rabbit suitable habitat dominated by nonnative vegetation, including areas seeded post-fire with nonnative plants.

Action 19: Collaborate with BLM, NRCS, IDFG, and IDL to accelerate the re-establishment of shrub cover in areas with limited mid- to late-seral sagebrush within identified Focal Pygmy Rabbit Sagebrush Habitat in the Mid-Rockies PL.

Action 20: Encourage BLM, NRCS, IDFG, and IDL to maintain adequate shrub cover (>30%) in deep soil areas of Focal Sagebrush Habitat Areas to promote conservation of pygmy rabbit within the Mid-Rockies PL.

**Conservation Strategy 2: Secure and enhance wetlands (e.g., Lacustrine and Palustrine), excluding riparian and riverine habitats, in the Middle Rockies Priority Landscape.**

**Priority Species: Trumpeter Swan, White-faced Ibis, Greater Sage-grouse.**

**Goal 2a: Ensure resilient, ecologically functioning lacustrine and palustrine wetland ecosystems capable of supporting native species and habitat.** (Habitats are a mosaic in the priority landscape such that they support Priority Species and other native species across Idaho and adjacent landscapes.)

Conservation Objectives

- i. Identify priority wetlands within the landscape.
- ii. Work with partners to create opportunities for potential wetland improvement and construction of highest priority wetlands.
- iii. Work with partners on water conservation actions (incentives).
- iv. Reduce and/or prevent invasive species introduction into priority wetlands.
- v. Ensure objectives appropriate for individual wetlands are met.

Actions: 1, 2, 3, 4, 5.

**Goal 2b: Ensure abundant, diverse, and resilient populations of priority and native species within wetlands across the landscape.** (Populations of wetland-dependent Priority Species are sustainable.)

Conservation Objectives

- i. Identify Priority Species as well as appropriate indicator and surrogate species as needed. Identify additional terrestrial species that require special consideration as appropriate (e.g., federally listed species or other species identified by partners).
- ii. Identify and address threats to Priority Species and their habitat.
- iii. With partners, create opportunities to implement population monitoring.

Actions: 6, 7.

**Goal 2c: Ensure that wetlands within and adjacent to the Mid-Rockies PL are biologically connected.** (On a multi-landscape scale, populations of Priority Species are sustainable and biodiversity of native species is enhanced or maintained and not negatively impacted from this conservation strategy.)

Conservation Objectives

- i. Identify existing and potential wildlife corridors for Priority Species.
- ii. Promote connectivity between important wetlands.
- iii. Promote restoration efforts on wetlands adjacent to intact connected landscapes.
- iv. Coordinate with partners to ensure implementation of conservation objectives do not impede in adjacent landscape conservation.
- v. With partners, evaluate species populations, as needed, and habitat function to validate identified goals and objectives.

Actions: 8

**Actions for Middle Rockies Conservation Strategy 2:**

Action 1: Identify threats to wetland function and prioritize wetlands within the landscape.

Action 2: Work with partners to create opportunities for potential wetland improvement.

Action 3: Work with partners on water conservation actions (incentives).

Action 4: Reduce and prevent invasive species introduction and habitat conversions.

Action 5: Set measurable objectives appropriate for individual wetland types.

Action 6: Prioritize wetland-dependent priority species of the Service and partners.

Action 7: Work with partners to create opportunities for population monitoring.

Action 8: Identify existing and potential wetlands corridors for priority species between wetlands within and adjacent to the Mid-Rockies PL.



## Owyhee Uplands Priority Landscape

**Conservation Strategy 1 –Secure and enhance native, sagebrush steppe obligate species and their habitats in the Owyhee Uplands Priority Landscape.**

**Priority Species: Greater Sage-grouse, Pygmy Rabbit, Slickspot Peppergrass, Sage Sparrow, Sage Thrasher, Brewer’s Sparrow**

**Goal 1a: Ensure resilient, ecologically functioning sagebrush steppe ecosystems capable of supporting native species and habitats in the Owyhee Uplands Priority Landscape.** (Habitat blocks are large and diverse enough to support priority species and ancillary native species.)

### Conservation Objectives

- i. Conserve remaining functional blocks of sagebrush habitats supporting sagebrush priority species.
- ii. Identify and restore large enough blocks of functioning sagebrush habitat to support sagebrush priority species. Focus habitat restoration efforts to maintain or enhance resistance and resiliency of sagebrush habitats.
- iii. Identify and address threats to sagebrush habitats.
- iv. Promote connectivity between important sagebrush habitat patches.
- v. Protect mosaics of sagebrush habitat at multiple scales.

Actions: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15a, 15b, 16, 17, 18a, 18b, 19a, 19b, 20, 21a, 21b, 22, 23, 24, 25, 26, 27, 28a, 28b, 29, 30.

**Goal 1b: Ensure abundant, diverse, and resilient populations of sagebrush obligate species within their habitats in the Owyhee Uplands Priority Landscape.** (1: Populations of sagebrush priority species are sustainable; 2: Biodiversity of native species is enhanced or maintained.)

### Conservation Objectives

- i. Identify priority sagebrush species as well as appropriate indicator and surrogate species as needed. Identify additional sagebrush obligate species that require special consideration as appropriate (e.g., federally listed species or other species identified by partners.)
- ii. Protect or restore native sagebrush habitats that support key life history components of priority sagebrush species.
- iii. Identify and address threats to priority sagebrush species and their habitats.
- iv. Promote connectivity between important sagebrush habitat patches.
- v. Promote genetic diversity of priority sagebrush species.
- vi. Promote recovery of priority sagebrush species.
- vii. Protect mosaics of sagebrush habitat at multiple scales.
- viii. Protect unique sagebrush native species associated with the Owyhee Uplands Priority Landscape.

Actions: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15a, 15b, 16, 17, 18a, 18b, 19a, 19b, 20, 21a, 21b, 22, 23, 24, 25, 26, 27, 28a, 28b, 29, 30.

**Goal 1c: Ensure that sagebrush habitats within the Owyhee Uplands Priority Landscape are biologically connected to adjacent habitats outside of the landscape area.** (Priority landscapes are connected to adjacent protected areas or similar habitats in large enough blocks to maintain movement, genetic interchange, and habitat shifts for priority species.)

Conservation Objectives

- i. Identify existing and potential corridors to existing functional blocks of sagebrush habitats in the Owyhee Uplands Priority Landscape that will provide connectivity to sagebrush Priority Species.
- ii. With partners, promote connectivity between important habitat patches adjacent to the Owyhee Uplands Priority Landscape.
- iii. With partners, plan restoration and/or mitigation efforts for sagebrush habitats that connect adjacent Priority Landscapes or functional blocks of sagebrush habitat.

Actions: 13, 14, 31.

**Actions for Owyhee Uplands Conservation Strategy 1:**

Action 1: Assist the BLM with implementing land-use plans (LUPs) developed for sage-grouse conservation.

Action 2: Assist BLM with implementing priority actions identified by the Boise District and Twin Falls District Fire & Invasives Assessment Team (FIAT).

Action 3: Assist BLM with Burned Area Emergency Rehabilitation (BAER) and Emergency Stabilization and Rehabilitation (ES&R) efforts.

Action 4: Assist BLM with planning, funding, and implementation of Bruneau Owyhee Sage-Grouse Habitat (BOSH) Project.

Action 5: Assist BLM with planning, funding, and implementation of the Tri-State Fuels Breaks Project.

Action 6: Assist the State of Idaho with implementing the Idaho Department of Lands Greater Sage-grouse Conservation Plan

Action 7: Provide funding and technical assistance to Sage-grouse Initiative (SGI) Strategic Watershed Action Team biologists.

Action 8: Provide funding and assistance to establish Sage-grouse in the Schools programs.

Action 9: Assist IDFG with lek counts.

Action 10: Assist NRCS and other partners with conservation strategy for the Owyhee Uplands Priority Landscape.

Action 11: Identify and address species-specific threats and habitat needs for Priority Species in the Owyhee Uplands Priority Landscape.

Action 12: Support research projects in the Owyhee Uplands Priority Landscape that will help refine management strategies for Priority Species in sage-steppe habitats.

Action 13: Identify existing and potential corridors for Priority Species in the Owyhee Uplands PL that are needed for conservation

Action 14: Work with partners to develop implementation and effectiveness monitoring plans for all actions.

Action 15a: Using climate and resiliency models, assess predicted habitat suitability for pygmy rabbit, within the Owyhee Uplands Priority Landscape.

Action 15b: Using climate and resiliency models, assess predicted habitat suitability for slickspot peppergrass within the Owyhee Uplands Priority Landscape.

Action 16: Collaborate with BLM, NRCS, IDFG, IDL, Mountain Home Air Force Base, private landowners, and tribes to focus habitat restoration in Focal Sagebrush Habitat that will provide for sustainable populations of sagebrush steppe obligate species as well as connectivity between Focal Sagebrush Habitat areas for pygmy rabbit and slickspot peppergrass.

Action 17: Collaborate with partners to develop a recovery plan for slickspot peppergrass, including within the Owyhee Uplands Priority Landscape.

Action 18a: Encourage BLM, IDL, NRCS, and private landowners to employ a suite of tools to reduce invasive nonnative annual grasses (e.g., cheatgrass, medusahead) within and adjacent to pygmy rabbit suitable habitat within the Owyhee Uplands Priority Landscape.

Action 18b: Encourage BLM, IDL, MHAFB, and BLM livestock permittees to employ a suite of tools to reduce invasive nonnative annual grasses (e.g., cheatgrass) within and adjacent to slickspot peppergrass Occupied Habitat within the Owyhee Uplands Priority Landscape.

Action 19a: Encourage BLM, NRCS, IDFG, IDL, private landowners, and tribes to employ a suite of tools to increase species diversity within and adjacent to pygmy rabbit suitable habitat dominated by nonnative vegetation, including areas seeded post-fire with nonnative plants.

Action 19b: Encourage BLM, IDL, MHAFB, and BLM livestock permittees to employ a suite of tools to increase species diversity within and adjacent to slickspot peppergrass Occupied

Habitat dominated by nonnative vegetation, including areas seeded post-fire with nonnative plants.

Action 20: Fund pilot projects that will identify new techniques for maintaining or reestablishing resilience and resistance of sagebrush habitats, with an emphasis on native shrubs, grasses, and forbs.

Action 21a: Collaborate with BLM, NRCS, IDFG, IDL, Mountain Home Air Force Base, and tribes to accelerate the reestablishment of shrub cover in areas with limited mid- to late-seral sagebrush within identified Focal Pygmy Rabbit Sagebrush Habitat in the Owyhee Uplands Priority Landscape.

Action 21b: Collaborate with BLM, NRCS, IDFG, IDL, Mountain Home Air Force Base, and tribes to accelerate the reestablishment of shrub cover in areas with limited mid- to late-seral sagebrush within identified Focal Slickspot Peppergrass Sagebrush Habitat in the Owyhee Uplands Priority Landscape.

Action 22: Actively engage in and encourage partner collaboration with tribes, Nevada Department of Wildlife, and Oregon Department of Fish and Wildlife to promote sagebrush habitat connectivity for pygmy rabbit across tribal and state boundaries, where appropriate.

Action 23: Encourage BLM, NRCS, IDFG, IDL, and tribes to maintain adequate shrub cover (>30 percent total shrub cover) in deep soil areas of Focal Sagebrush Habitat Areas to promote conservation of pygmy rabbit within the Owyhee Uplands Priority Landscape.

Action 24: In collaboration with the LEPA Technical Team, BLM, Mountain Home Air Force Base, IDL, BLM livestock permittees, and IDFG, identify priority EOs within the Owyhee Uplands Priority Landscape for slickspot peppergrass habitat restoration and population augmentation or reestablishment through the Recovery planning process.

Action 25: In collaboration with BLM, MHAFB, IDL, BLM livestock permittees, and IDFG, maintain or re-establish native grasses, forbs, and shrubs as well as biological soil crusts at identified priority EOs to benefit slickspot peppergrass and the insect pollinators on which it depends.

Action 26: In collaboration with BLM, MHAFB, IDL, BLM livestock permittees, and IDFG, avoid or minimize ground disturbance and the incidence of invasive nonnative plants within and adjacent to identified priority EOs to benefit slickspot peppergrass and the slickspot microsites on which it depends.

Action 27: In collaboration with BLM, MHAFB, IDL, and IDFG, identify appropriate locations for population augmentation or reintroduction as part of slickspot peppergrass recovery.

Action 28a: In collaboration with BLM, MHAFB, IDL, NRCS, tribes, and IDFG, develop implementation and monitoring plans for sagebrush habitat activities to ensure pygmy rabbit conservation objectives are being met.

Action 28b: In collaboration with BLM, MHAFB, IDL, and IDFG, continue to implement implementation and effectiveness monitoring to ensure slickspot peppergrass conservation objectives are being met. Develop and implement appropriate monitoring to determine success of population augmentation and reintroduction efforts, as needed.

Action 29: Collaborate with BLM, IDFG, IBO, Audubon to establish breeding bird survey route(s) within the Owyhee Uplands PL for long term monitoring of sagebrush obligate songbirds (Brewers Sparrow, Sage Sparrow and Sage thrasher) and sagebrush habitats.

Action 30: Collaborate with partners to incorporate sagebrush obligate songbird monitoring as early indicators to evaluate restoration effectiveness of habitat improvement projects within the Owyhee Uplands PL.

Action 31: Actively engage in and encourage partner collaboration with tribes, IDFG, Nevada Department of Wildlife, and Oregon Department of Fish and Wildlife to promote sagebrush habitat connectivity for pygmy rabbit across tribal and state boundaries, where appropriate.

**Conservation Strategy 2 - Secure and enhance American beaver, Columbia spotted frog, and interior redband trout populations and their habitats (lotic, lentic, and wet meadow) within the Jarbidge, Bruneau, and Owyhee watersheds of the Owyhee Uplands Priority Landscape.**

**Priority Species: American Beaver, Columbia Spotted Frog (Great Basin DPS), and Interior Redband Trout.**

**Goal 2a: Ensure resilient, ecologically functioning aquatic habitats capable of supporting native aquatic species in the Owyhee Uplands Priority Landscape.** (Habitat blocks are large and diverse enough to support priority species and ancillary native species.)

Conservation Objectives

- i. Conserve remaining functional lotic, lentic, and wetland aquatic habitats supporting aquatic priority species.
- ii. Identify and restore large enough blocks of functioning aquatic habitat to support aquatic priority species. Focus habitat restoration efforts to maintain or enhance resistance and resiliency of aquatic habitats.
- iii. Identify and address threats to aquatic habitats.
- iv. Promote connectivity between important aquatic habitat patches.
- v. Protect aquatic habitat at multiple scales.

Actions: 1, 2, 3, 4, 5, 6, 7, 8.

**Goal 2b: Ensure abundant, diverse, and resilient populations of native aquatic species within their habitats in the Owyhee Uplands Priority Landscape.** (1: Populations of aquatic priority species are sustainable; 2: Biodiversity of native species is enhanced or maintained.)

### Conservation Objectives

- i. Identify priority aquatic species as well as appropriate indicator and surrogate species as needed. Identify additional aquatic species that require special consideration as appropriate (e.g., federally listed species or other species identified by partners.)
- ii. Protect or restore aquatic habitats that support key life history components of priority aquatic species.
- iii. Identify and address threats to priority aquatic species and their habitats.
- iv. Promote connectivity between important aquatic habitat patches.
- v. Promote genetic diversity of priority aquatic species.
- vi. Promote recovery of priority aquatic species.
- vii. Protect mosaics of aquatic habitat at multiple scales.
- viii. Protect unique aquatic native species associated with the Owyhee Uplands Priority Landscape.

Actions: 1, 2, 3, 4, 5, 6, 7, 8.

**Goal 2c: Ensure that aquatic habitats within the Owyhee Uplands Priority Landscape are biologically connected to adjacent habitats outside of the landscape area.** (Priority landscapes are connected to adjacent protected areas or similar habitats in large enough blocks to maintain movement, genetic interchange, and habitat shifts for priority species.)

### Conservation Objectives

- i. Identify existing and potential corridors to existing functional reaches of aquatic habitats in the Owyhee Uplands Priority Landscape that will provide connectivity to aquatic Priority Species.
- ii. With partners, promote connectivity between important habitat patches adjacent to the Owyhee Uplands Priority Landscape.
- iii. With partners, plan restoration and/or mitigation efforts for aquatic habitats that connect adjacent Priority Landscapes or functional reaches of aquatic habitat.

Actions: 8, 9.

### **Actions for Owyhee Uplands Conservation Strategy 2:**

Action 1. Use climate and resiliency models and GIS mapping to identify the configuration of predicted moderate to high quality future habitat for Columbia spotted frog, interior redband trout, and beaver in the Jarbidge, Bruneau, and Owyhee watersheds. Identify these areas as Focal Drainages and Focal Ponds/Wetlands.

Action 2. Collaborate with The Nature Conservancy (TNC), Trout Unlimited (TU), BLM, Ducks Unlimited (DU), IDL, and IDFG to restore or enhance beaver populations and their habitat, where appropriate.

Action 3. Collaborate with BLM, TU, and IDFG to remove stream passage barriers to benefit redband trout within Focal Drainages. Projects to remediate current stream passage barriers may include culvert replacement, fish ladder installation, fish screen installation, and thermal barrier remediation.

Action 4. Collaborate with IDFG to evaluate the presence of invasive nonnative species and remove/control invasive nonnative fish (primarily small-mouth bass) and bullfrogs, as needed, focusing on Focal Drainages and Focal Ponds/Wetlands.

Action 5. Collaborate with BLM, IDA, NRCS, APHIS, and TU and provide funding to reduce sedimentation and pesticide contamination of streams and wetlands in Focal Drainages.

Action 6. Collaborate with USGS, DU, and IDFG to fund assessments of nonnative disease and/or parasite infection (interior redband trout; Columbia spotted frog) and to treat as needed and feasible.

Action 7. Collaborate with NRCS, TU, DU, private landowners, and IDFG to encourage the use of flood irrigation within historic floodplains (rather than pivot irrigation) for conservation of wetland habitats.

Action 8. Collaborate with BLM, NRCS, USGS, TU, and IDFG to develop implementation and monitoring plans for aquatic habitat activities.

Action 9. Actively engage in and encourage partner collaboration to promote aquatic habitat connectivity across tribal and state boundaries, where appropriate.

**Conservation Strategy 3 - Aspen Habitats: Secure and enhance aspen habitats in the Owyhee Uplands Priority Landscape and the species that depend upon them.**

**Aspen Habitats Priority Species: Aspen, Beaver, Mule Deer**

**Goal 3a: Ensure resilient, ecologically functioning aspen habitats capable of supporting native species and habitats in the Owyhee Uplands Priority Landscape.** (Habitat blocks are large and diverse enough to support priority species and ancillary native species.)

Conservation Objectives

- i. Conserve remaining functional blocks of aspen habitats supporting aspen priority species.

- ii. Identify and restore large enough blocks of functioning aspen habitat to support aspen priority species. Focus habitat restoration efforts to maintain or enhance resistance and resiliency of aspen habitats.
- iii. Identify and address threats to aspen habitats.
- iv. Promote connectivity between important aspen habitat patches.
- v. Protect aspen habitat at multiple scales.

Actions: 1, 2, 3, 4, 5, 6, 7, 8.

**Goal 3b: Ensure abundant, diverse, and resilient populations of aspen and species that depend on this habitat in the Owyhee Uplands Priority Landscape.** (1: Populations of aspen and species that depend on it are sustainable; 2: Biodiversity of native species is enhanced or maintained.)

Conservation Objectives

- i. Identify priority aspen species as well as appropriate indicator and surrogate species as needed. Identify additional species dependent on aspen that require special consideration as appropriate (e.g., federally listed species or other species identified by partners.)
- ii. Protect or restore native aspen habitats that support key life history components of priority aspen species.
- iii. Identify and address threats to priority aspen species and their habitats.
- iv. Promote connectivity between important aspen habitat patches.
- v. Promote genetic diversity of priority aspen species.
- vi. Promote recovery of priority aspen species.
- vii. Protect mosaics of aspen habitat at multiple scales.
- viii. Protect unique native species dependent on aspen that are associated with the Owyhee Uplands Priority Landscape.

Actions: 1, 2, 3, 4, 5, 6, 7, 8.

**Goal 3c: Ensure that aspen habitats within the Owyhee Uplands Priority Landscape are biologically connected to adjacent habitats outside of the landscape area.** (Priority landscapes are connected to adjacent protected areas or similar habitats in large enough blocks to maintain movement, genetic interchange, and habitat shifts for priority species.)

Conservation Objectives

- i. Identify existing and potential corridors to existing functional blocks of aspen habitats in the Owyhee Uplands Priority Landscape that will provide connectivity to aspen Priority Species.
- ii. With partners, promote connectivity between important habitat patches adjacent to the Owyhee Uplands Priority Landscape.
- iii. With partners, plan restoration and/or mitigation efforts for aspen habitats that connect adjacent Priority Landscapes or functional blocks of aspen habitat.



Actions: 7, 9.

### **Actions for Owyhee Uplands Conservation Strategy 3:**

Action 1. Meet with IDFG and other partners to determine their willingness to collaboratively develop an aspen conservation strategy for the Owyhee Uplands Priority Landscape.

Action 2. Using climate and resiliency models and land condition data, assess predicted habitat changes in the aspen habitats within the Owyhee Uplands Priority Landscape. Identify resilient aspen habitat patches (Focal Aspen Sites) with TNC, IDFG, NRCS, USGS, and BLM. Prioritize predicted moderate to high quality future habitat (Focal Aspen Areas) to focus future conservation / restoration actions in these Focal Aspen Habitat Areas.

Action 3. Collaborate with IDFG, BLM, NRCS, private landowners, USGS, tribes, Mule Deer Foundation, AND Audubon to maintain or enhance Focal Aspen Sites. Techniques could include silvicultural practices (coppice management), prescribed burning, or domestic and wild large ungulate management through fencing or herd control.

Action 4. Collaborate with IDFG, BLM, NRCS, private landowners, USGS, tribes, TNC, and TU to restore or enhance beaver populations, where appropriate.

Action 5. In collaboration with IDFG, BLM, NRCS, private landowners, USGS, tribes, TNC, TU, Mule Deer Foundation, Audubon, and the Idaho Conservation League, provide funding and input on a public education program on the conservation of aspen habitat and its value to Idaho's wildlife legacy.

Action 6: In collaboration with BLM, NRCS, private landowners, USGS, tribes, and IDFG, lead an effort to monitor aspen stand health over time, inclusive of the extent of current and future Sudden Aspen Decline (SAD), within and adjacent to the Owyhee Uplands landscape through techniques such as satellite photo analyses, aerial photo analyses, and stand condition verification field visits.

Action 7: In collaboration with BLM, NRCS, private landowners, USGS, tribes, and IDFG, develop implementation and effectiveness monitoring plans for projects designed to benefit aspen.

Action 8. Collaborate with IDFG, tribes, and the Mule Deer Foundation to enhance mule deer populations within aspen areas, where appropriate,

Action 9. Actively engage in and encourage partner collaboration between tribes, Nevada Department of Wildlife, Oregon Department of Fish and Wildlife, and the Humboldt Toiyabe

National Forest to promote aspen connectivity across tribal and state boundaries, where appropriate.

**Conservation Strategy 4 - Secure and enhance canyon habitats in the Owyhee Uplands Priority Landscape (Jarbidge, Bruneau, and Owyhee watersheds) and species that depend on them, including bighorn sheep.**

**Canyon Habitats Priority Species: Bighorn Sheep**

**Goal 4a: Ensure resilient, ecologically functioning canyon ecosystems capable of supporting native species and habitats in the Owyhee Uplands Priority Landscape.** (Habitat blocks are large and diverse enough to support priority species and ancillary native species.)

Conservation Objectives

- i. Conserve remaining functional blocks of canyon habitats supporting canyon priority species.
- ii. Identify and restore large enough blocks of functioning canyon habitat to support canyon priority species. Focus habitat restoration efforts to maintain or enhance resistance and resiliency of canyon habitats.
- iii. Identify and address threats to canyon habitats.
- iv. Promote connectivity between important canyon habitat patches.
- v. Protect mosaics of canyon habitat at multiple scales.

Actions: 1, 2, 3, 4.

**Goal 4b: Ensure abundant, diverse, and resilient populations of canyon obligate species within their habitats in the Owyhee Uplands Priority Landscape.** (1: Populations of canyon priority species are sustainable; 2: Biodiversity of native species is enhanced or maintained.)

Conservation Objectives

- i. Identify priority canyon species as well as appropriate indicator and surrogate species as needed. Identify additional canyon obligate species that require special consideration as appropriate (e.g., federally listed species or other species identified by partners.)
- ii. Protect or restore native canyon habitats that support key life history components of priority canyon species.
- iii. Identify and address threats to priority canyon species and their habitats.
- iv. Promote connectivity between important canyon habitat patches.
- v. Promote genetic diversity of priority canyon species.
- vi. Promote recovery of priority canyon species.
- vii. Protect mosaics of canyon habitat at multiple scales.
- viii. Protect unique canyon native species associated with the Owyhee Uplands Priority Landscape.

Actions 1, 2, 3, 4.

**Goal 4c: Ensure that canyon habitats within the Owyhee Uplands Priority Landscape are biologically connected to adjacent habitats outside of the landscape area.** (Priority landscapes are connected to adjacent protected areas or similar habitats in large enough reaches to maintain movement, genetic interchange, and habitat shifts for priority species.)

Conservation Objectives

- i. Identify existing and potential corridors to existing functional reaches of canyon habitats in the Owyhee Uplands Priority Landscape that will provide connectivity to canyon Priority Species.
- ii. With partners, promote connectivity between important habitat patches adjacent to the Owyhee Uplands Priority Landscape.
- iii. With partners, plan restoration and/or mitigation efforts for canyon habitats that connect adjacent Priority Landscapes or functional reaches of canyon habitat.

Actions: 3, 4.

**Actions for Owyhee Uplands Conservation Strategy 4:**

Action 1: Using climate and resiliency models and land condition data, identify predicted moderate to high quality future habitat for bighorn sheep in the Jarbidge, Bruneau, and Owyhee Canyons. Identify resilient canyon habitat patches (Focal Canyonlands) important for bighorn sheep.

Action 2: Collaborate with IDFG, BLM, IDL, Bighorn Sheep Society (BHSS), and BLM livestock permittees to effectively manage livestock grazing within Focal Canyonlands to avoid transmission of diseases between domestic sheep and bighorn sheep.

Action 3: In collaboration with BLM, NRCS, private landowners, USGS, tribes, and IDFG, develop implementation and effectiveness monitoring plans for projects designed to benefit canyon habitats.

Action 4: Actively engage in and encourage partner collaboration with tribes, IDFG, Nevada Department of Wildlife, Oregon Department of Fish and Wildlife, and the Humboldt Toiyabe National Forest to promote connectivity for bighorn sheep across tribal and state boundaries, where appropriate.

## **Selkirk Cabinet-Yaak Priority Landscape**

### **Conservation Strategy 1: Enhance native salmonid populations within the Priest and Pend Oreille Basin.**

#### **Priority Species: Bull Trout, Westslope Cutthroat Trout**

#### **Goal 1a: Ensure resilient, ecologically functioning ecosystems capable of supporting native aquatic species and habitats in the Priest and Pend Oreille Basins.**

##### Conservation Objectives

- i. Conserve remaining functional blocks of streams and rivers supporting aquatic priority species.
- ii. Identify and restore impacted aquatic habitats to ensure their use by aquatic priority species and will promote connectivity within existing functional blocks of aquatic habitat within the landscape
- iii. Identify and address threats to aquatic habitats and their surrounding terrestrial and riparian habitats to ensure aquatic integrity.
- iv. Protect and restore all aquatic habitat types (lakes, rivers, streams, and associated wetland and riparian areas) to ensure habitats for all life-history needs of aquatic priority species are available and connected.

Actions: 1, 2, 3, 4, 5.

#### **Goal 1b: Ensure abundant, diverse, and resilient populations of native aquatic species within the habitats of the Priest and Pend Oreille River basin**

##### Conservation Objectives

- i. Protect or restore native habitats that support key life history components of priority species.
- ii. Identify and address threats to aquatic priority species and their habitat.
- iii. Promote connectivity between important habitat patches for aquatic priority species
- iv. Promote genetic diversity in the aquatic landscape.
- v. Promote recovery of priority species.

Actions: 5, 6, 7.

#### **Goal 1c: Ensure that key aquatic systems within the Priest and Pend Oreille River systems are biologically connected to adjacent landscapes within and adjacent to Idaho.**

##### Conservation Objectives

- i. Identify existing and potential aquatic corridors to existing functional blocks of aquatic habitats in the Priest and Pend Oreille River systems that will provide connectivity to aquatic Priority Species.
- ii. With partners, promote connectivity between important habitat patches adjacent to the Selkirk Cabinet-Yaak Priority Landscape.

- iii. With partners, plan restoration and/or mitigation efforts for aquatic habitats that connect adjacent Priority Landscapes or functional blocks of aquatic habitat.

Actions: 3, 8.

### **Actions for Selkirk Cabinet-Yaak Conservation Strategy 1:**

Action 1: Protect, improve, and restore key riparian and wetland habitats and their ecological function so that they support or contribute to sustainable population levels of focal species.

Action 2: Improve channel complexity within focal drainages.

Action 3: Restore fish passage at key dams.

Action 4: Restore and provide passage to migratory fish by removing potential man-caused barriers, i.e. impassable culverts, hydraulic headcuts, water diversion blockages, landslides, and impassable deltas.

Action 5: Reduce the threat from aquatic invasives by continuing financial support at boat check stations and staff participation in supporting the 100<sup>th</sup> Meridian Initiative and Idaho Invasive Species Council.

Action 6: Reduce threats from introduced fish species.

Action 7: Maintain or increase the total number of identified local populations of bull trout, and maintain the broad distribution of local populations across all existing core areas.

Action 8: Identify additional priority areas for connectivity between bull trout habitats across boundaries, whether using staff time, facilitating graduate research, or other methods.

### **Conservation Strategy 2: Enhance the viability of Selkirk Mountains ecosystem for the continuing benefit of terrestrial focal species.**

#### **Priority Species: Caribou, Lynx, Grizzly Bear**

#### **Goal 2a: Ensure resilient, ecologically functioning Selkirk Mountain ecosystems capable of supporting native terrestrial species and habitats.**

##### Conservation Objectives

- i. Conserve and enhance remaining functional habitat blocks or mosaics that support priority species.
- ii. Identify and address threats to habitats to ensure ecosystem integrity.
- iii. Identify and restore human-impacted habitats to ensure their use by priority species and will promote connectivity within existing functional blocks of habitats within the landscape.
- iv. Promote connectivity between important habitat patches to sustain all life history stages of native terrestrial species.
- v. Protect mosaics of habitat at multiple scales.

Actions: 1, 2, 3, 4, 5.

**Goal 2b: Ensure abundant, diverse, and resilient populations of native Selkirk Mountain species within their habitats.**

Conservation Objectives

- i. Protect or restore native habitats that support key life history components of priority species.
- ii. Identify and address threats to priority species and their habitats.
- iii. Promote connectivity between important habitat patches for priority species.
- iv. Promote genetic diversity in the Priority Landscape.
- v. Promote recovery of priority species.

Actions: 5, 6, 7.

Goal 2c: Ensure that priority landscapes within and adjacent to Idaho are biologically connected

Conservation Objectives

- i. Identify existing and potential wildlife corridors that will provide connectivity for Priority Species.
- ii. With partners, promote connectivity between important habitat patches adjacent to the Selkirk Cabinet-Yaak Priority Landscape.
- iii. With partners, plan restoration and/or mitigation efforts for habitats that connect adjacent Priority Landscapes or functional blocks of habitat.

Actions: 4, 8.

**Actions for Selkirk Cabinet-Yaak Conservation Strategy 2:**

Action 1: Improve function and complexity of mainstem riparian habitats to levels that support or contribute to sustainable population levels of priority species.

Action 2: Increase public education to reduce human-wildlife conflicts.

Action 3: Work with Forest Service to enhance habitats necessary to sustain viable population levels of priority species.

Action 4: Begin scoping efforts to provide a wildlife corridor between the Selkirk and Cabinet Mountains at McArthur Lake.

Action 5: Investigate current Lynx distribution and abundance within the Selkirk ecosystem. Information from these projects will be used in conjunction with other occurrence data to target areas for habitat enhancement or management projects.

Action 6: Reduce human-caused grizzly bear mortalities, particularly in the Wildlife Urban Interface.

Action 7: Update and expand population viability analysis (PVA) for trans-boundary mountain caribou in southern B.C.

Action 8: Perform landscape resistance analyses to identify potential wildlife corridors.

## CONCLUSION AND SUMMARY

**From:** Hopper, Dave  
**To:** [Dennis Mackey](#); [Michael Carrier](#); [Michael Morse](#); [Kathleen Hendricks](#)  
**Subject:** ROUGH DRAFT of the Landscape Conservation Strategy  
**Date:** Thursday, December 10, 2015 9:25:35 AM  
**Attachments:** [DraftIFWO-LandscapeStratPlan9Dec15.docx](#)

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At this point it is 28 pages long and attached.

As you can see, there is considerable work to be done. The 2014 Strategic Framework was used as a source where applicable, and modified to reflect the current document. Details of many of the processes we used in the current process have yet to be written (hence I could not cut and paste). Nonetheless, in its current state, it provides some idea of what our document will look like under its current design.

What different landscape teams refer to as "actions" could use some tightening up; many could be regarded as sub-actions or provide un-needed (?) details. However, this depends on how much detail we wish to present, and how much we wish to condense the document.

Also, since I have not had time to speak with any of the teams, some issues have yet to be resolved (e.g., Mid-Rockies: preserve 80% of Sage Grouse Core Area, etc., Owyhee bighorn sheep language), but that should come in the near term.

The mapping effort of each of the teams and for each of the landscapes or strategies is inconsistent and will also need work in the coming weeks.

--

Dave Hopper  
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Snake River Office  
1387 S. Vinnell Way  
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(208) 685-6957

"Ignorance more frequently begets confidence than does knowledge" Charles Darwin.



**From:** [Bush, Jodi](#)  
**To:** [Patricia Bergstrom](#)  
**Cc:** [Kaimy Marks](#); [Sharon Hooley](#)  
**Subject:** Fwd: trip to MLPS  
**Date:** Thursday, December 10, 2015 1:40:51 PM  
**Attachments:** [image004.png](#)  
[image001.png](#)  
[image002.png](#)  
[image003.png](#)

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Pat can you help us with this?

We have a few FS folks that we invited to come to our Lynx workshop in October in Minnesota. We said we would reimburse their travel expenses but for unknown reasons the agreement is still sitting in the CGS weeks after it got sent there.

I thought maybe you could help us figure it out as I really think this is not the way to treat fellow Federal agency folks who took time out of their busy schedules to help us. Thanks for your help and please give me a call if you have questions. JB

Jodi L. Bush  
Field Supervisor  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225, ext.205

----- Forwarded message -----

**From:** **Zelenak, Jim** <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>  
**Date:** Thu, Dec 10, 2015 at 1:24 PM  
**Subject:** Re: trip to MLPS  
**To:** "McKelvey, Kevin -FS" <[kmckelvey@fs.fed.us](mailto:kmckelvey@fs.fed.us)>  
**Cc:** "Steele, Roberta F -FS" <[rfsteele@fs.fed.us](mailto:rfsteele@fs.fed.us)>, "Squires, John -FS" <[jsquires@fs.fed.us](mailto:jsquires@fs.fed.us)>, "Schwartz, Michael K -FS" <[michaelkschwartz@fs.fed.us](mailto:michaelkschwartz@fs.fed.us)>, Jodi Bush <[jodi\\_bush@fws.gov](mailto:jodi_bush@fws.gov)>, Sharon Hooley <[Sharon\\_Hooley@fws.gov](mailto:Sharon_Hooley@fws.gov)>, Kaimy Marks <[kaimy\\_marks@fws.gov](mailto:kaimy_marks@fws.gov)>

Kevin,

I just spoke with our Administration folks here and they informed me that you, John, and Mike are all covered by a single interagency agreement that for unknown reasons has gotten hung up at our regional office. Kaimy and Sharon here in Helena have been working to get this resolved, and I will forward you their most recent correspondence with the regional office so you (and John and Mike) have a better idea of where things are at. We will continue to push on this and expect to have it resolved and you three reimbursed soon.

Sorry, and thanks for your patience.

On Thu, Dec 10, 2015 at 1:00 PM, McKelvey, Kevin -FS <[kmckelvey@fs.fed.us](mailto:kmckelvey@fs.fed.us)> wrote:

Jim, hate to bug you, but I am still waiting for reimbursement for the trip to MLPS. I have a

bill of ~1000 on my gov credit card and it's getting bigger daily. So if you can provide some push to make this so, I would be deeply appreciative. Thanks. K.



**Kevin S. McKelvey, PhD**  
**Research Ecologist**  
**Forest Service**

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**From:** [Zelenak, Jim](#)  
**To:** [Erin Simons-Legaard](#)  
**Subject:** Re: Canada Lynx Expert Elicitation Workshop Notes  
**Date:** Friday, December 11, 2015 11:10:27 AM

---

Thanks Erin!

On Fri, Dec 11, 2015 at 9:08 AM, Erin Simons-Legaard <[erin.simons@maine.edu](mailto:erin.simons@maine.edu)> wrote:  
Hi Jim,

Sorry I didn't get this to you by Monday. I only added a few brief comments/suggestions on the notes pertaining to my presentation in the hopes of adding a little additional detail or clarity.

Best,  
Erin

Erin Simons-Legaard  
Research Assistant Professor  
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On Tue, Nov 24, 2015 at 3:22 PM, Zelenak, Jim <[jim.zelenak@fws.gov](mailto:jim.zelenak@fws.gov)> wrote:  
All:

Attached please find the notes taken during the workshop. They have been reviewed (and in some cases amended with notes taken separately) by the SSA Core Team members. Please review these notes, make any necessary corrections and/or clarifications using "Track Changes," add any additional thoughts or considerations (on the science or workshop proceedings, not on policy/listing considerations) in the space provided at the end of this document, and return via email to [jim.zelenak@fws.gov](mailto:jim.zelenak@fws.gov) by Monday, Dec. 7, 2015.

Presentations and handouts referenced in these notes will be sent via separate emails.

We will prepare and disseminate to workshop participants a Workshop Report summarizing the proceedings and providing the Service's analysis and assessment of the information gathered at the workshop. That report will also include these notes and corrections/clarifications provided by participants.

We may also follow-up with lynx experts individually or as a group with additional questions generated by the workshop.

Let me know if you have questions.

--

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--

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**From:** [McCollough, Mark](#)  
**To:** [Dan Harrison](#); [Jen Vashon](#); [Erin Simons-Legaard](#); [Jim Zelenak](#)  
**Subject:** New paper on lynx genetics and dispersal in eastern N. America  
**Date:** Monday, December 14, 2015 10:05:24 AM

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A relatively new paper from researchers at Trent University...

<http://www.nrcresearchpress.com/doi/pdf/10.1139/cjz-2014-0227>



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Mark McCollough, Ph.D.  
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**From:** [Patricia Bergstrom](#)  
**To:** [Jodi Bush](#)  
**Cc:** [Kaimy Marks](#); [Sharon Hooley](#); [Patricia Bergstrom](#); [Eileen Lindgren](#)  
**Subject:** RE: trip to MLPS  
**Date:** Monday, December 14, 2015 11:11:25 AM  
**Attachments:** [image001.png](#)  
[image002.png](#)  
[image003.png](#)  
[image004.png](#)

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Jodi,

If I can have a document number I will do a follow-up if this has not been answered.

Pat

Patricia M. Bergstrom  
Administrative Officer-Ecological Services  
U.S. Fish and Wildlife Service  
134 Union Blvd., Lakewood, Colorado 80228  
Mountain Prairie Region  
Office: (303) 236-4217  
Fax: (303) 236-0027  
[patricia\\_bergstrom@fws.gov](mailto:patricia_bergstrom@fws.gov)  
M-F 6:30AM to 3:00 PM MST

**From:** Bush, Jodi [mailto:[jodi\\_bush@fws.gov](mailto:jodi_bush@fws.gov)]  
**Sent:** Thursday, December 10, 2015 1:41 PM  
**To:** Patricia Bergstrom  
**Cc:** Kaimy Marks; Sharon Hooley  
**Subject:** Fwd: trip to MLPS

Pat can you help us with this?

We have a few FS folks that we invited to come to our Lynx workshop in October in Minnesota. We said we would reimburse their travel expenses but for unknown reasons the agreement is still sitting in the CGS weeks after it got sent there.

I thought maybe you could help us figure it out as I really think this is not the way to treat fellow Federal agency folks who took time out of their busy schedules to help us. Thanks for your help and please give me a call if you have questions. JB

Jodi L. Bush  
Field Supervisor  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225, ext.205

----- Forwarded message -----

From: **Zelenak, Jim** <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)>

Date: Thu, Dec 10, 2015 at 1:24 PM

Subject: Re: trip to MLPS

To: "McKelvey, Kevin -FS" <[kmckelvey@fs.fed.us](mailto:kmckelvey@fs.fed.us)>

Cc: "Steele, Roberta F -FS" <[rfsteele@fs.fed.us](mailto:rfsteele@fs.fed.us)>, "Squires, John -FS" <[jsquires@fs.fed.us](mailto:jsquires@fs.fed.us)>, "Schwartz, Michael K -FS" <[michaelkschwartz@fs.fed.us](mailto:michaelkschwartz@fs.fed.us)>, Jodi Bush <[jodi\\_bush@fws.gov](mailto:jodi_bush@fws.gov)>, Sharon Hooley <[Sharon\\_Hooley@fws.gov](mailto:Sharon_Hooley@fws.gov)>, Kaimy Marks <[kaimy\\_marks@fws.gov](mailto:kaimy_marks@fws.gov)>

Kevin,

I just spoke with our Administration folks here and they informed me that you, John, and Mike are all covered by a single interagency agreement that for unknown reasons has gotten hung up at our regional office. Kaimy and Sharon here in Helena have been working to get this resolved, and I will forward you their most recent correspondence with the regional office so you (and John and Mike) have a better idea of where things are at. We will continue to push on this and expect to have it resolved and you three reimbursed soon.

Sorry, and thanks for your patience.

On Thu, Dec 10, 2015 at 1:00 PM, McKelvey, Kevin -FS <[kmckelvey@fs.fed.us](mailto:kmckelvey@fs.fed.us)> wrote:  
Jim, hate to bug you, but I am still waiting for reimbursement for the trip to MLPS. I have a bill of ~1000 on my gov credit card and it's getting bigger daily. So if you can provide some push to make this so, I would be deeply appreciative. Thanks. K.



**Kevin S. McKelvey, PhD**  
**Research Ecologist**

**Forest Service**

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(406) 449-5225 ext. 220  
[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)





**From:** [Bush, Jodi](#)  
**To:** [Patricia Bergstrom](#)  
**Cc:** [Kaimy Marks](#); [Sharon Hooley](#)  
**Subject:** Re: trip to MLPS  
**Date:** Monday, December 14, 2015 11:14:09 AM  
**Attachments:** [image001.png](#)  
[image002.png](#)  
[image003.png](#)  
[image004.png](#)

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thanks for your help Pat. Kaimy will send you what she has. JB

Jodi L. Bush  
Field Supervisor  
Montana Ecological Services Office  
585 Shepard Way, Suite 1  
Helena, MT 59601  
(406) 449-5225, ext.205

On Mon, Dec 14, 2015 at 11:11 AM, Patricia Bergstrom <[patricia\\_bergstrom@fws.gov](mailto:patricia_bergstrom@fws.gov)> wrote:

Jodi,

If I can have a document number I will do a follow-up if this has not been answered.

Pat

Patricia M. Bergstrom  
Administrative Officer-Ecological Services  
U.S. Fish and Wildlife Service  
134 Union Blvd., Lakewood, Colorado 80228  
Mountain Prairie Region  
Office: (303) 236-4217  
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**Date:** Thu, Dec 10, 2015 at 1:24 PM  
**Subject:** Re: trip to MLPS  
**To:** "McKelvey, Kevin -FS" <[kmckelvey@fs.fed.us](mailto:kmckelvey@fs.fed.us)>  
**Cc:** "Steele, Roberta F -FS" <[rfsteele@fs.fed.us](mailto:rfsteele@fs.fed.us)>, "Squires, John -FS" <[jsquires@fs.fed.us](mailto:jsquires@fs.fed.us)>, "Schwartz, Michael K -FS" <[michaelkschwartz@fs.fed.us](mailto:michaelkschwartz@fs.fed.us)>, Jodi Bush <[jodi\\_bush@fws.gov](mailto:jodi_bush@fws.gov)>, Sharon Hooley <[Sharon\\_Hooley@fws.gov](mailto:Sharon_Hooley@fws.gov)>, Kaimy Marks <[kaimy\\_marks@fws.gov](mailto:kaimy_marks@fws.gov)>

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**Research Ecologist**  
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[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)

**From:** [McCollough, Mark](#)  
**To:** [Jim Zelenak](#)  
**Subject:** McCollough review of Simon-Legaard and Vashon comments on workshop notes  
**Date:** Monday, December 14, 2015 11:52:26 AM

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Jim:

I've reviewed both Erin and Jen's reviews on the workshop notes that you shared with me on Google Drive. I have no comments on Erin's review. I include several comments in the margin on Jen's comments.

This brings of the question of whether we need 2nd and 3rd tier review of comments. For example, if Jen suggests changes the meeting notes on someone's presentation, should we let the person that gave the presentation review and concur? In some places in the notes, Jen and my recollection, personal notes, or interpretation of what was said were different.

thanks, Mark

--

Mark McCollough, Ph.D.  
Endangered Species Specialist  
Maine Field Office  
U. S. Fish and Wildlife Service  
17 Godfrey Drive, Suite 2  
Orono, ME 04473  
Phone 207 866-3344 x115  
Cell Phone: 207 944-5709  
[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)

**From:** [McCollough, Mark](#)  
**To:** [Tur, Anthony](#)  
**Subject:** Re: Lynx and the St. Lawrence River  
**Date:** Monday, December 14, 2015 11:58:23 AM

---

Tony: Thanks for sending along. I saw an earlier draft of the paper, but not the final.

Jeff Bowman was at the lynx workshop in MN for the lynx SSA. He presented on these results as did Mike Schwartz at the Rocky Mountain Research Station. Maine Department of Inland Fisheries and Wildlife is initiating a study with a UMass doctoral student to map the entire genome of bobcats and lynx and compare genetics across N. America.

You are welcome to participate in monthly calls from the Jim Zelenak and the lynx core team for updates on the SSA. I believe you are on our email list for the call announcements. Let me know if you are not.

Only four lynx reported incidentally trapped this season (vs. 20 last year). Not sure what is happening. Some believe fewer trappers are trapping?, perhaps avoiding northern Maine?, perhaps fewer lynx?, perhaps a problem with reporting? or a combination of factors. Its not the weather. It has been ideal trapping conditions - mild right through December, almost no snow, compared to last year when the ground was covered starting in early November!

Hope your are doing well and able to take some time off over Christmas.

Mark

On Mon, Dec 14, 2015 at 9:05 AM, Tur, Anthony <[anthony\\_tur@fws.gov](mailto:anthony_tur@fws.gov)> wrote:

Mark,

Not sure if you've seen this, but relevant to our past CH discussions and possibly future recovery planning.

Hope all is well.

Tony

<http://www.nrcresearchpress.com/doi/pdf/10.1139/cjz-2014-0227>

--

Anthony Tur  
Endangered Species Biologist  
U.S. Fish and Wildlife Service  
New England Field Office  
70 Commercial Street, Suite 300  
Concord, New Hampshire 03301

Phone (603) 223-2541

[Anthony\\_Tur@fws.gov](mailto:Anthony_Tur@fws.gov)

<http://www.fws.gov/newengland/>

--

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Phone 207 866-3344 x115  
Cell Phone: 207 944-5709  
[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)

**From:** [McCollough, Mark](#)  
**To:** [Dan Harrison](#); [Jen Vashon](#); [Erin Simons-Legaard](#); [Jim Zelenak](#)  
**Subject:** New paper on lynx genetics and dispersal in eastern N. America  
**Date:** Monday, December 14, 2015 12:05:21 PM

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A relatively new paper from researchers at Trent University...

<http://www.nrcresearchpress.com/doi/pdf/10.1139/cjz-2014-0227>



--

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[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)



**From:** [McCollough, Mark](#)  
**To:** [Jim Zelenak](#)  
**Subject:** McCollough review of Simon-Legaard and Vashon comments on workshop notes  
**Date:** Monday, December 14, 2015 1:52:23 PM

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Cell Phone: 207 944-5709  
[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)

**From:** [Bell, Heather](#)  
**To:** [Zelenak, Jim](#)  
**Cc:** [McCollough, Mark](#); [Mary Parkin](#); [Jonathan Cummings](#)  
**Subject:** Re: McCollough review of Simon-Legaard and Vashon comments on workshop notes  
**Date:** Tuesday, December 15, 2015 11:31:15 AM

---

Yes!

Heather Bell  
Ecological Services HQ  
Branch of Conservation Integration  
SSA Framework Team Lead  
Remotely Located at  
134 S. Union Blvd  
Lakewood, CO 80228  
303-236-4514

Check it out! SSA Framework - Google Site for Staff  
at <https://sites.google.com/a/fws.gov/ssa/> and the REV Google Site: <https://sites.google.com/a/fws.gov/rev/>

On Tue, Dec 15, 2015 at 8:23 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

I saw your responses to Jen's comments. My understanding is that we will incorporate participant's corrections/clarifications of their own presentation and/or comments/responses as annotations (in parentheses and/or italics)- unless they have supplied new or reconsidered opinion that was not presented/discussed at the workshop.

Where participant's have commented on the presentations, comments, or responses of other presenters/participants, as Jen did with Erin's and others' presentations, we may need to follow up with the original presenter to see if we missed or misinterpreted something.

For example, we had in the notes that Karen Hodges said pellet surveys were best for estimating variance but, in his review, Jake Ivan said he did not think this was the case. I intend to forward that section of our notes to Karen along with Jake's comment (though anonymously, not attributed to him) and ask her if we misquoted her or if she would like to respond to the anonymous comment.

It would be helpful if you could do the same/similar with regard to Jen's comments on Erin's and other presentations.

For both Karen/Jake and Erin/Jen (perhaps others) - we would have to explain in the annotations that we received question/comment during participant review of workshop notes, some of which required follow-up with presenters, and then summarize that follow-up in the annotation to that point(s) in the final notes.

Let me know if you have questions.

Mary/Heather/Jonathan - let me know if this comports with what we've discussed (MP/HB) and/or is consistent with how you think we ought to go about this (JC). Thanks.

On Mon, Dec 14, 2015 at 11:52 AM, McCollough, Mark <[mark\\_mccollough@fws.gov](mailto:mark_mccollough@fws.gov)> wrote:

Jim:

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# The Influence of Snowmobile Trails on Coyote Movements during Winter in High-Elevation Landscapes

Eric M. Gese<sup>1\*</sup>, Jennifer L. B. Dowd<sup>2</sup>, Lise M. Aubry<sup>2</sup>

**1** United States Department of Agriculture, Wildlife Services, National Wildlife Research Center, Department of Wildland Resources, Utah State University, Logan, Utah, United States of America, **2** Department of Wildland Resources, Utah State University, Logan, Utah, United States of America

## Abstract

Competition between sympatric carnivores has long been of interest to ecologists. Increased understanding of these interactions can be useful for conservation planning. Increased snowmobile traffic on public lands and in habitats used by Canada lynx (*Lynx canadensis*) remains controversial due to the concern of coyote (*Canis latrans*) use of snowmobile trails and potential competition with lynx. Determining the variables influencing coyote use of snowmobile trails has been a priority for managers attempting to conserve lynx and their critical habitat. During 2 winters in northwest Wyoming, we backtracked coyotes for 265 km to determine how varying snow characteristics influenced coyote movements; 278 km of random backtracking was conducted simultaneously for comparison. Despite deep snow (>1 m deep), radio-collared coyotes persisted at high elevations (>2,500 m) year-round. All coyotes used snowmobile trails for some portion of their travel. Coyotes used snowmobile trails for 35% of their travel distance (random: 13%) for a mean distance of 149 m (random: 59 m). Coyote use of snowmobile trails increased as snow depth and penetrability off trails increased. Essentially, snow characteristics were most influential on how much time coyotes spent on snowmobile trails. In the early months of winter, snow depth was low, yet the snow column remained dry and the coyotes traveled off trails. As winter progressed and snow depth increased and snow penetrability increased, coyotes spent more travel distance on snowmobile trails. As spring approached, the snow depth remained high but penetrability decreased, hence coyotes traveled less on snowmobile trails because the snow column off trail was more supportive. Additionally, coyotes traveled closer to snowmobile trails than randomly expected and selected shallower snow when traveling off trails. Coyotes also preferred using snowmobile trails to access ungulate kills. Snow compaction from winter recreation influenced coyote movements within an area containing lynx and designated lynx habitat.

**Citation:** Gese EM, Dowd JLB, Aubry LM (2013) The Influence of Snowmobile Trails on Coyote Movements during Winter in High-Elevation Landscapes. PLOS ONE 8(12): e82862. doi:10.1371/journal.pone.0082862

**Editor:** Matt Hayward, Bangor University, United Kingdom

**Received:** August 6, 2013; **Accepted:** November 6, 2013; **Published:** December 18, 2013

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**Funding:** The research was supported by funding from the United States Department of Agriculture, Wildlife Services, National Wildlife Research Center; the United States Forest Service, Bridger-Teton National Forest; and Endeavor Wildlife Research Foundation. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

**Competing Interests:** The authors have declared that no competing interests exist.

\* E-mail: eric.gese@usu.edu

## Introduction

Intraspecific competition between sympatric carnivores has long been of interest to ecologists and managers. Understanding the interactions and fundamental relationships between competing species can lead to more informed management and conservation decisions. Coyotes (*Canis latrans*) and Canada lynx (*Lynx canadensis*) are sympatric carnivores in many areas of North America. Conservation and management activities for Canada lynx in the contiguous United States have increased to enhance species recovery and protect critical habitats. Since their listing in 2000 [1], determining appropriate management approaches to minimize adverse impacts and maximize species recovery is essential for many land agencies managing lynx habitat [2]. Concerns regarding the relationship between snowmobile activity and coyote presence within winter habitats used by lynx remain a focal point for many management agencies. Conflicting pieces of information suggest varying degrees of coyote dependence on snowmobile trails [3–4], and therefore the potential for varying impacts of coyotes on local lynx populations. We hypothesize that the regional differences in snow depth and supportiveness, terrain,

recreation use, lynx density, available food, suitable habitat, and/or species dynamics may account for this variation in the dependence of coyotes using trails compacted by snowmobiles [3–4].

Coyotes are one of the most successful generalist predators in North America and are highly adaptive to human-modified environments. In regions where seasonal activity is dictated by winter climates, coyotes alter their behaviors to negate the impacts of deep snow by using areas and habitats where snow is shallower and more supportive [4–5]. Due to their high foot-load to body-mass, coyotes have a greater sinking depth than lynx, thereby making travel and hunting in deep snow terrains more energetically expensive [6]. Lynx have specially adapted feet resulting in a lower foot-load to body-mass, giving them a competitive advantage over coyotes during winter [7–9]. Therefore, ecologists have hypothesized that where coyotes and lynx inhabit the same geographical areas, the two species may occupy separate niches seasonally due to fluctuations in snow characteristics, with coyote's primarily occurring in lower elevations with more supportive snow during winter and lynx occurring in higher elevations with deeper snow [5]. However, this hypothesis remains largely untested.

Increased winter recreation creates an increase of compacted snow surfaces, thereby providing an opportunity for coyotes to exploit deep snow conditions and utilize resources year round. In the Intermountain West, coyotes have been documented using snowmobile trails to travel, hunt and persist in otherwise inaccessible winter terrain [3]. Researchers suggested the continued use of snowmobiles may result in consistent compacted trails within lynx conservation areas which may have detrimental impacts to local lynx populations in the Intermountain West [3].

The growing popularity of snowmobiles, combined with recent technological advances (lighter and more powerful snowmobiles), has enabled greater access to backcountry terrain, expansion of trail grooming, and an increase in off-trail use by winter recreationists. In light of this, management has focused on determining if snowmobile use has the potential to influence ecosystem dynamics. Studies suggest increased competition between coyotes and lynx resulting from snow compaction would most likely occur during the fall and winter [4,10–11] when coyotes use snow-compacted paths to travel and hunt [3,7,12]. Understanding how coyote behaviors are influenced by winter recreation (particularly their use of snowmobile trails within habitats used by lynx) is necessary for understanding how lynx populations might be impacted by management plans in critical lynx habitat. The objective of this study was to quantify the influence of snow compaction created by snowmobiles on coyote winter movements in deep snow terrain, with a comparison to the only study [4] using similar field collection methodologies. This comparison will be useful to inform land management agencies that regional differences in winter precipitation regimes (i.e., snow depth, snow compaction) may lead to different interactions among coyotes, lynx, and snowmobiles.

## Methods

### Ethics Statement

Fieldwork was approved and sanctioned by the United States Department of Agriculture's National Wildlife Research Center and the United States Forest Service. Permission to access land in the Bridger-Teton National Forest was obtained from the United States Forest Service.

Capture and handling protocols were reviewed and approved by the Institutional Animal Care and Use Committees (IACUC) at the United States Department of Agriculture's National Wildlife Research Center (QA-1389) and Utah State University (#1294). No permit to capture and handle coyotes was required by the Wyoming Game and Fish Department.

### Study Area

We conducted this study on the east and west sides of Togwotee Pass in northwestern Wyoming. The 512-km<sup>2</sup> study area was composed of the Bridger-Teton and Shoshone National Forests, plus privately owned ranches. Elevations ranged from 1,800 m to >3,600 m. The area was characterized by short, cool summers (mean temperature of 12°C) and long winters (mean temperature of -8°C). Precipitation occurred mostly as snow; cumulative monthly snow depth for the winter study season (December–April) averaged 226.6, 149.4, and 228.9 cm during 2006, 2007, and 2008, respectively [13]. Snowmobiling was extensive during winter with riders accessing both groomed trails and areas for off-trail riding once snow conditions permitted (October through May). Grooming of trails began in December with trails maintained through April 1 depending on snowfall. Wyoming's Continental Divide Snowmobile Trail was considered one of the top trail systems in the west [14].

Habitats varied between the east and west sides of the pass, with the eastern side classified as dry and the western side as wet. Plant communities included cottonwood (*Populus angustifolia*) riparian zones, interspersed with sagebrush (*Artemisia* spp.) uplands and willow (*Salix* spp.) -wetland communities at lower elevations. At intermediate elevations, aspen (*Populus tremuloides*), Douglas fir (*Pseudotsuga menziesii*), and lodgepole pine (*Pinus contorta*) were the dominant species. Whitebark pine (*Pinus albicaulis*), spruce (*Picea engelmannii*), and sub-alpine fir (*Abies lasiocarpa*) were the primary tree species at higher elevations.

The study area has a diverse assemblage of predators. Although wolves were extirpated from Wyoming by the 1930's, they have since re-established as a result of the 1995 re-introduction efforts in Yellowstone National Park. Other carnivores aside from coyotes and lynx included cougar (*Puma concolor*), wolverine (*Gulo gulo*), grizzly bear (*Ursus arctos*), black bear (*U. americanus*), bobcat (*L. rufus*), red fox (*Vulpes vulpes*), and pine marten (*Martes americana*). Ungulate species in the area included elk (*Cervus elaphus*), moose (*Alces alces*), bison (*Bison bison*), bighorn sheep (*Ovis canadensis*), mule deer (*Odocoileus hemionus*), and white-tailed deer (*O. virginianus*). Pronghorn antelope (*Antilocapra americana*) were in the area only during the summer. Potential prey for coyotes and lynx included snowshoe hare (*Lepus americanus*), red squirrel (*Tamiasciurus hudsonicus*), Uinta ground squirrel (*Spermophilus armatus*), black-tailed jackrabbit (*Lepus californicus*), cottontail rabbit (*Sylvilagus* spp.), ruffed grouse (*Bonasa umbellus*), blue grouse (*Dendragapus obscurus*), northern flying squirrel (*Glaucomys sabrinus*), deer mouse (*Peromyscus maniculatus*), voles (*Microtus* spp.), gophers (*Thomomys* spp.), and various cricketid species.

### Animal Capture and Backtracking

We captured coyotes across the study area in the summer and fall using padded-jaw leg-hold traps with attached tranquilizer tabs. We also captured coyotes during winter by placing road-kill deer and elk carcasses in open meadows around the study area and using snowmobiles with nets, or net-gunning from a helicopter [15]. Coyotes were radio-collared with a very high frequency (VHF) transmitter and released at the capture site; animals were handled without immobilizing drugs. Radio-collared animals were relocated throughout the year using conventional radio-telemetry techniques (homing in or triangulation) to determine year-round territory occupancy, survival, and residency status.

We backtracked radio-collared coyotes during the winters of 2006–2007 and 2007–2008 following methods developed at Seeley Lake, Montana [4], to quantify the influence of snow compaction on coyote movements in an area where lynx, coyotes, and snowmobiles occurred, and allowed for comparison to results from studies in geographically separate regions [4]. In an effort to determine if various snow column characteristics, with particular emphasis on differences in snow supportiveness, would influence the dependence of coyotes on snowmobile trails for movement, we sampled individuals residing on the east, west, and continental divide of Togwotee Pass. We used data collected during the backtracking of individuals to determine the variance from random expectation of the distance a coyote would travel on a snowmobile trail (dependent variable) and the influence of various environmental variables, including the rate of prey and predator track encounters, snow depth, snow penetrability, and the distance a coyote traveled off of the nearest snowmobile trail.

We randomly selected individual coyotes for backtracking using a computer generated randomization sequence (SAS Institute Inc., Cary North Carolina, USA) to avoid bias and ensure all coyotes were sampled randomly, yet equally. Once selected, coyotes were located by triangulation using  $\geq 3$  azimuths, and their position

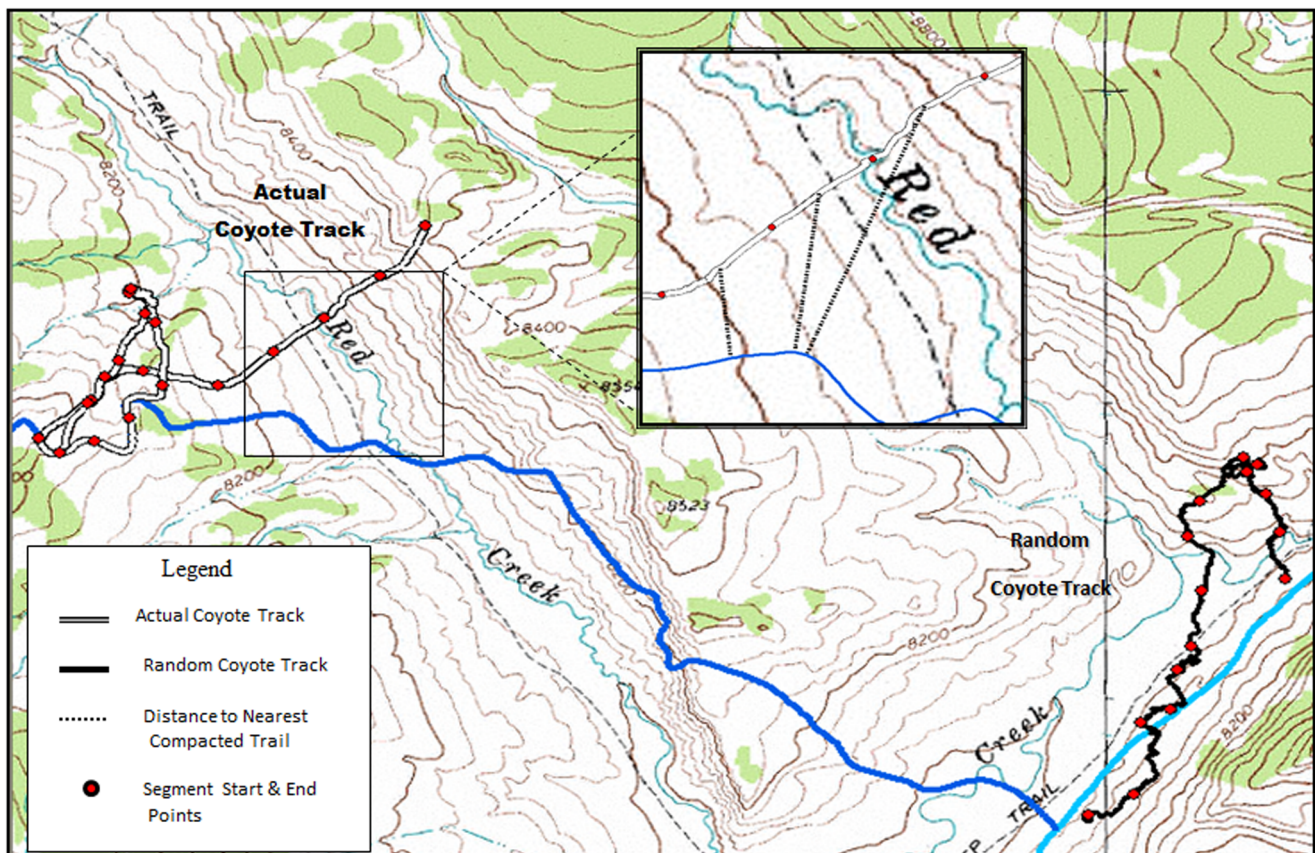


projected using LOCATE II (Nova Scotia Agricultural College, Truro, Nova Scotia, Canada). Once the track location was verified, a starting location for the actual track was then used to generate a starting location for the random track. Random tracks were created using digital layers from previously documented coyote tracks in a random direction and orientation, 3 km distance from the actual start point of the individual being tracked that day (Figure 1). This procedure and projection distance was used to ensure sampling independence (i.e., the actual and random tracks could not intersect) from the actual track and, for statistical purposes, for comparing data from the actual coyote track to random tracks [4].

The direction and projection of random tracks were generated randomly using SAS (SAS Institute Inc. 1999), by creating a randomized sequence selected from values between 1 and 360 (representing degrees); one randomization sequence was created for the direction, and one for the projection. Before going into the field, the random track created for that day was overlaid onto a topographic map using ArcGIS (ESRI, Redlands, California) to ensure field personnel were capable of conducting a track survey in the terrain where it had been randomly projected. If the random track had been projected in an avalanche path or dangerous/unattainable terrain, the track was re-projected to ensure safety of personnel, using a second set of projected numbers from the randomized sequence. If the terrain was considered acceptable, the random track layer was permanently saved onto a digital map, transferred to a handheld computer (Trimble GeoExplorer® series

3, Sunnyvale, California) and taken into the field. The only reason a track was ever re-projected was for safety reasons. Therefore ensuring random tracks were not projected in areas simply because they were easy to access or conduct track surveys in, eliminating potential surveyor bias of roads, terrain and snow compaction.

Backtracking began in the morning after night movements had taken place and before the snow column deteriorated. We conducted both actual and random track surveys by teams of 2 field personnel, taking measurements and recording data for  $\geq 3$  km of tracking. Start locations were reached using pre-existing trails to avoid additional compaction within the study area. Teams commenced backtracking of actual and random tracks simultaneously. Using the a handheld computer (Trimble GeoExplorer, Sunnyvale, California, USA), we collected all data in digital format using a datasheet generated with the computer software GPS Pathfinder Office (Trimble Navigation Limited, Westminster, Colorado, USA). At the start of each track, we recorded initial track information including observers, start time, start location, temperature, elevation, and a classification (high, medium, low) of snowmobile use in the area. Classes of high, medium, and low levels of snowmobile use were determined by visually assessing from the ground the amount of terrain covered by snowmobile tracks within a 1 km buffer of the track. A high classification was terrain with snowmobile tracks covering  $>60\%$  of the ground within the buffer zone; snowmobile tracks covering  $<10\%$  of the area was considered low; tracks covering 11–59% of the area was considered medium use.



**Figure 1. Comparison of an actual and random coyote track documented on 15 February 2008, Togwotee Pass, Wyoming.** Inset shows how distance to nearest compacted trail was calculated by finding the centroid point for each segment within a given track and measuring the distance (m) to the nearest groomed snowmobile trail. Blue line denotes a snowmobile trail. doi:10.1371/journal.pone.0082862.g001

During the actual backtrack of a coyote, Pathfinder software recorded UTM locations every 5 seconds along a given track. We recorded point locations every time a habitat change was encountered, organizing the track into distinct but consecutive segments [4]. We considered groomed trails a distinct habitat type. We documented coyote travel distance on and off snowmobile trails by track segments with start and end points marking transitions within habitats. We identified prey and predator track crossings as point locations, and recorded the number and species every time a prey or predator's track crossed a coyote travel path. During the entire backtrack (whether on or off a snowmobile trail), we measured the snow depth with every habitat change and every 200 m along the track using an avalanche probe (marked in cm) to measure from the snow surface to the ground. We documented an index of snow penetrability whenever the habitat changed and every 200 m along the entire backtrack by dropping a 100 g weight from 1 m above the snow surface and measuring the distance of penetration below the surface [4]. All established snowmobile trails, including groomed trails and off-trail snowmobile tracks, within 1 km of both actual and random tracks were recorded for measuring coyote distance to the nearest snowmobile trail. Trails made by field personnel while conducting the survey were not recorded as these occurred after the coyote had traveled the actual route the previous night. We measured all variables similarly along both actual and random tracks.

After the actual and random tracks were completed, data recorded on the Trimble units were downloaded and imported into GPS Pathfinder Office. Once imported, we differentially corrected the tracks to enhance location data quality. Tracks were then smoothed to eliminate bounce or GPS scatter caused by canopy cover or varying topography which can influence location accuracy [16]. All tracks were converted to ArcGIS files for analysis. We determined coyote travel distance to the nearest snowmobile trail (Figure 1) by calculating a centroid point for each segment along a given coyote track, then measuring the distance from the centroid point to the nearest snowmobile trail [4].

## Data and Statistical Analyses

We compiled backtrack data into track pairs by individual and date. We divided tracks into "compacted" and "non-compacted" categories, then divided into segments (based upon habitat transition) to compute mean prey track encounters (per km), mean predator track encounters (per km), mean snow depth (cm), and mean snow penetration (cm). Snow depth and penetration measurements were recorded every 200 m along both actual and random tracks. Once calculated for each segment, variables were averaged for compacted and non-compacted categories and the number of segments per track and mean segment distance were determined. We divided the distance traveled on and off snowmobile trails by the total track distance to determine percent use of snowmobile trails for each track pair.

To determine if coyotes traveled closer to a snowmobile trail during specific winter months, we compared distance from an actual coyote track to the closest snowmobile trail by month and year for both random and actual tracks. Our sampling unit was defined as each track pair, consisting of one actual and one random coyote track for any given day. Snow depth and snow penetration were averaged for each track segment to produce an overall average for each track. Distance from the actual coyote track to the nearest snowmobile trail was determined by calculating a distance for each segment on a given track and averaging those distances to produce a single mean distance for each track (Figure 1). Distances to the nearest snowmobile trail of actual tracks versus random tracks were compared using a paired

sample t-test available in the 'stats' library using the `t.test` function with a paired sample specification (R software, version 2.6.2). This test calculates the difference between each actual and random paired tracks and then tests whether the average differs from zero.

To determine how snow depth and snow penetration encountered by coyotes influenced their use of snowmobile trails, we conducted correlation analyses by comparing the percentage of snowmobile trails used by coyotes during actual backtracks, versus the average snow depth encountered on snowmobile trails, the average snow depth encountered off trails, the average snow penetration encountered on trails, and the average snow penetration encountered off trails. We used linear regression analyses (SPSS 10.0, Chicago, Illinois, USA) to determine how each variable (snow depth on, snow depth off, snow penetration on, snow penetration off) influenced the percent use of snowmobile trails by coyotes.

To determine how large prey items influenced coyote movement, we compared the use of snowmobile trails on all actual tracks containing ungulate kills to those where ungulate kills were not documented. Tracks were categorized by either presence (1) or absence (0) of an ungulate kill, as documented during actual coyote backtracks. A distance ratio was calculated by dividing the actual distance traveled by a coyote (using snow-compacted surfaces) by the shortest possible travel distance possible, projected from start to finish points. This distance ratio was then compared between tracks with versus without an ungulate kill using a paired sample t-test available in the 'stats' library using the `t.test` function with a paired sample specification (R software, version 2.6.2) to determine whether coyotes preferentially used snowmobile trails when accessing large prey items rather than traveling the shortest direct distance.

The Multi-Response Permutation Procedure (MRPP) [17] was used to test for differences in variable means between random tracks and the actual tracks. We used the procedure 'mrpp' implemented in the R library 'vegan' (R software, version 2.6.2) [18]. MRPP tests whether there is a significant difference between 2 or more groups of sampling units, thus allowing us to compare variables from each track pair (actual and random) by day. This method is similar to a simple analysis of variance as it compares dissimilarities within and among groups based on *P*-value statistics [19]. The MRPP was applied to a number of variables; we calculated the means of each variable and assessed if they were significantly different between actual and random tracks. We first investigated differences in those means for the following variables: level of snowmobile use, snow depth, and snow penetration. To obtain a mean value of snowmobile use (classified as low, medium or high) for both actual and random tracks, we transformed snowmobile use into an ordinal variable (i.e., 1, 2, 3, replaced low, medium, and high). We also tested for differences in prey-related variables: rate of encountering tracks left by rodents, red squirrels, snowshoe hares, and ungulates. Additionally, we examined predator avoidance using the rate of wolf track encounters along the actual and random tracks.

We were interested in understanding which factors (i.e., coyote identity, level of snowmobile use, snow depth, snow penetration, rodents, red squirrels, snowshoe hares, ungulates, and wolf track encounters) on and off the snowmobile trails could explain the percentage of time coyotes spend on snowmobile trails (i.e., '%Track'). To address this question, we used beta-regression mixed models via the 'betamix' procedure implemented in the R library 'betareg' (R software version 2.6.2) [18]. Mixed beta regression models can be implemented in situations where the dependent variable (%Track) is continuous and restricted to the unit interval 0–1, such as proportions or rates [20]. Mixed beta-

**Table 1.** Comparisons of variable means ( $\pm$ SE) between compacted (used as a snowmobile trail) and non-compacted (undisturbed) track portions from actual (265.05 km) and random (278.54 km) coyote tracks recorded in the Togwotee Pass study area, northwestern Wyoming, 2006 – 2008.

| Variable                          | Actual tracks    |                   | Random tracks    |                   |
|-----------------------------------|------------------|-------------------|------------------|-------------------|
|                                   | Compacted        | Non-compacted     | Compacted        | Non-compacted     |
| Total distance traveled (km)      | 85.94            | 179.58            | 34.07            | 244.47            |
| Mean% distance of track           | 34.52 $\pm$ 3.04 | 65.56 $\pm$ 3.11  | 13.17 $\pm$ 2.57 | 86.89 $\pm$ 2.56  |
| Mean snow depth (cm)              | 78.6 $\pm$ 5.43  | 91.4 $\pm$ 3.84   | 93.2 $\pm$ 6.09  | 104.4 $\pm$ 5.15  |
| Mean penetration (cm)             | 11.9 $\pm$ 0.98  | 19.3 $\pm$ 1.11   | 12.9 $\pm$ 1.43  | 20.2 $\pm$ 1.01   |
| # segments/track                  | 11.9 $\pm$ 0.83  | 21.89 $\pm$ 1.35  | 5.32 $\pm$ 0.66  | 20.37 $\pm$ 0.97  |
| Mean travel distance/segment (km) | 0.124 $\pm$ 0.01 | 0.105 $\pm$ 0.01  | 0.078 $\pm$ 0.01 | 0.206 $\pm$ 0.01  |
| Distance to snowmobile trail (m)  | 0                | 142.5 $\pm$ 27.91 | 0                | 238.6 $\pm$ 34.82 |
| Predator track crossings          | 5.38 $\pm$ 0.79  | 3.61 $\pm$ 0.83   | 6.30 $\pm$ 0.50  | 4.87 $\pm$ 0.43   |
| Wolves/km                         | 0.53 $\pm$ 0.24  | 0.19 $\pm$ 0.11   | 0.11 $\pm$ 0.09  | 0.19 $\pm$ 0.16   |
| Prey track crossings              | 12.74 $\pm$ 1.45 | 12.18 $\pm$ 1.53  | 5.31 $\pm$ 1.06  | 16.56 $\pm$ 1.60  |
| Rodents/km                        | 0.68 $\pm$ 0.27  | 0.27 $\pm$ 0.06   | 0.85 $\pm$ 0.43  | 0.49 $\pm$ 0.14   |
| Red squirrels/km                  | 2.60 $\pm$ 0.66  | 3.10 $\pm$ 0.51   | 1.54 $\pm$ 0.59  | 3.22 $\pm$ 0.43   |
| Snowshoe hares/km                 | 4.78 $\pm$ 1.14  | 6.54 $\pm$ 0.99   | 12.66 $\pm$ 9.45 | 5.73 $\pm$ 1.24   |
| Ungulates/km                      | 1.65 $\pm$ 0.85  | 2.26 $\pm$ 0.87   | 0.15 $\pm$ 0.14  | 0.72 $\pm$ 0.22   |

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regression models can also accommodate repeated measurements nested within clusters; in our case, %Track measurements were nested within individuals whereby the response variable %Track was measured repeatedly for each individual. Accounting for an individual random effect of ‘coyote id’ will account for the nested nature of these repeated measurements within individuals. Because some of the covariates of interest had the potential to be collinear, we calculated a variance inflation factor (i.e., package ‘car,’ procedure ‘vip’ in R version 2.6.0) [18] across covariates prior to model selection [21]. A variance inflation factor  $<5$  indicated a lack of collinearity and ensured the covariates of interest could be simultaneously considered in the same regression. We first estimated a global model testing for additive effects of all of the covariates of interest [22]. We then removed covariates that did not have a significant effect on %Track ( $P>0.1$ ). We repeated the process until each covariate had a significant effect on the response variable %Track ( $P\leq 0.1$ ). Note that because model comparison of mixed models using information criteria such as AIC or BIC are still controversial (e.g., [23]), we decided to conduct model selection based on the significance of the explanatory variable only (i.e., P-values).

## Results

We captured and radio-collared 15 (4 F, 11 M) coyotes from August 2006 through February 2008. One individual was shot shortly after being radio-collared and 1 young coyote dispersed from the study area, leaving 13 individuals (4 F, 9 M) for sampling. We backtracked the 13 adult coyotes 57 times for a total of 265.05 km of actual coyote backtracking during 2 winters, 2006–2007 and 2007–2008. An additional 278.54 km of random tracks ( $n=57$  random tracks) were conducted during the same period. We averaged 4.62 backtrack pairs per animal (range = 3–6,  $SD=1.19$ ); actual backtracks averaged a distance of 4.64 km in length ( $n=57$ , range = 1.56–12.21,  $SD=1.69$ ) with a mean of 34.10 track segments per backtrack (range = 15–61,  $SD=10.10$ ). The random backtracks averaged a distance of 4.88 km in length

( $n=57$ , range 3.14–11.81,  $SD=2.50$ ) with a mean of 25.68 track segments per backtrack ( $n=57$ , range 1–39,  $SD=9.82$ ). Coyotes remained within any given habitat for a mean distance of 0.138 km during actual backtracks (range = 0.001–1.149,  $SD=0.120$ ). During random backtracks, coyotes remained within any given habitat for a mean distance of 0.142 km (range = 0.009–0.533). Actual backtracks were in areas most frequently categorized as medium snowmobile use areas (38.6%; 22 of 57 tracks) followed by low snowmobile use (35.1%; 20 of 57 tracks), and high snowmobile use (26.3%; 15 of 57 tracks). Random backtracks were in areas categorized as medium snowmobile use (38.6%), low snowmobile use (31.6%), and high snowmobile use (29.8%).

Coyotes used snowmobile trails for a portion of their track on all actual backtracks conducted (57 of 57 backtracks). For all actual backtracks combined, coyotes used snowmobile trails an average of 35% (range = 0.02 – 86.68,  $SD=23.02$ ) of their travel distance. When traveling on trails, they traveled a mean continuous distance of 149 m per occurrence (range = 0.1–352,  $SD=0.90$ ; Table 1), with a mean overall distance of 1.5 km spent on snowmobile trails per backtrack. Coyotes traveled on snowmobile trails during actual backtracks an average of 11.88 times per backtrack (range = 1–33,  $SD=6.28$ ; Table 1). This was more than twice as often as during the random tracks (mean use of trails was 5.32 times on random tracks), and 3 times higher for the distance traveled on a trail than corresponding random tracks (mean continuous distance traveled on compacted snow per occurrence was 59 m on random tracks). Coyotes traveled significantly closer to snowmobile trails than random expectation ( $t=13.67$ ,  $df=56$ ,  $P<0.001$ ), and selected shallower snow when traveling off trails ( $t=-3.909$ ,  $df=56$ ,  $P<0.001$ ).

When averaged by track, coyotes crossed more predator tracks on actual tracks than on random tracks (actual: mean = 5.82/km [range = 0–34.85,  $SD=6.31$ ]; random: mean = 3.09/km [range = 0–22.6,  $SD=3.82$ ];  $t=6.552$ ,  $df=56$ ,  $P<0.001$ ). Although more tracks of prey were encountered on actual backtracks than on random tracks (actual: 11.27/km, range = 0–54.75,



SD = 11.60; random: 9.96/km, range = 0–67.49, SD = 12.13), this effect was not significant ( $P > 0.30$ ) when analyzed by track. Wolf tracks were crossed at similar rates ( $P > 0.40$ ) on both actual (mean = 0.35/km, range = 0–7.69, SD = 1.26) and random tracks (mean = 0.37/km, range = 0–9.36, SD = 1.52). Snowshoe hares (SSH) were the predominant prey track crossed on both actual and random tracks, with encounter rates as high as 24.26 SSH/km on actual tracks (mean = 5.83, range = 0–24.26, SD = 6.42) and 56.94 SSH/km on random tracks (mean = 5.77, range = 0–56.94, SD = 9.85) but was not significantly different ( $P > 0.20$ ) between actual and random tracks. Grouse were encountered more on actual tracks than on random tracks ( $t = 0.063$ ,  $df = 56$ ,  $P = 0.063$ ).

We observed an inverse relationship between the overall percent that coyotes used snowmobile trails and snow penetration when plotted by month (Figure 2). When we compared the effects of snow condition (snow depth on trail and off trail, as well as snow penetration on trail and off trail; 4 variables total) on the percentage of snowmobile trails used by coyotes by day, the relationship was significant. However, only 20.3% of the variation in use of snowmobile trails was explained by both snow depth and snow penetration ( $F = 3.31$ ,  $df = 2$ ,  $P = 0.017$ ; see also Table 2). Regardless, coyotes increased their use of snowmobile trails as snow penetration off the snowmobile trails increased (became less supportive) and as snow depth increased (Figure 2), and as snow penetration on the snowmobile trails decreased (became more supportive). Additionally, coyotes increased their use of snowmobile trails as snow depth both on and off snowmobile trails increased.

When comparing ratios between the mean distances of the shortest possible travel route and the actual travel route chosen by coyotes where ungulate kills were present, we found a significant difference in the amount of use on snowmobile trails ( $P < 0.0001$ ). The distance ratio was significantly higher in cases where there was an ungulate carcass (mean = 5.25, range = 3.62 – 6.25), compared to a situation where there was no ungulate carcass (mean = 3.08, range = 2.54 – 4.25), suggesting preferential use of snowmobile trails by coyotes to access ungulate carcasses. Coyotes preferred to meander along a snowmobile trail leading to a carcass rather than travel a more direct, but off trail, route of travel.

All variables were significant, with the exception of the mean level of snowmobile use and wolf track encounter rate, between random and actual tracks (Table 3). These non-significant results suggested first that snowmobile use did not explain coyote backtracks more than random expectation; it also suggested that the presence of wolves did not explain coyote track use more than randomly expected. Snow depth and snow penetration variables on the other hand indicated coyotes preferentially used shallower tracks where snow penetration and snow depth were lower than random expectation (Table 3). Coyotes preferentially used tracks where red squirrel track encounters were higher than random expectation, but where rodent and snowshoe hare track encounters were lower than randomly expected (Table 3).

Because all variance inflation factors were  $< 5$ , all variables used in the beta regression mixed models did not show any collinearity issues [21]. Beta regression models indicated coyotes were exploiting snow-compacted routes, with their use directly related to the amount of snow compaction available. The best performing model retained an effect of snowmobile use (i.e., low, medium, or high) whereby snowmobile use had a progressive negative effect on %Track (Table 4; high use:  $\beta = -0.0421$ ;  $P = 0.8544$ ; medium use:  $\beta = -0.8988$ ;  $P < 0.001$ ; low use:  $\beta = -1.1308$ ;  $P < 0.001$ ). However, only lower ( $P < 0.001$ ) and medium ( $P < 0.001$ ) levels had a significant negative effect on %Track (Table 4). The best performing model also retained an effect of rodent track crossings

on snowmobile trails on the time spent by coyotes on snowmobile tracks ‘%Track’ (Table 4). The abundance of rodent tracks encountered on the snowmobile trails positively and significantly influenced the percentage of time a coyote spent on snowmobile trails ( $\beta = 0.1411$ ;  $P = 0.0407$ ).

## Discussion

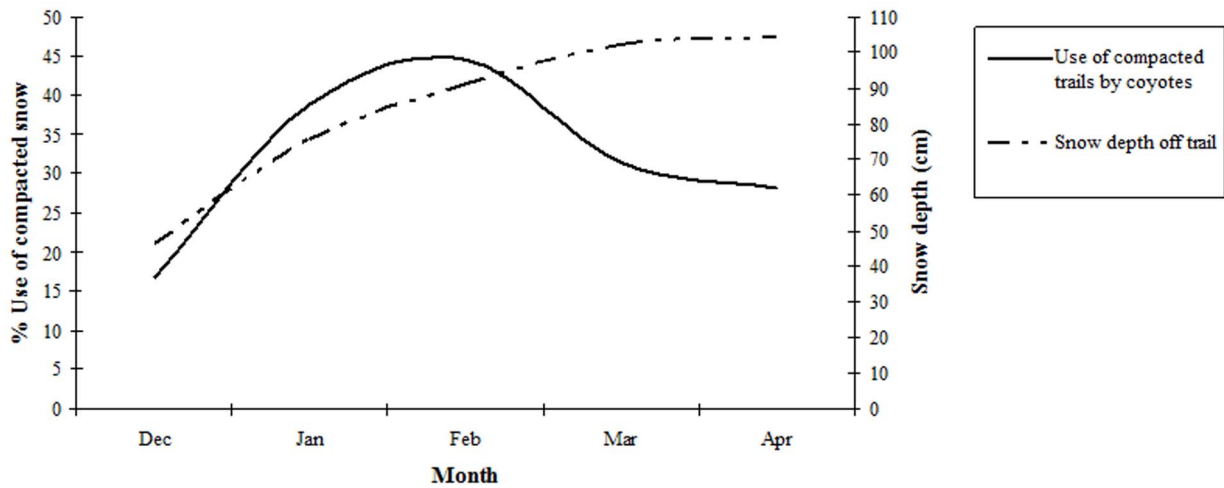
Our findings showed that coyote use of snowmobile trails was associated with presence of a food source (i.e., an ungulate carcass) demonstrating their ability to preferentially use trails to facilitate access, and coyote use of snowmobile trails was related to the availability of trails. Overall, coyote use of snowmobile trails was related to both snow compaction and snow depth; as snow depth and penetrability off trails increased, coyote use of snowmobile trails increased (Figure 2). Essentially, the snow column characteristics were most influential on how much time coyotes spent on snowmobile trails. In the early months of winter, snow depth was low, yet the snow column remained dry and the coyotes easily traveled through the study area. As winter progressed and snow depth increased and snow penetrability (i.e., opposite of supportiveness) increased, coyotes spent more travel distance on snowmobile trails. As spring approached, the snow depth remained high but penetrability decreased (i.e., became more supportive) and hence the coyotes traveled less on snowmobile trails because the snow column off trail was more supportive.

We documented coyote use of snowmobile trails on every backtrack, suggesting that even though coyotes are only using snowmobile trails an average of 34.5% of their overall track distance, there was a strong association between coyotes and snowmobile trails in our study area. Analysis of percent coyote use of snowmobile trails and snow depth by month, showed coyotes preferentially used trails during core winter months (January through March; Figure 2). Use of trails was less during December and April, when temperatures were higher, and the snow was wetter and more compacted due to melting and freezing cycles. During these months, conditions were more similar to those typical of many areas where lynx and coyotes coexist [4]. Based on results from Kolbe [4], they were not able to conclude that “compacted snowmobile trails facilitated coyote movements” in their study area. We suggest snow conditions in northwestern Wyoming are much drier and less supportive than those documented in western Montana. Unlike Kolbe’s findings, there were several instances when coyotes used snowmobile trails almost exclusively over the course of a 3 km backtrack (Figure 3).

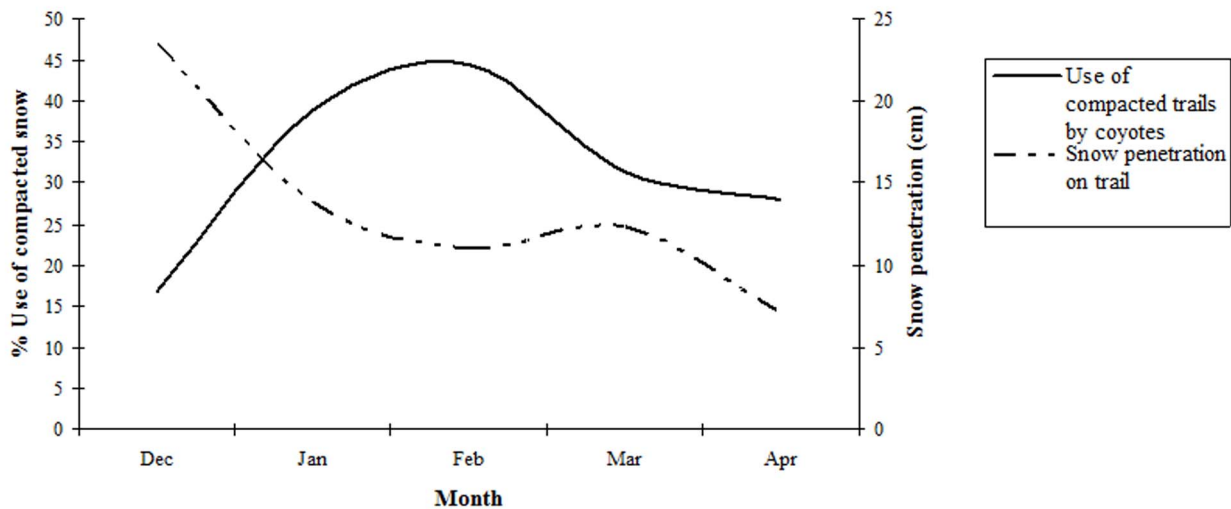
Extensive use of compacted trails was not the only finding contradictory to those of Kolbe [4]. In addition to coyotes using snowmobile trails more than expected, we also found the mean distance coyotes traveled away from snowmobile trails was shorter on actual versus random tracks. While Kolbe [4] suggested coyotes can behaviorally adapt by selecting shallower and more supportive snow to travel, hunt, and utilize resources, rather than rely on snowmobile compacted surfaces, we suggest the level of behavioral adaptation needed to persist in such habitats is dictated by the snow characteristics in the area. Therefore, adaptations, behaviors and use of compacted surfaces will differ based on geographical location and ultimately, characteristics of the snow column.

Coyotes crossed more prey (ungulates and squirrels) tracks and fewer predator tracks during actual backtracks while traveling on compacted snow than on random backtracks. Ungulates and red squirrels were the only prey species showing a higher than expected track crossing rate on actual compacted versus random compacted coyote backtracks, suggesting selection of snowmobile trails may be associated with those species rather than with other

(A)



(B)



**Figure 2. Percent use of snowmobile trails by coyotes in relation to (A) snow depth off the snowmobile trail, and (B) snow penetrability on the snowmobile trail, for each winter month, December 2007 through April 2008, northwestern Wyoming.**  
doi:10.1371/journal.pone.0082862.g002

prey. Based on winter diet analyses [24], coyotes may be selecting travel paths based on ungulate presence. Although coyote predation on ungulates has been reported [25–26], killing of ungulates by coyotes is considered risky due to the possibility of injury and low success rates [25–27]. Therefore, the associations between coyote travel paths and ungulate presence was not likely due to direct killing by coyotes, rather this association could be exploiting kills made by other predators; evidence indicated most ungulate carcasses encountered were wolf kills scavenged by coyotes. Scavenging of wolf kills can be advantageous to coyotes, provided they can exploit the kill while minimizing costs of gaining access and managing the risk posed by wolves [28].

During several backtracks, coyotes used snowmobile trails to travel from one forested cluster to another where snow was shallower under trees and behaviors such as chasing, digging or hunting rodents occurred. This could possibly provide an explanation for the association between coyote travel paths and red squirrel encounters. The association with red squirrel track crossings on actual compacted coyote backtracks could be explained if coyotes were selecting areas having a high occurrence of red squirrels because of their association with squirrel middens. When backtracking coyotes, we found several instances where coyotes were digging in squirrel middens, and diet analyses [24]

**Table 2.** Linear regression analysis testing for the effects of snow depth on snowmobile trails, snow penetration on snowmobile trails, snow depth off snowmobile trails, and snow penetration off snowmobile trails on the percent distance coyotes use a snowmobile trail.

| Variables                    | $\beta$<br>estimates | Std. error | t-<br>statistic | P     |
|------------------------------|----------------------|------------|-----------------|-------|
| Snow depth (on trail)        | 0.396                | 0.124      | 3.197           | 0.002 |
| Snow penetration (on trail)  | -1.357               | 0.492      | -2.758          | 0.008 |
| Snow depth (off trail)       | -0.405               | 0.169      | -2.393          | 0.020 |
| Snow penetration (off trail) | 0.831                | 0.413      | 2.011           | 0.050 |

This analysis utilized all actual tracks (total distance = 265 km) surveyed in the Togwotee Pass study area, northwestern Wyoming, 2007–2008.  
doi:10.1371/journal.pone.0082862.t002

showed coyotes were not targeting red squirrels themselves, but raiding middens (i.e., caches of pine nuts).

Coyotes may be more adaptable and tolerant of disturbance caused by snowmobiles than other predators. Snowmobile trails are used frequently by people and constantly managed for daily use which may be a deterrent to less tolerant wildlife species. Coyotes, however, may adapt to these human-modified areas and use them to their advantage for traveling, hunting, and accessing desirable habitat patches. Another plausible explanation for the high use of managed snowmobile trails by coyotes is the association of movement patterns and the use of roads because of its structure. Coyotes in Seeley Lake, Montana, may have selected for road structure and location rather than the snow conditions on them [4]. While road structure [4] is a plausible explanation in regions where snow conditions result in more supportive or unaltered travel conditions, it was not a likely explanation for our study area because coyote travel patterns changed based on snow conditions (depth and supportiveness; Figure 2), and coyotes in our area traveled closer to snowmobile trails than random expectation. We believe this behavior was a direct result of facilitated travel on compacted surfaces, several of which coincidentally were managed for winter recreation.

Energetic trade-offs become important in winter when harsh conditions carry high energetic costs and survival requires a balance of nutritional intake with energy expenditure. Predators must either change their behavioral patterns to utilize resources in deep snow habitats, or shift their range to an area where food is

**Table 4.** Results pertaining to the best performing beta regression mixed models for the effects of various covariates of interest (e.g., snowmobile use, rodent track encounters) on the amount of time coyotes spend on snowmobile trails (i.e., %Track), northwestern, Wyoming, 2007–2008.

| Explanatory variables       | $\beta$  | SE     | z-test  | P      |
|-----------------------------|----------|--------|---------|--------|
| Snowmobile use (low)        | -1.13080 | 0.2146 | -5.2696 | <0.001 |
| Snowmobile use (medium)     | -0.89880 | 0.2000 | -4.4947 | <0.001 |
| Snowmobile use (high)       | -0.04210 | 0.2297 | -0.1835 | 0.8544 |
| Rodent encounters/on tracks | 0.1411   | 0.0690 | 2.0462  | 0.0407 |

doi:10.1371/journal.pone.0082862.t004

more accessible and acquisition of resources less energetically expensive. While coyotes have been shown to shift territory use to lower elevations during the winter [29], this was not documented in our study. Instead, our findings were similar to another study [4] which documented little change in the mean elevation of coyote backtracks during winter. Based on year-round monitoring of individuals using telemetry, we were able to determine that coyotes resided in their home ranges throughout the year and did not demonstrate seasonal shifts due to deep snow.

Our study provided insight on the relationships between snowmobile trails and their influence on coyote movements in the southern periphery of lynx range. While direct impacts of snowmobiles on lynx were not documented, the potential impacts of a main competitor, the coyote, are worth mentioning. Due to their use of snowmobile trails, coyotes have the potential to access areas of habitat that might normally be too energetically difficult to access in deep snow. Lynx, with their superior body mass to foot load, can access habitats containing deep snow that coyotes might typically avoid. In addition, expansion of current winter recreation use areas may create persistent travel corridors that could be utilized by coyotes. Since coyote use of snowmobile trails was related to how much was available, coyote movements could possibly be altered by limiting snow compaction. Bunnell [3] suggested the use of snowmobiles may result in consistent compacted trails within lynx conservation areas which may be detrimental to local lynx populations in the Intermountain West. Furthermore, they suggested minimizing or rotating compaction areas (thereby limiting potential impacts by coyotes) as a strategy for management agencies concerned with protecting habitats

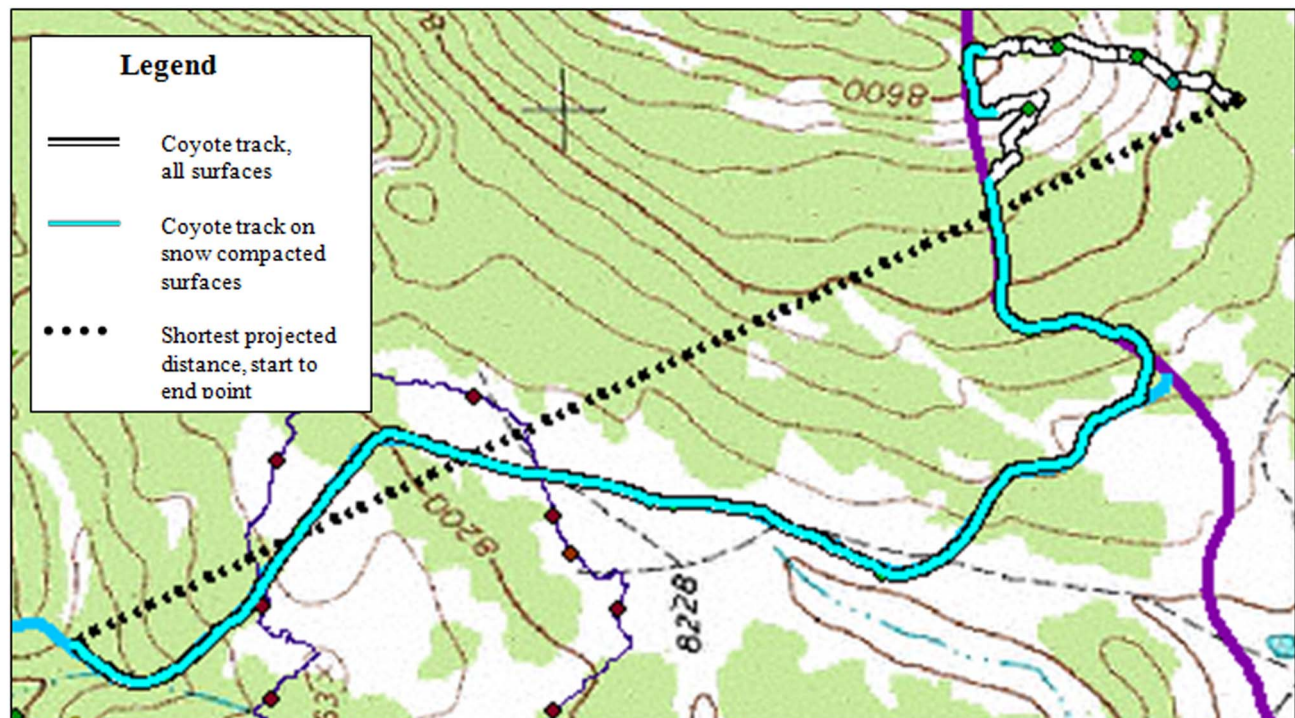
**Table 3.** Multi-Response Permutation Procedure (MRPP) testing for differences in variable means ( $\pm$ SE) between actual tracks (265 km) and random tracks (279 km) in northwestern Wyoming, 2007–2008.

| Variables                                    | Actual track        | Random track        | P      |
|----------------------------------------------|---------------------|---------------------|--------|
| Snowmobile use <sup>a</sup> Recreational use | 20(L)/ 22(M)/ 15(H) | 14(L)/ 27(M)/ 16(H) | 0.801  |
| Snow depth (cm)                              | 85.02 $\pm$ 3.36    | 99.26 $\pm$ 3.94    | 0.005  |
| Snow penetration(cm) (cm)                    | 15.59 $\pm$ 0.82    | 17.23 $\pm$ 0.91    | <0.001 |
| Rodents/km                                   | 0.47 $\pm$ 0.14     | 0.57 $\pm$ 0.15     | 0.004  |
| Red squirrels/km                             | 2.85 $\pm$ 0.42     | 2.68 $\pm$ 0.36     | <0.001 |
| Snowshoe hares/km                            | 5.66 $\pm$ 0.75     | 10.37 $\pm$ 5.04    | 0.012  |
| Ungulates/km                                 | 1.96 $\pm$ 0.60     | 0.49 $\pm$ 0.14     | 0.077  |
| Wolves/per km                                | 0.36 $\pm$ 0.21     | 0.17 $\pm$ 0.12     | 0.379  |

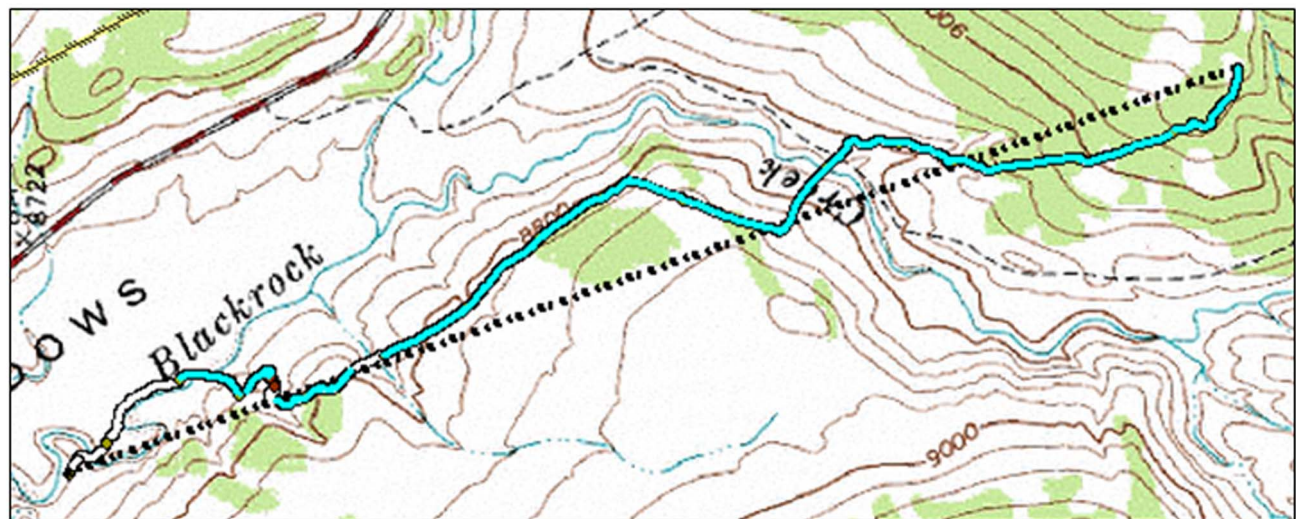
<sup>a</sup>Snowmobile use: L = low, M = medium, H = high.

doi:10.1371/journal.pone.0082862.t003

(A)



(B)



**Figure 3. Examples of coyote travel paths in the presence of snowmobile trails: (A) Male coyote 05 on 4 January 2008, and (B) Male coyote 15 on 3 April 2008, northwestern Wyoming, 2007–2008.**  
doi:10.1371/journal.pone.0082862.g003

needed to sustain lynx and their prey. Our findings support this management strategy, but further research should be conducted to determine whether the suggestion of Bunnell [3] is practical and could be implemented successfully in areas where lynx conservation is a concern.

### Acknowledgments

We thank P. Dowd, S. Dempsey, M. Greenblatt, S. Hegg, M. Holmes, M. Linnell, S. McKay, and G. Worley-Hood for field assistance; and J. Bissonette, C. Mitchell, and J. Squires for reviews of the manuscript.



## Author Contributions

Conceived and designed the experiments: JLBD EMG. Performed the experiments: JLBD EMG. Analyzed the data: JLBD EMG LMA.

Contributed reagents/materials/analysis tools: JLBD EMG LMA. Wrote the paper: JLBD EMG LMA.

## References

1. US Department of the Interior (2000) Endangered and threatened wildlife and plants; determination of threatened status for the contiguous United States distinct population segment of the Canada lynx. *Federal Register* 65: 16052–16086.
2. US Department of Agriculture (2007) Northern Rockies lynx management direction record of decision; National forests in Montana, and parts of Idaho, Wyoming, and Utah. US Forest Service, Washington DC.
3. Bunnell KD, Flinders JT, Wolfe ML (2006) Potential impacts of coyotes and snowmobiles on lynx conservation in the intermountain west. *Wildl Soc Bull* 34: 828–838.
4. Kolbe JA, Squires JR, Pletscher DH, Ruggiero LF (2007) The effect of snowmobile trails on coyote movements within lynx home ranges. *J Wildl Manag* 71: 1409–1418.
5. Murray DL, Boutin S (1991) The influence of snow on lynx and coyote movements: does morphology affect behavior? *Oecologia* 88: 463–469.
6. Crete M, Lariviere S (2003) Estimating the costs of locomotion in snow for coyotes. *Can J Zool* 81: 1808–1814.
7. Buskirk SW, Ruggiero LF, Krebs CJ (2000) Habitat fragmentation and interspecific competition: implications for lynx conservation. In: Ruggiero LF, Aubry KB, Buskirk SW, Koehler GM, Krebs CJ, et al, editors. *Ecology and conservation of lynx in the United States*. Boulder: University Press of Colorado. pp. 83–100.
8. Ruediger B, Claar J, Gniadek S, Holt B, Lewis L, et al (2000) Canada lynx conservation assessment and strategy. US Forest Service, US Fish and Wildlife Service, US Bureau of Land Management, US National Park Service, Missoula, Montana.
9. Ruggiero LF, Aubry KB, Buskirk SW, Koehler GM, Krebs CJ, et al (2000) Ecology and conservation of lynx in the United States. Boulder: University Press of Colorado.
10. Aubry KB, Koehler GM, Squires JR (2000) Ecology of Canada lynx in southern boreal forests. In: Ruggiero LF, Aubry KB, Buskirk SW, Koehler GM, Krebs CJ, et al, editors. *Ecology and conservation of lynx in the United States*. Boulder: University Press of Colorado. pp. 373–396.
11. McKelvey KS, Ortega YK, Koehler GM, Aubry KB, Brittell JB (2000) Canada lynx habitat and topographic use patterns in north central Washington: a reanalysis. In: Ruggiero LF, Aubry KB, Buskirk SW, Koehler GM, Krebs CJ, et al, editors. *Ecology and conservation of lynx in the United States*. Boulder: University Press of Colorado. pp. 307–336.
12. Murray DL, Boutin S, O'Donoghue M, Nams VO (1995) Hunting behavior of a sympatric felid and canid in relation to vegetative cover. *Anim Behav* 50: 1203–1210.
13. Natural Resources Conservation Service (2008) SNOTEL data network. Available: <http://www.wcc.nrcs.usda.gov/snotel/snotel.pl?sitenum=822&state=wy>. Accessed 2008 Dec 29.
14. Wyoming Department of State Parks and Cultural Services (2008) Wyoming State Government Annual Report. Cheyenne: State Library Division Publications and Marketing.
15. Gese EM, Rongstad OJ, Mytton WR (1987) Manual and netgun capture of coyotes from helicopters. *Wildl Soc Bull* 15: 444–445.
16. DeCesare NJ, Squires JR, Kolbe JA (2005) Effect of forest canopy on GPS-based movement data. *Wildl Soc Bull* 33: 935–941.
17. Mielke PW, Berry KJ (2001) Permutation methods: a distance function approach. New York: Springer Series in Statistics.
18. R Development Core Team (2008) R: a language and environment for statistical computing, version 2.6.2. Vienna: R Foundation for Statistical Computing.
19. Stevens MHH, Oksanen J (2009) Multi-response permutation procedure of within- versus among-group dissimilarities ('mrpp' procedure) in R version 2.6.2., library 'vegan'. Vienna: R Foundation for Statistical Computing.
20. Ferrari SLP, Cribari-Neto F (2004) Beta regression for modeling rates and proportions. *J Appl Stat* 31: 799–815.
21. Neter J, Kutner MH, Nachtsheim CJ, Wasserman W (1996) Applied linear statistical models. Chicago: Irwin.
22. Burnham KP, Anderson DR (2002) Modeling selection and multimodel inference: a practical information-theoretic approach, 2<sup>nd</sup> ed. New York: Springer.
23. Spiegelhalter DJ, Best NG, Carlin BP, Van Der Linde A (2002) Bayesian measures of model complexity and fit. *J Royal Stat Soc B* 64: 583–639.
24. Dowd JLB, Gese EM (2012) Seasonal variation of coyote diet in northwestern Wyoming: implications for dietary overlap with Canada lynx? *Northwest Sci* 86: 289–299.
25. Gese EM, Grothe S (1995) Analysis of coyote predation on deer and elk during winter in Yellowstone National Park, Wyoming. *Amer Midl Nat* 133:36–43.
26. Lingle S (2000) Seasonal variation in coyote feeding behaviour and mortality of white-tailed and mule deer. *Can J Zool* 78:85–99.
27. Paquet PC (1992) Prey use strategies of sympatric wolves and coyotes in Riding Mountain National Park, Manitoba. *J Mammal* 73: 337–343.
28. Atwood TC, Gese EM (2007) Coyotes and recolonizing wolves: social rank mediates risk-conditional behavior at ungulate carcasses. *Anim Behav* 75: 753–762.
29. Koehler GM, Hornocker MG (1991) Seasonal resource use among mountain lions, bobcats, and coyotes. *J Mammal* 72: 391–396.

**From:** Delphey, Phil  
**To:** [Belleman, Ann](#)  
**Subject:** Re: PolyMet exposure/response info and organization  
**Date:** Wednesday, December 16, 2015 12:21:56 PM  
**Attachments:** [Biological Opinion.pdf](#)

---

Mittal Steel BO.

Phil

On Mon, Dec 14, 2015 at 9:36 AM, Belleman, Ann <[ann\\_belleman@fws.gov](mailto:ann_belleman@fws.gov)> wrote:

Hi Phil,

I know you're pretty booked up today so when you have a chance, would you take a look at the attached docs and let me know if you agree/disagree with what I've done, gaps, etc.

The table is for lynx and wolf only (because of similar effects). I've tried to distill the BA's information to reduce redundancy in effects analyses discussions and to organize by activity exposure, etc. The other attached page is out of the BA and shows the BA's organization for lynx (lower half of page), which is similar for all 3 species, and is by effect rather than by activity.

Thanks - A

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**From:** [McCollough, Mark](#)  
**To:** [Jim Zelenak](#)  
**Subject:** follow-up on comments on meeting notes  
**Date:** Thursday, December 17, 2015 9:42:39 AM

---

Jim:

Thanks for your call this morning.

After reviewing the comments from Maine experts (Jen and Erin), here are a few questions that you may want to consider adding to our list of follow-up with lynx-hare experts. Below are some of my personal questions that I did not get to ask at the workshop.

Do different climate change emission scenarios result in different predicted comes for spruce-fir? If so, how much variability are these predictions between high and low scenarios?

Some questions from Mark

Is there evidence that the management guidelines in the LCAS are working? That is, is there evidence that lynx are persisting in LAUs where LCAS guidelines are in place? Are lynx expanding into new LAUs where LCAS guidelines have been in place now for 10 or 15 years? Is reproduction and survival adequate in LCAS-managed areas for population growth? This may be an essential research and monitoring need that should be identified in a recovery plan.

What genetic  $F_{st}$  values are considered "significant" from the standpoint of the ESA DPS policy? Are there other genetic measures that are more appropriate for the significance test? Given the pace of recent genetic advances, (i.e. mapping the lynx genome) might we look at genetic variability in the N. American lynx population in a different way 5 to 10 years from now?

Is there sufficient science available to document the degree of range overlap between lynx and bobcat in the 6 populations in the DPS? Some experts indicated there were some places with broad overlap (MT?) and others with narrow overlap (ME, MN)? Do experts believe there is interference (behavioral) or resource competition (food) between the species? Do lynx simply have competitive advantage in deep snow? If climate change diminishes snow depth, shortens snow duration, or affects snow quality (e.g. density, crusting condition), do experts believe sympatric populations of lynx and bobcat can coexist? This may be an essential research and monitoring need that should be identified in a recovery plan.

What are the predictions of climate change effects on reducing spruce and fir throughout the DPS? Do experts anticipate a time lag (i.e. it will take time for trees to die, or simply stop reproducing, or after spruce and fir are cut/destroyed by fire or insect the new climate envelope will support regeneration by other species)?

How much fluctuation in hare populations has been documented in the 6 DPS population areas in recent decades and are past levels of fluctuation anticipated in the future? Are past and future fluctuations of a magnitude to affect lynx demographics/populations?

Currently, lynx occupy sparsely populated and developed landscapes. Is this a requirement?

What types and level of development are likely to diminish or preclude lynx occupancy of otherwise suitable habitat? What levels and types of human activity are likely to occur in each of the 6 units in the foreseeable future?

--

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**From:** [McCollough, Mark](#)  
**To:** [Jim Zelenak](#)  
**Subject:** follow-up on comments on meeting notes  
**Date:** Thursday, December 17, 2015 11:42:37 AM

---

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--

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**From:** [Zelenak, Jim](#)  
**To:** [Kurt Broderdorp](#)  
**Subject:** Re: Colorado/S. Rockies habitat ownership  
**Date:** Thursday, December 17, 2015 1:30:27 PM

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I don't think ownership per se is important, but rather conservation status - how much of lynx habitat (and do we try to distinguish actual lynx habitat from all the millions of acres of mapped "potential" habitat? Or do we just use what CPW has mapped as "high-use"?... Or maybe only those areas where monitoring shows they still occur?... ) is managed in accordance with which conservation measures?

So - all the national forests are managed in accordance with Southern Rockies Mgmt. Direction, yes?

BLM lynx habitats (if any) are managed according to what? Old LCAS? Previous conservation agreements?

State lynx habitats - what guides mgmt. there? Parks vs. other State lands - any differences in how managed for lynx?

It would be good to know how much is in private ownership and whether any privately-owned chunks are managed with any lynx conservation measures.

On Thu, Dec 17, 2015 at 1:20 PM, Kurt Broderdorp <[Kurt\\_Broderdorp@fws.gov](mailto:Kurt_Broderdorp@fws.gov)> wrote:

Jim, I am wondering how important the lynx habitat ownership breakdown is. What would we use the information for in the SSA context? Would it be sufficient to include the acres of habitat in non-federal ownership?

Kurt Broderdorp

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**From:** [Jackson, Scott -FS](#)  
**To:** [Johnston, Eric -FS](#); [Harvey, Gary -FS](#); [Kuennen, Reed -FS](#); [Treichsel, Heidi -FS](#); [Squires, John -FS](#); [Katrina\\_Dixon@fws.gov](mailto:Katrina_Dixon@fws.gov); [Jim\\_Zelenak](mailto:Jim_Zelenak); [megan\\_kosterman@fws.gov](mailto:megan_kosterman@fws.gov)  
**Subject:** lynx/habitat relationships  
**Start:** Thursday, January 21, 2016 10:00:00 AM  
**End:** Thursday, January 21, 2016 3:00:00 PM  
**Location:** USFS Northern Regional Office, Missoula, MT Yellowstone Conf. Rm.

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Thank you for responding to this doodle poll. Thanks to some folks' willingness to be flexible, it looks like January 21st 10 AM – 3 PM (Mtn. Time) will work for everyone. We'll plan on meeting at FS RO in Missoula in the Yellowstone Conference Room. I hope to have a good discussion of new information related to lynx habitat and its relationship with current management direction. I will send out more information as the date approaches.

Thanks again for your participation in what I believe is an important and relevant topic to all of us. If you have questions or want to discuss something ahead of time, please let me know.

I hope you are all doing well and that you have a great holiday season!

Scott

**From:** [Smith, Tamara](#)  
**To:** [Delphey, Phil](#)  
**Cc:** [Lisa Mandell](#); [Kelly Nail](#); [Jennifer Szymanski](#); [Laura Ragan](#)  
**Subject:** Re: SSAs with relevance to WI  
**Date:** Thursday, December 17, 2015 4:09:47 PM

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If you think it will be similar to the conversation you had with Rich Baker earlier this week, it is probably not necessary for me to be on the call since you have all the info. now - here are some brief updates:

- We will be sending out letters to the FOs/States regarding the RPBB SSA later this week or early next week - Owen will get that email.
- A similar mussel data request was sent to WIDNR (Lisie Kitchell/Dave Heath) - same as the MN request.
- Lynx SSA has monthly state coordination calls - I believe Owen is one of the WI contacts that are notified of those calls but I can double check that.

Thanks,  
Tam

On Thu, Dec 17, 2015 at 3:20 PM, Delphey, Phil <[phil\\_delphey@fws.gov](mailto:phil_delphey@fws.gov)> wrote:

I thought that I'd give Owen a call to give him a heads-up on the SSAs that are underway and that have some relevance to WI.

Those include the following:

Eastern massasauga  
Snuffbox  
Sheepnose  
spectaclecase  
Rusty-patched bumble bee  
Prairie bush clover  
Lynx

I could give him a call myself, but would also welcome any of you if you'd like to join me on this call.

I'll wait to hear from each of you before I try to schedule anything.

Phil

--

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**From:** Belleman, Ann  
**To:** [Andrew Horton](#)  
**Subject:** PM's draft BO w/consult history - attached  
**Date:** Monday, December 21, 2015 9:08:05 AM  
**Attachments:** [PolyMet versionDraft BO\\_Dec2015.docx](#)

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**From:** [Cummings, Jonathan](#)  
**To:** [Zelenak, Jim](#)  
**Cc:** [Parkin, Mary](#); [Heather Bell](#); [Seth Willey](#)  
**Subject:** Re: won't be able to make the lynx call today ...  
**Date:** Monday, December 21, 2015 11:02:54 AM

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Works for me, talk to you tomorrow.  
Jonathan

On Mon, Dec 21, 2015 at 12:41 PM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

Heather also indicated on last call that she would not be able to make today's scheduled call, and Seth is also on leave.

That leaves me and Jonathan, and because I, too, am trying to fill in some gaps in the workshop report and need to get to the notes as well, I suggest we skip the call today and catch up tomorrow on the the Core Team call.

Jonathan, let me know if you have other thoughts or anything we need to to discuss.

Thanks,

Jim

On Mon, Dec 21, 2015 at 10:36 AM, Parkin, Mary <[mary\\_parkin@fws.gov](mailto:mary_parkin@fws.gov)> wrote:

Hi all,

Although I intend to keep working on the workshop report, I'm actually on AL and in a hotel in Las Vegas (no gambling! came here to pick up our daughter at the airport), and my family's waiting for me to start the drive home. As penance for not doing my part last week, I'll set aside time over the next few days for the report, and I'll be on tomorrow's call.

I'll continue to work on the elicitation process section for the next 20 min or so.

Happy holidays!

Mary

--

*Mary Parkin*  
*Endangered Species Recovery Coordinator, Northeast Region*  
*U.S. Fish and Wildlife Service, Hadley, MA*  
*Remotely located in Escalante, Utah:*  
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*Street address 145 North Center St, Escalante, UT 84726*  
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Jonathan W. Cummings, PhD  
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<https://profile.usgs.gov/jwcummings>

Remote Contact Info:

Ph: 802-999-8684  
243 Locust St  
Dover, NH 03820

## Current Distribution, Status, and Threats of Canada Lynx in Montana and Wyoming



John Squires, Rocky Mountain Research Station, Missoula, MT



### Basis of Assessment - Montana:

- a) Lynx Research Program at RMRS initiated in 1998
- b) Captured and collared 175 individuals
- c) Recorded 169,782 GPS and 3043 VHF locations that document lynx movements and resource-use
- d) Investigated the following topics regarding lynx in Montana:

## Basis of Assessment:

- Resource selection

Squires, J. R., N. J. DeCesare, J. A. Kolbe, and L. F. Ruggiero. 2008. Hierarchical den selection of Canada lynx in western Montana. *Journal of Wildlife Management* 72:1497-1506.

Squires, J. R., N. J. DeCesare, J. A. Kolbe, and L. F. Ruggiero. 2010. Seasonal Resource Selection of Canada Lynx in Managed Forests of the Northern Rocky Mountains. *Journal of Wildlife Management* 74:1648-1660.

- Prey Selection

Squires, J. R. and L. F. Ruggiero. 2007. Winter prey selection of Canada lynx in northwestern Montana. *Journal of Wildlife Management* 71:310-315.

- Competition

Kolbe, J. A., J. R. Squires, D. H. Pletscher, and R. F. Ruggiero. 2007. The effect of snowmobile trails on coyote movements within lynx home ranges. *Journal of Wildlife Management* 71:1409-1418.

• 4

## Basis of Assessment:

- Activity Patterns

Kolbe, J. A. and J. R. Squires. 2007. Circadian activity patterns of Canada lynx in western Montana. *Journal of Wildlife Management* 71:1607-1611.

Olson, L. E., J. R. Squires, N. J. DeCesare, J. A. Kolbe. 2011. Den use and activity patterns in female Canada lynx (*Lynx canadensis*) in the Northern Rocky Mountains. *Northwest Science* 85(3):455-462.

- Detection/Monitoring

Squires, J. R., K. S. McKelvey, L. F. Ruggiero. 2004. A snow-tracking protocol used to delineate local lynx, *Lynx canadensis*, distributions. *Canadian Field-Naturalist* 118:583-589.

McKelvey, K. S., J. Von Kienast, K. B. Aubry, G. M. Koehler, B. T. Maletzke, J. R. Squires, E. L. Lindquist, S. Loch, M. K. Schwartz. 2006. DNA analysis of hair and scat collected along snow tracks to document the presence of Canada lynx (*Lynx canadensis*). *Wildlife Society Bulletin* 34:451-455.

Squires, J. R., L. E. Olson, D. L. Turner, N. J. DeCesare, and J. A. Kolbe. 2012. Estimating detection probability for Canada lynx using snow-track surveys in the Northern Rocky Mountains. *Wildlife Biology* 18:215-224.

• 5

## Basis of Assessment:

- Connectivity

Squires, J. R., Nicholas J. DeCesare, Lucretia E. Olson, Jay A. Kolbe, Mark Hebblewhite, and Sean A. Parks. 2013. Combining resource selection and movement behavior to predict corridors of Canada lynx at their southern range periphery. *Biological Conservation* 157:187-195.

• 6

### Basis of Assessment - Wyoming:

- a) Wyoming Game and Fish Department (WGF), in cooperation with the Shoshone National Forest (SNF), initiated lynx surveys during winter 1995/96
  - no lynx detected on SNF
  - Impetus for WGF to fund additional surveys, trapping, and telemetry in the Wyoming Range
- b) During 1997-98, WGF searched approximately 2055 km of maintained snowmobile routes and 2400 km of non-maintained trails for lynx tracks in 12 areas (Laurion and Oakleaf 1998) – 6 lynx tracks detected

• 7

### Basis of Assessment - Wyoming:

- c) During winter 1998-99, three general areas were searched (Laurion and Oakleaf 1999) - 6 tracks located in Wyoming Range.
- d) RMRS, in cooperation with WGD, conducted lynx surveys in 2000, 2001, and 2002
  - 2000 – Wyoming Range: 5 lynx tracks - kitten and female
  - 2001 – Wyoming Range: 5 lynx tracks
  - 2002 – no detections

• 8

### Basis of Assessment - Wyoming:

- e) Yellowstone Park Lynx survey from 2001 – 2004 (1,143 km ski-based snow tracks, 749 km snowmobile-based survey, 693 km aircraft survey, and 35 hair snare transects - 105-175 stations; Murphy et al. 2006. Distribution of Canada Lynx in Yellowstone National Park. Northwest Science 80:199-206)
- f) DNA confirmed detections of 3 lynx – 1 female, 1 female with male kitten, and 1 male. All detections on east side of Yellowstone Park – east shore Yellowstone Lake.

• 9

## Basis of Assessment - Wyoming:

g) Endeavor Wildlife Research Foundation conducted track/DNA surveys between 2004-2005 in southern GYA (Bridger-Teton Nat. Forest including Gros Ventre and Teton Wilderness areas) – searched 4,320 miles and detected (DNA confirmed) 18 lynx tracks. Confirmed presence in Wyoming Range.

h) In 2008-2009, Endeavor Wildlife Research searched 2,854 miles for winter tracks throughout the GYA – documented 6 detections on Togwotee Pass, 2 possible detections in Yellowstone National Park, and 1 possible detection on the Beartooth Plateau.

• 10

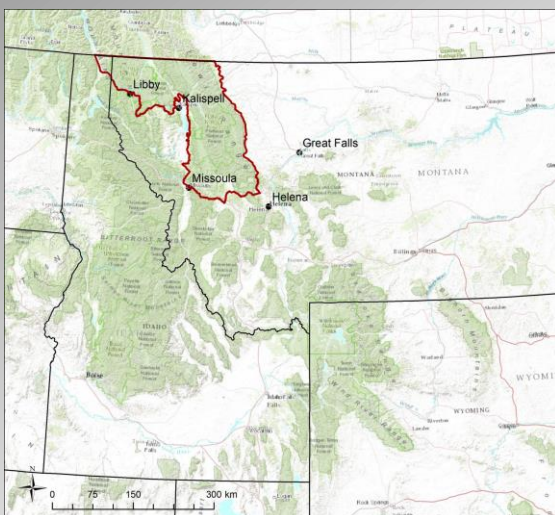
## Basis of Assessment – Wyoming (telemetry):

e) From 2006-2007, WGF collared 2 lynx (one male, 1 female) in Wyoming Range – monitored throughout the year with conventional ground and aerial telemetry (1996 – 2001) – (N=219 locations – male, N = 212 - female)

f) In 2000, female died. WGF asked RMRS to replace the collar on male with ARGOS (N = 258). Documented summer exploratory movements of male (1999 –2001) based on conventional and Argos telemetry (Squires and Oakleaf. 2005. Movements of a male Canada lynx crossing the Greater Yellowstone Area, including highways. Northwest Science 79:196-201).

• 11

## Status - Montana



• 12

## Status - Montana

Litter size of lynx in western Montana, 1999 – 2007

| Year                       | Seeley Lake |           |                  | Purcell Mountains |           |                  | Combined  |            |                  |
|----------------------------|-------------|-----------|------------------|-------------------|-----------|------------------|-----------|------------|------------------|
|                            | Litters     | Kittens   | Kittens / litter | Litters           | Kittens   | Kittens / litter | Litters   | Kittens    | Kittens / litter |
| 1999                       | 2           | 4         | 2.00             |                   |           |                  | 2         | 4          | 2.00             |
| 2000                       | 4           | 6         | 1.50             |                   |           |                  | 4         | 6          | 1.50             |
| 2001                       | 3           | 8         | 2.67             |                   |           |                  | 3         | 8          | 2.67             |
| 2002                       | 3           | 4         | 1.33             |                   |           |                  | 3         | 4          | 1.33             |
| 2003                       | 5           | 14        | 2.80             |                   |           |                  | 5         | 14         | 2.80             |
| 2004                       | 5           | 15        | 3.00             | 5                 | 16        | 3.20             | 10        | 31         | 3.10             |
| 2005                       | 5           | 12        | 2.40             | 6                 | 19        | 3.17             | 11        | 31         | 2.82             |
| 2006                       | 3           | 5         | 1.67             | 3                 | 8         | 2.67             | 6         | 13         | 2.17             |
| 2007                       | 3           | 7         | 2.33             | 8                 | 22        | 2.75             | 11        | 29         | 2.64             |
| <b>MLE</b>                 |             |           |                  |                   |           |                  |           |            |                  |
| <b>Mean<sup>1</sup></b>    | <b>33</b>   | <b>75</b> | <b>2.24</b>      | <b>22</b>         | <b>65</b> | <b>2.95</b>      | <b>55</b> | <b>140</b> | <b>2.53</b>      |
| <b>MLE Var<sup>1</sup></b> |             |           | <b>0.002</b>     |                   |           | <b>0.084</b>     |           |            | <b>0.008</b>     |
| <b>95% CI</b>              |             |           | <b>2.21-2.27</b> |                   |           | <b>2.67-3.23</b> |           |            | <b>2.51-2.55</b> |

• 13

## Status - Montana

Proportion of successful adult Canada lynx

| Year                       | Seeley Lake<br>(N=52 breeding-age females) |                   |                  | Purcell Mountains<br>(N=28) |                   |                  | Combined<br>(N=80) |                   |                  |
|----------------------------|--------------------------------------------|-------------------|------------------|-----------------------------|-------------------|------------------|--------------------|-------------------|------------------|
|                            | Females                                    | Females w kittens | Prop             | Females                     | Females w kittens | Prop             | Females            | Females w kittens | Prop             |
| 1999                       | 4                                          | 2                 | 0.50             |                             |                   |                  | 4                  | 2                 | 0.50             |
| 2000                       | 6                                          | 4                 | 0.67             |                             |                   |                  | 6                  | 4                 | 0.67             |
| 2001                       | 9                                          | 3                 | 0.33             |                             |                   |                  | 9                  | 3                 | 0.33             |
| 2002                       | 6                                          | 2                 | 0.33             |                             |                   |                  | 6                  | 2                 | 0.33             |
| 2003                       | 5                                          | 3                 | 0.60             |                             |                   |                  | 5                  | 3                 | 0.60             |
| 2004                       | 6                                          | 4                 | 0.68             | 5                           | 5                 | 1.00             | 11                 | 9                 | 0.82             |
| 2005                       | 6                                          | 5                 | 0.83             | 7                           | 7                 | 1.00             | 13                 | 12                | 0.92             |
| 2006                       | 3                                          | 3                 | 1.00             | 6                           | 4                 | 0.67             | 9                  | 7                 | 0.78             |
| 2007                       | 3                                          | 3                 | 1.00             | 10                          | 7                 | 0.70             | 13                 | 10                | 0.77             |
| <b>MLE<sup>1</sup></b>     |                                            |                   |                  |                             |                   |                  |                    |                   |                  |
| <b>Mean</b>                |                                            |                   | <b>0.61</b>      |                             |                   | <b>0.83</b>      |                    |                   | <b>0.67</b>      |
| <b>MLE Var<sup>1</sup></b> |                                            |                   | <b>0.01</b>      |                             |                   | <b>0.01</b>      |                    |                   | <b>0.02</b>      |
| <b>95% CI</b>              |                                            |                   | <b>0.42-0.81</b> |                             |                   | <b>0.43-0.98</b> |                    |                   | <b>0.45-0.82</b> |

• 14

Model-selection results for 8 *a priori* models of monthly survival rate based on three categorical covariates (age, sex, site), each having two levels.

| Model                  | AICc    | Delta  | AIC Weight | Model Likelihood | Number of Parameters |
|------------------------|---------|--------|------------|------------------|----------------------|
| {S(age + site)}        | 510.261 | 0      | 0.4374     | 1                | 3                    |
| {S (age + sex + site)} | 511.204 | 0.9425 | 0.2731     | 0.6242           | 4                    |
| {S (age)}              | 512.838 | 2.5766 | 0.1206     | 0.2757           | 2                    |
| {S (age+ sex)}         | 513.74  | 3.4792 | 0.0768     | 0.1756           | 3                    |
| {S (site)}             | 515.287 | 5.0255 | 0.0355     | 0.081            | 2                    |
| {S (sex+ site)}        | 515.414 | 5.1528 | 0.0333     | 0.0761           | 3                    |
| {S (.)}                | 517.458 | 7.1965 | 0.0120     | 0.0274           | 1                    |
| {S (sex)}              | 517.556 | 7.2954 | 0.0114     | 0.0261           | 2                    |

We estimated survival based on 125 lynx monitored monthly from 1999-2007 using a staggered entry design; we documented 2376 lynx-use months during this period.

• 15

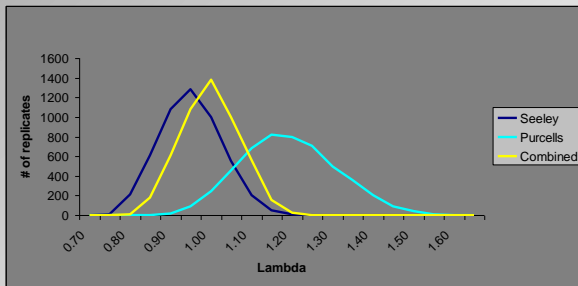
Annual Survival Rate of female lynx on the Seeley Lake(1999-2007) and Purcell (2003-2007) Study Areas including a combined estimate.

|                 |          | Female Subadult Survival <sup>1</sup> | Female Adult Survival <sup>1</sup> |
|-----------------|----------|---------------------------------------|------------------------------------|
| <b>Seeley</b>   | Mean     | <b>0.515</b>                          | <b>0.747</b>                       |
|                 | Variance | 0.014                                 | 0.003                              |
|                 | 95% CI   | 0.283 - 0.746                         | 0.648 - 0.846                      |
| <b>Purcells</b> | Mean     | <b>0.683</b>                          | <b>0.846</b>                       |
|                 | Variance | 0.017                                 | 0.004                              |
|                 | 95% CI   | 0.428 - 0.937                         | 0.721 - 0.970                      |
| <b>Combined</b> | Mean     | <b>0.520</b>                          | <b>0.753</b>                       |
|                 | Variance | 0.010                                 | 0.002                              |
|                 | 95% CI   | 0.322 - 0.718                         | 0.659 - 0.847                      |

• 16

## Status - Montana

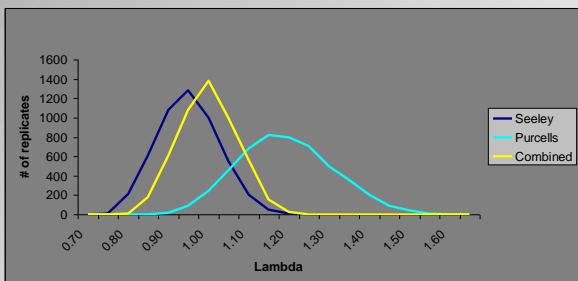
Frequency distribution of  $\lambda$  values from 5000 replicates in which lynx vital rates were chosen from a uniform distribution bounded by their 95% confidence intervals



• 17

## Status - Montana

- Mean  $\lambda$  for Seeley Lake was 0.925 (95 % CI = 0.923 - 0.927) compared to 1.168 (95% CI = 1.165-1.171) in the Purcell Mountains
- Combined  $\lambda$  from both study areas was 0.973 (95% CI = 0.971-0.975)



• 18

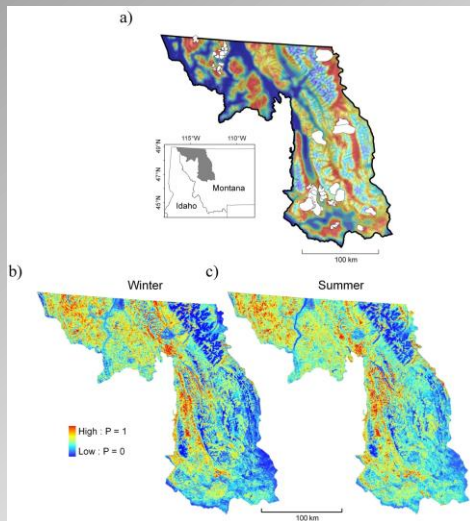


## Status - Montana

- Distribution in Montana remained generally unchanged since the 2000 listing
- Understanding of distribution has been refined with surveys conducted in Salish, Purcell, Seeley-Swan, Garnet and Bitterroot Mountains and northern GYA.

• 19

## Status - Montana



• 20

## Status - Montana

- Garnet Range has supported lynx populations since the 1980s (research documented)
- It appears that lynx recently contracted from the Garnet Range, Montana

• 21



## Status - Montana

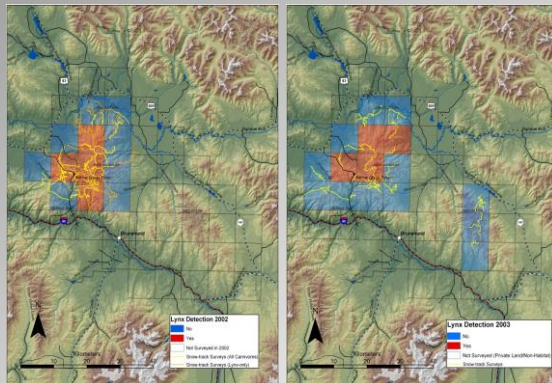
- RMRS surveyed 242 km of roads and trails for all carnivores and an additional 220 km of lynx-only surveys in Garnets in 2002-03.
- Documented lynx ( $n = 37$  detections) in 4 of 12 pixels searched . We detected 115 additional lynx tracks during lynx-only surveys that extended the spatial extent and intensity of our search.

• 22

## Status - Montana

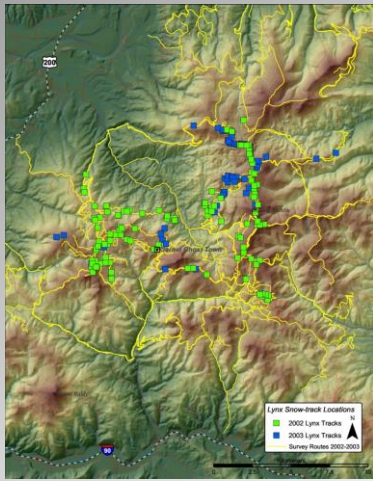
- In 2003, we expanded our effort and detected lynx ( $n = 37$ ) in Garnets in similar areas to those of 2002 in 4 of 16 pixels surveyed .

• 23

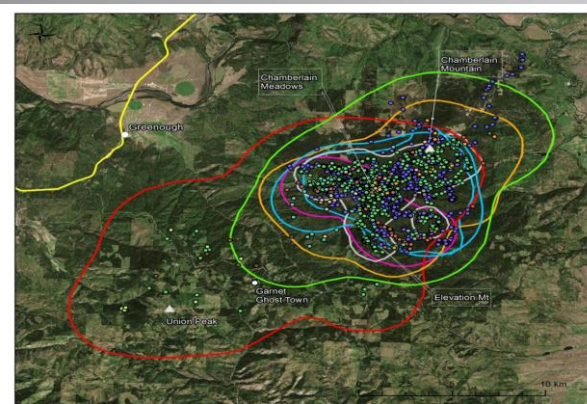


Survey pixels and snow-track survey routes where lynx were detected in the Garnet Range, Montana, 2002 and 2003.

• 24



All lynx tracks documented during snow-track surveys in the Garnet Range, Montana, winters 2002 and 2003.



- |              |              |            |            |           |
|--------------|--------------|------------|------------|-----------|
| • F104, 2003 | • F96, 2002  | <b>VHF</b> | <b>GPS</b> | — Highway |
| • F104, 2004 | • M101, 2003 | ○ 2002     | □ 2005     | ○ Town    |
| • F104, 2005 | • M101, 2004 | ○ 2003     | □ 2006     |           |
| • F90, 2002  | • M120, 2005 | ○ 2004     | □ 2010     |           |
| • F90, 2003  | • M120, 2007 | ○ 2005     |            |           |
| • F90, 2004  | • M82, 2002  |            |            |           |
| • F95, 2002  | • M84, 2002  |            |            |           |
|              | • F104, 2006 |            |            |           |
|              | • M120, 2005 |            |            |           |
|              | • M149, 2010 |            |            |           |

## Status - Montana

- In 2010, RMRS conducted follow-up surveys and trapping in the Garnet Range.
- Captured only 2 males in the Garnets despite an extensive trap effort - 1 individual was a recapture from 2007 and 1 new capture.
- In 2010, lynx restricted spatially in Garnet Range

## Status - Montana

- Recent surveys (winter 2014-2015) that incorporated track surveys and cameras failed to detect lynx in Garnet

• 28

## Status - Montana

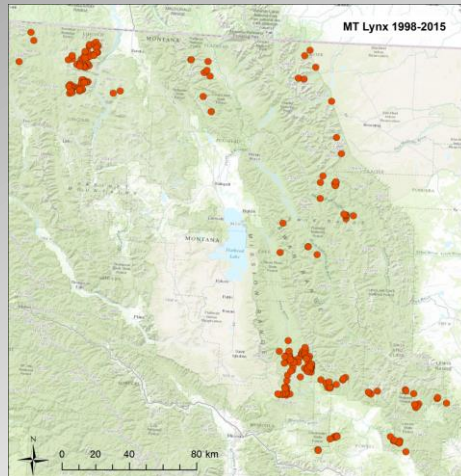
Purcell Mountains =

111 lynx

Central = 187

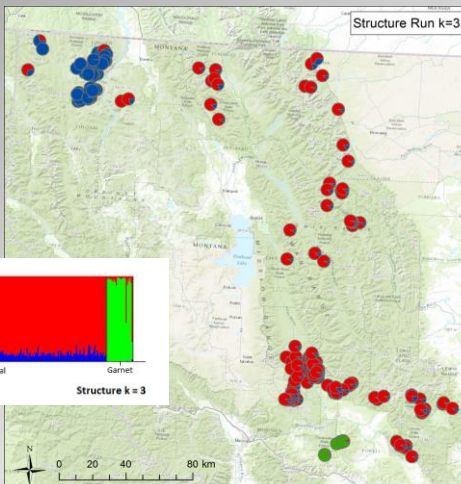
Garnett = 22

Total = 320



• 29

## Status - Montana



• 30

## Status - Montana

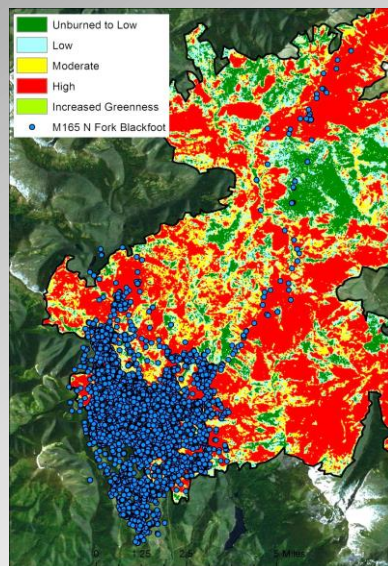
- However, in lynx core-habitat near Seeley Lake, MT, conservation land purchases increased protection across >100,000 acres of land.

• 31



## Risk factors - Montana

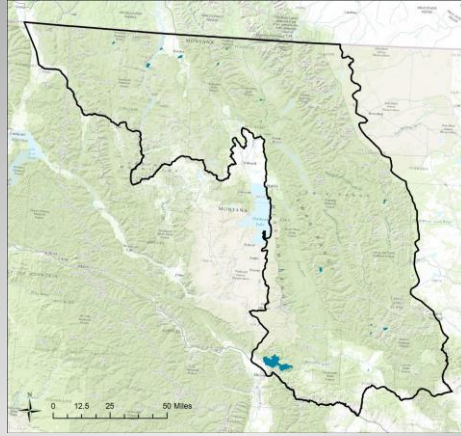
Lynx use of burns by severity





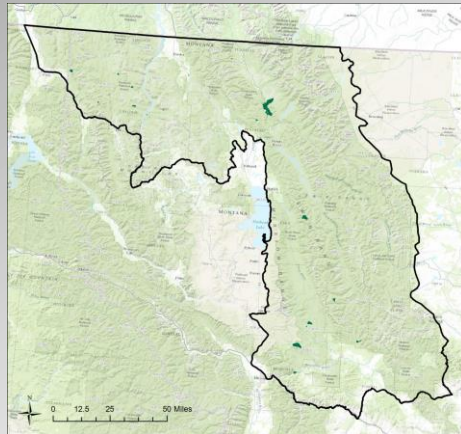
**1950**

29, 777 acres



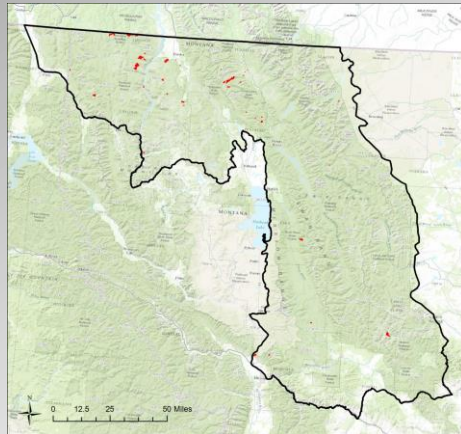
**1960**

17, 230 acres



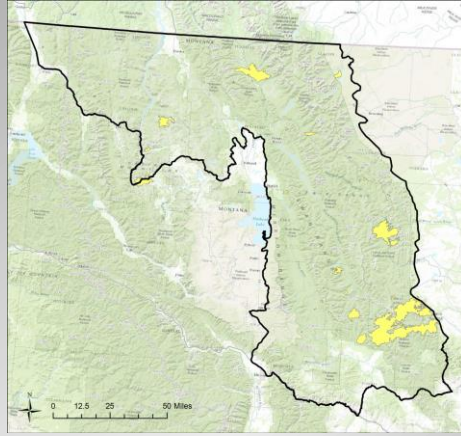
**1970**

14, 112 acres



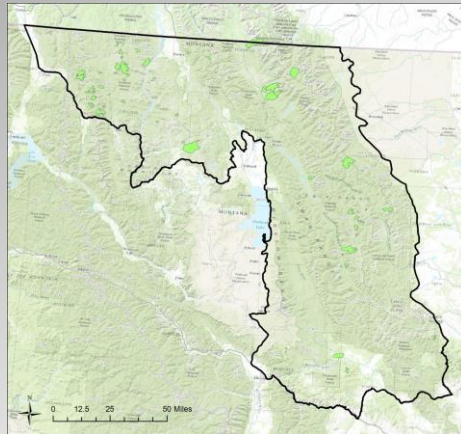
**1980**

307,310 acres



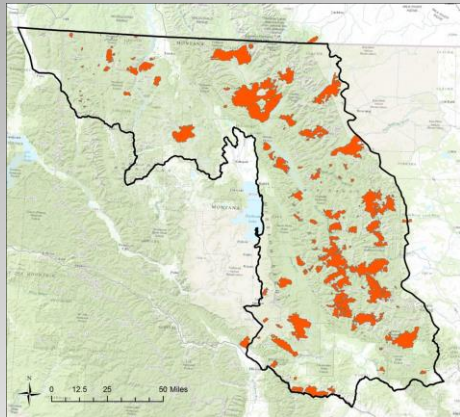
**1990**

143,123 acres



**2000-2013**

1,030,892 acres

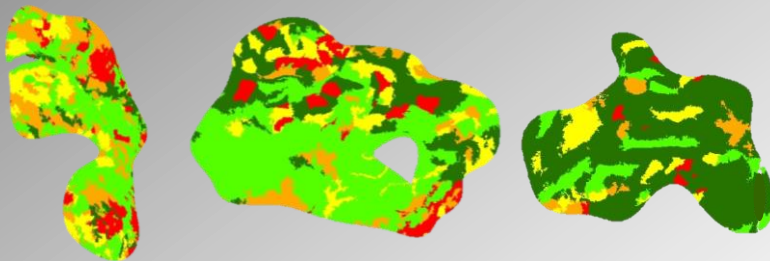


## Risk factors - Montana

- Lynx exhibit both positive and negative effects from forest silviculture
- Habitat relationships vary dramatically across contiguous US populations

• 40

## Index of Connectivity (IC) of Mature Forest



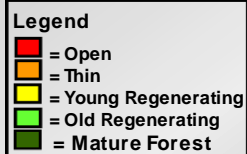
IC = 0.09

IC = 0.48

IC = 0.81

0

1



Because this metric is sensitive to area, we area-normalized correlation length, resulting in an index of connectivity ranging from 0 to 1 (K. McGarigal pers. comm).

To illustrate connectivity, these are examples of home ranges ranging from low connectivity of mature forest (left) to high connectivity of mature forest (right).

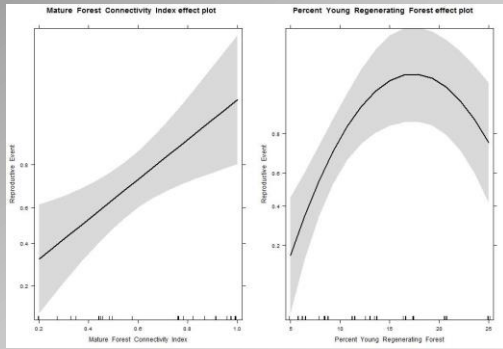
Notes:

F086: HR50 (Left side)

F212: HR90 (Middle)

F070: HR50 (Right side)

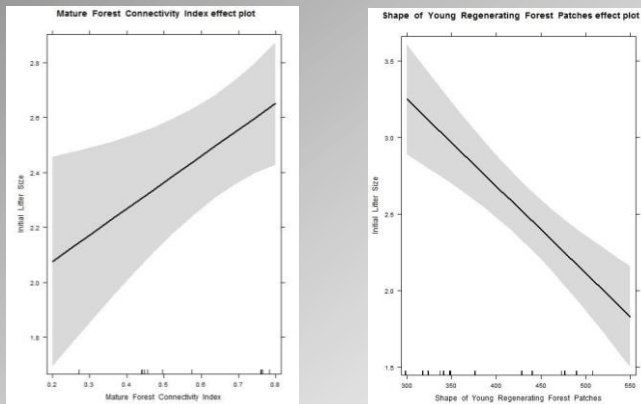
## Produce a Litter (Kosterman 2014) ?



| Top Multivariate Model            | $\beta$ | SE     | 95% CI         | p-value      |
|-----------------------------------|---------|--------|----------------|--------------|
| Connectivity mature forest        | 4.560   | 1.5345 | 1.552, 7.568   | 0.003        |
| Percent young forest              | 1.019   | 0.2614 | 0.507, 1.532   | $\leq 0.001$ |
| Percent young forest <sup>2</sup> | -0.029  | 0.0081 | -0.045, -0.014 | $\leq 0.001$ |

**Top Model:**  
 Females that produced litters had core areas (and home ranges) with greater connectivity of mature forest (figure on left) and intermediate amounts of young regenerating forest (figure on right) than core areas (and home ranges) of females that did not produce litters.

## Initial Litter Size



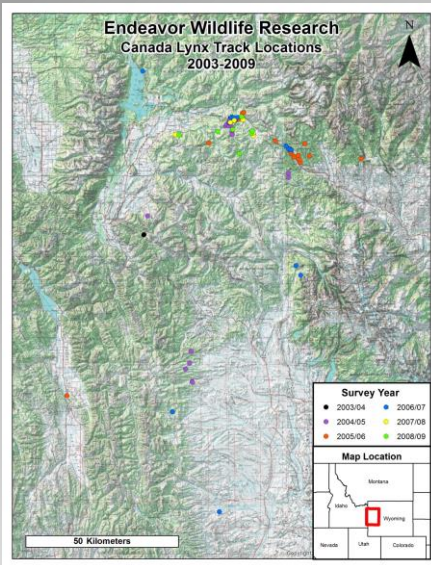
| Top Multivariate Model:    | $\beta$ | SE     | 95% CI         | p-value      |
|----------------------------|---------|--------|----------------|--------------|
| Connectivity mature forest | 0.959   | 0.3739 | 0.214, 1.705   | 0.013        |
| Shape young forest         | -0.006  | 0.0011 | -0.008, -0.003 | $\leq 0.001$ |

**Top model:**  
 Females with larger initial litter sizes had core areas with greater connectivity of mature forest (figure on left), and young regenerating forest patches with low perimeter-area ratio (figure on right).

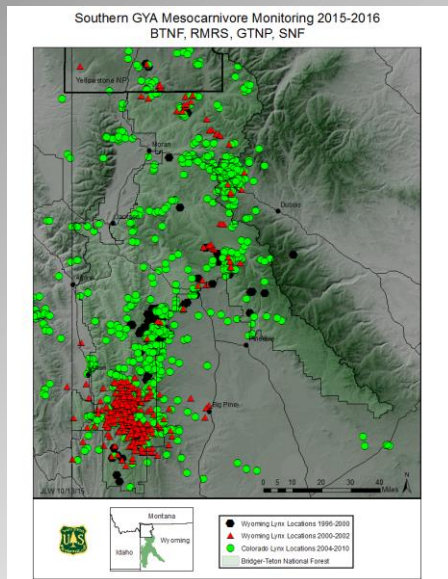
## Status – Wyoming

- Documentation of lynx in GYA since early 1900's
- Wyoming Range extending north to Togwotee Pass and east side of Yellowstone Lake former range





• 45



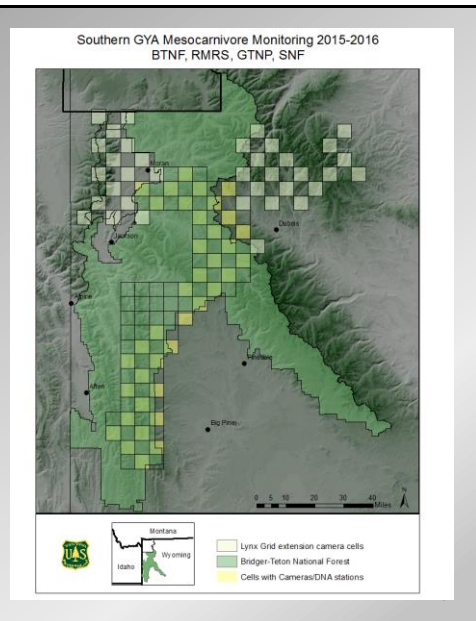
• 46

## Status – Wyoming

- 2010 surveys suggest the distribution of lynx in Wyoming contracted since 1997-2005
- RMRS, in cooperation with WGF, attempted to capture lynx but couldn't locate "natives" only 2 individuals from Colorado

• 47

## Status – Wyoming

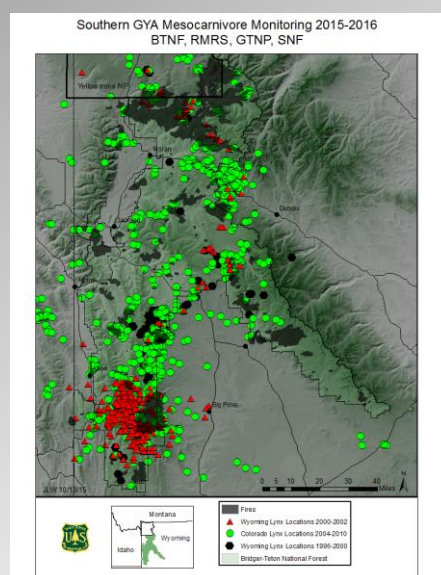


## Risk factors – Wyoming

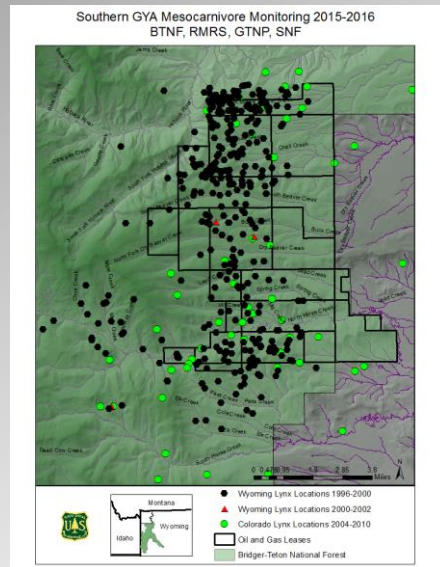
- Fire impacts to Wyoming Range
- Habitat fragmentation of Wyoming Range
- Oil / gas development of lynx habitat in Wyoming Range

• 49

## Status – Wyoming



## Status – Wyoming



## Issues and Conclusions

- Lynx in Montana and Wyoming (may be throughout the continental US) persist as small populations consisting of relatively few individuals
- As such, have heightened risk to environmental and demographic factors

• 52

## Issues and Conclusions

- Lynx distribution in Montana is similar to 2000, but with probably range contraction out of Garnet Range – cause of contraction unknown
- Small, relatively isolated populations may have persisted for long periods (duration unknown) based on records and genetic sub-structuring – long-lived individuals (average = 8.6 years, many females > 10ys)

• 53

## Issues and Conclusions

- In Wyoming, lynx had a record of occupancy and distribution from 1997-2008 (??); documented since the turn of the century. Was the GYA a large enough “pool” for persistence?
- Limited data suggest that distribution in Wyoming contracted or the population failed in approximately 2010

• 54

## Issues and Conclusions

- Vital rates do not suggest cyclicity

How to rectify “waves,” observed vital rates, and fine-scale genetic substructuring?

• 55

## Issues and Conclusions

- Increased fire intensity, frequency, and spatial extent in northern montane forests is a “the” primary risk factor to lynx habitat in Montana and Wyoming
- Humility is warranted when discounting “small” populations when challenged by environmental change

• 56

## Current Research

- Remap of lynx habitat in Montana based on a revised RSF based on new forest composition surface from remote sensing and other environmental covariates.
- Determining the trajectory of lynx habitat in Montana relative to fire and forest management – MSU collaboration
- Formally evaluating how lynx respond to silvicultural treatment by a retrospective analysis - management of patch-level mosaics

• 57

## Current Research

- Evaluating how lynx and hares respond to fire across a continuum of fire age and post-fire silvicultural treatment
- RMRS, in cooperation with the Bridger-Teton National Forest and the National Carnivore program, is conducting a formalized survey of lynx in the GYA incorporating sight-mark recapture via cameras and winter backtracking. Genetics collected using 3 methods – on backtracks, snags on baited trees (at camera stations), and snow-level rub pads.

• 58





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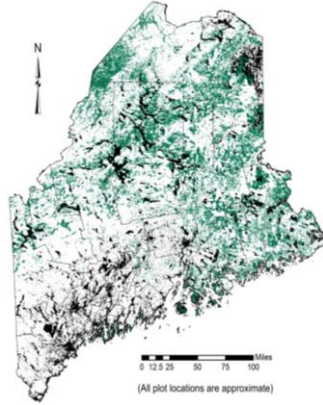
# Status of Lynx In Maine

I'll be sharing our observations of lynx in Maine, starting with a brief review of our lynx species assessment that summarized conditions in 2006 and then provide more recent observations on the status of lynx in Maine today.




## Maine's Forest – contiguous forestland

- ~18 million acres of forest
  - 6 mill acres spruce/fir
- Privately owned–forest mgmt.
- Limited development pressures
- Easements on 2.5 million acres
  - Protected from development
  - Active forest management




Distribution of spruce/fir forest type group, Maine 2012 (Homer et al. 2012)

About 90% of Maine is forested, so we have large tracts of forestland which is pretty unique. About 1/3 of Maine's 18 million acres of forest is classified as s/f covertime. Unlike most of the DPS, most of the land is privately owned and primarily managed for forest products. Although development pressures are limited, easements on about 2.5 million acres will protect these areas from development and most of this land will still have active forest mgmt activities.



## 1970–85 Budworm Outbreak

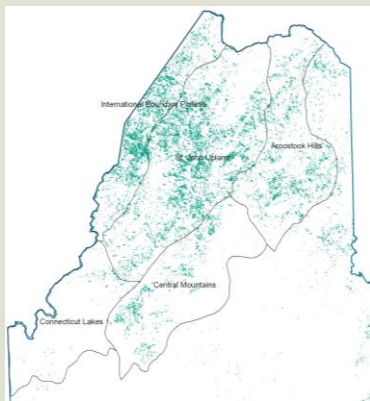


Like elsewhere, forest disturbance has the greatest influence on the amount and quality of habitat for lynx and snowshoe hare. The most recent disturbance event, occurred more than 30 years ago and was widespread with most of Maine's s/f defoliated by spruce budworm. This record spruce budworm outbreak led to extensive clearcutting of s/f and subsequent herbicide application to promote softwood regeneration.

## 1990s – Today Extensive Areas of Regenerating Forest



## Forest Conditions–Forest Inventory Data



3 million of acres of S/F forest

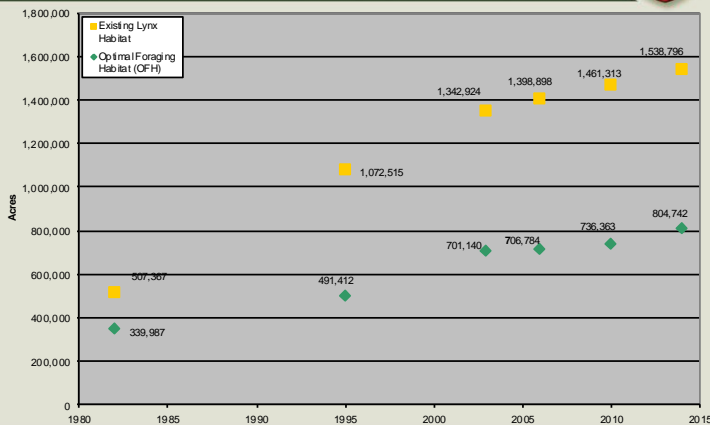
|      | Sapling     | Dense     |
|------|-------------|-----------|
| 1982 | ½ million   | 340,000   |
| 1995 | 1 million   | ½ million |
| 2006 | 1.4 million | 700,000   |

Source: Maine Forest Service – Ken Laustsen

Within 15 years, much of northern Maine s/f had regenerated into densely stocked sapling stands and they remain common today.

About half of Maine’s s/f forest is found in the 5 northwestern ecoregions that make up Maine’s core lynx range. Immediately following the budworm outbreak about ½ million acres of Maine’s s/f forest was classified as sapling, by 1995 it had doubled to 1 million acres and by 2006, 40% of Maine’s s/f forest was sapling and about half was classified densely stocked.

## Forest Inventory UPDATE 2014



For this meeting, Ken Laustsen from the MFS provided this update, which shows that habitat in the 5 NW ecoregions has continued to increase based on data collected during periodic forest inventories by the forest service.



## Monitoring Lynx in Maine



1. Radio Telemetry Study: 1999–2011
2. Periodic Winter Snow Track Surveys
  - 1995–98, 2003–2008, 2015–2017
3. Credible Sightings – MDIFW Staff
4. Incidental Take

We have been tracking the status of lynx in Maine for 2 decades, that has included periodic winter snow-track surveys, a 12 year radio telemetry study in northern Maine, and tracking credible lynx sightings, and monitoring take.

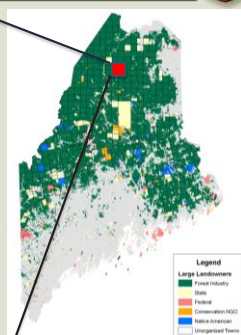
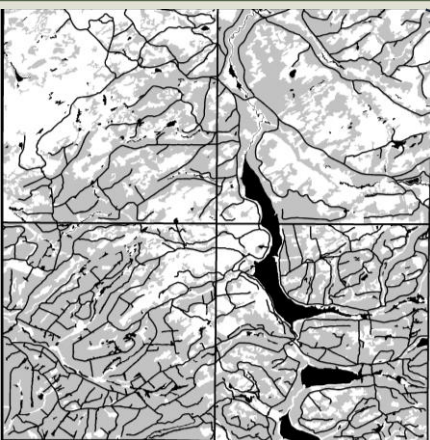
## Radio Telemetry Study: 1999–2011



- Captured 191 lynx
  - 113 kittens in 43 litters
  - 85 radioed
- Occupy small home ranges
- Lynx select best habitats
- Good reproduction and survival

Over a 12 year period, we captured 191 lynx, including 113 kittens in 43 litters and radio collared 85 lynx. Lynx in this study, occupied relatively small ranges, showed a strong selection for the best habitats, and were productive

## Radio Telemetry Study: 1999–2011



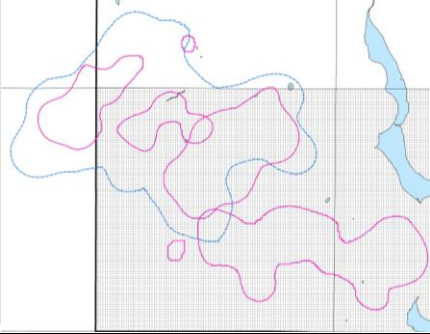
Budworm Impacted  
46% s/f clear cuts

Our study area was in 4 northern Maine townships, where regenerating s/f clear cuts were common (46%) of the study area.

## Radio Telemetry Study : 1999–2011



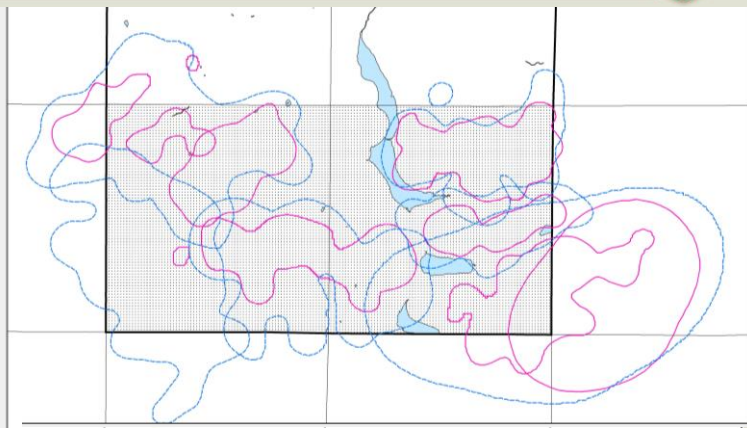
- Home range : 25 km<sup>2</sup> F, 50 km<sup>2</sup> M
- Male home range overlaps 3 females



Annual home ranges for adult females averaged 25 km<sup>2</sup> and 50 km<sup>2</sup> for males. Although hare densities in regen. Cc declined from 2 hares/ha to 1 hare/ha; annual hr size did not change.

Males shared their home ranges on average with 3 females, and their home range contain at least 1 females entire home range.

## Radio Telemetry Study : 1999–2011

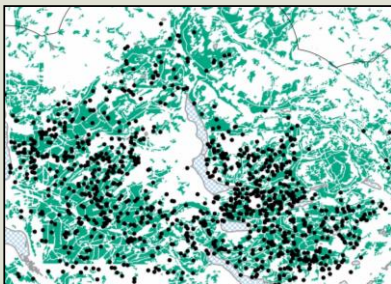


We estimated a density of 4.5 adult/100km<sup>2</sup>, based on the home ranges of 13 resident adult lynx (6 M: 7F) that occupied a 292 km<sup>2</sup> area.

## Radio Telemetry Study : 1999–2011



- Habitat Use – Selection for S/F sapling forest
  - 1,800–2,300 acres in Female HR
  - 3,000 –4,000 acres in Male HR



With the abundance of regenerating s/f clearcuts, we saw a strong selection for this habitat. For resident adult females, between 1,800 and 2,300 acres of their home range contained s/f sapling forest and resident adult males contained nearly twice as much since their home ranges were larger.

## Radio Telemetry Study: 1999–2011



### • Population demographics

- 65% of adult females with kittens
- Average litter size: 2.63 (range 1–5)
- Kitten Survival: 78%
- Annual Adult Survival: 76% (SE=3.37)
  - Predation
  - Starvation–lungworm



On average, 65% of adult females produced kittens with litters of between of 1 and 5 kittens. Regardless of hare densities, if females produce litters most kittens survived. We also observed high survival among adult radiocollared lynx. Of those that died, predation followed by starvation were the leading sources of mortality; starvation losses were attributed to lungworm.

## Reproduction: Lynx Study Area (400km<sup>2</sup>)



| Year | AF | # Litters | Productivity | Hares/Ha |        |
|------|----|-----------|--------------|----------|--------|
|      |    |           |              | in CC    | in SHW |
| 1999 | 1  | 1         | 100%         |          |        |
| 2000 | 3  | 3         | 100%         |          |        |
| 2001 | 4  | 4         | 100%         | 2.22     |        |
| 2002 | 9  | 9         | 100%         | 1.8      |        |
| 2003 | 7  | 6         | 86%          | 1.85     |        |
| 2004 | 9  | 7         | 78%          | 1.79     |        |
| 2005 | 5  | 4         | 80%          | 1.92     | 0.87   |
| 2006 | 7  | 1         | 14%          | 1.19     | 0.97   |
| 2007 | 7  | 2         | 29%          | 0.99     | 0.65   |
| 2008 | 4  | 0         | 0%           | 0.8      | 0.66   |
| 2009 | 4  | 0         | 0%           | 0.75     | 0.64   |
| 2010 | 5  | 5         | 100%         | 0.91     | 0.96   |
| 2011 | 1  | 1         | 100%         | 1        | 1.31   |

In years when hare densities in clear cuts avg. 2/ha, all females produced litters. When hare densities in clear cuts declined to less than 1 hare/ha, fewer females produced litters. However, perhaps what is more interesting is the fact that all females in the last year of the study, 2010 produced litters. Hare densities began to increase in s/f stands that were clear cut, as well as, those harvested using shelterwood techniques. The hare densities in this slide was provided by Dan Harrison's students at the U of Maine.

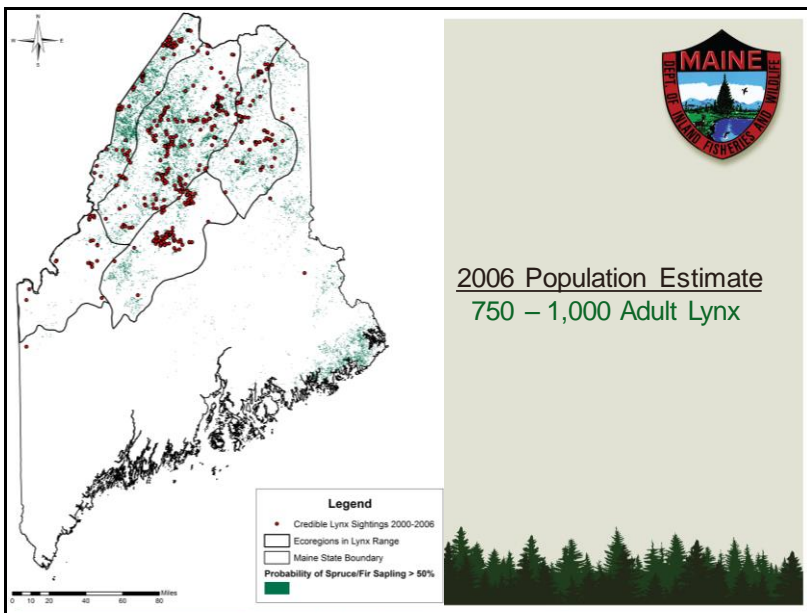
## Population Estimate



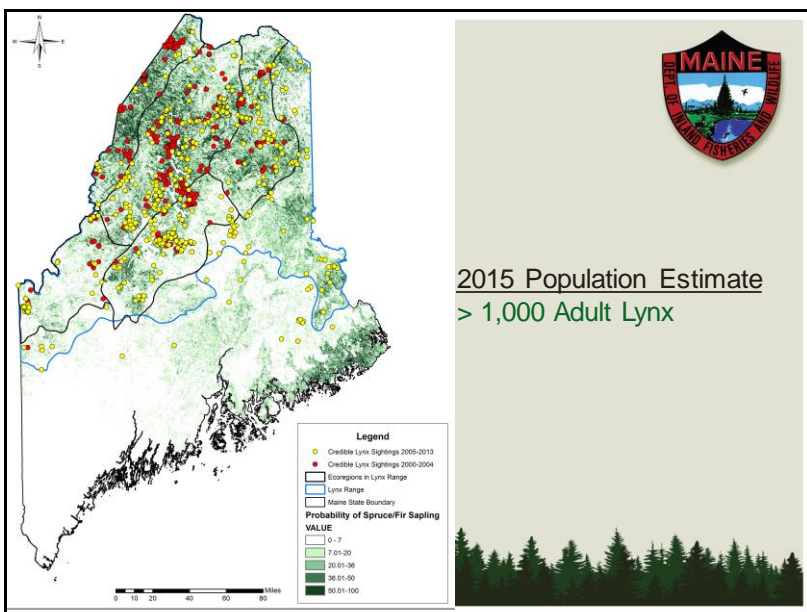
- Available lynx habitat in northern Maine – FIA
- Proportion of habitat occupied – track surveys
- Amount of lynx in occupied areas – habitat in h.r.

See Appendix IV – Maine's Lynx Assessment

For Maine's lynx assessment, we estimate Maine's lynx population by first estimating the amount of available habitat lynx in northern Maine using Forest Inventory Data (FIA) collected by the Forest Service annually. If you recall there was 3 million acres of s/f forest in the core range and half was classified as sapling. Then we estimated, the proportion of habitat occupied by lynx based on periodic winter snow track surveys. And we estimated the number of lynx in occupied areas based on the amount of habitat in female and male hr.



Although, we've heard estimates of 500 lynx in Maine, we view our estimates as conservative, since we restricted the estimate to northwestern Maine and only produced estimates of the number of adults, when there were many kittens on the landscape.



When preparing the species assessment, we thought Maine's lynx population had peaked because of observations of lower hare densities in older regenerating clear cuts and lower reproduction observed during telemetry study. However, other indices since 2006, suggest Maine's lynx population is continuing to grow as evident by credible lynx sightings by IFW staff. Where sightings between 2000 and 2006 are seen again in red and recent sightings are shown in yellow. Lynx sightings are no longer novel in northern Maine and staff have indicated that they do not report all sightings. Thus, recent sightings are likely underreported. Although we haven't updated estimates, it seems likely that Maine's lynx population exceeds 1,000 adults.



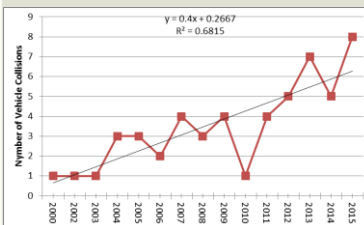
## Credible Sightings



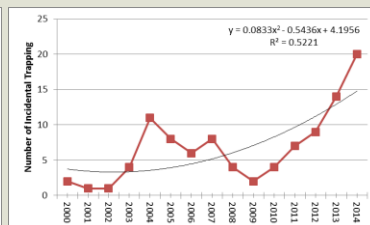
## Indices suggest Maine's lynx pop still increasing



### Road Mortalities



### Incidental Captures in Traps



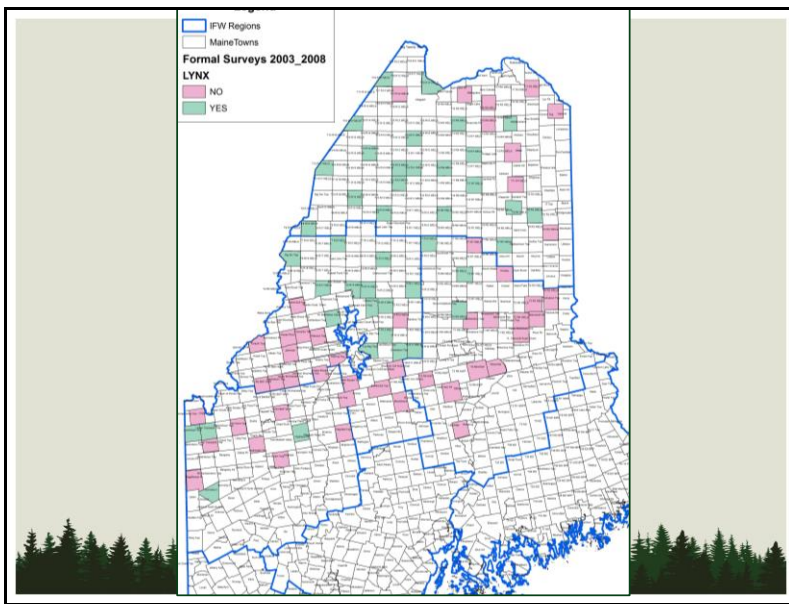
We have also seen an increasing trend in road mortalities since listing. And despite declining trapper number, incidental catches of lynx are also increasing. – In addition, when we examine these animals these animals are healthy; within the expect weights for their age and sex class.

## Periodic Winter Track Surveys

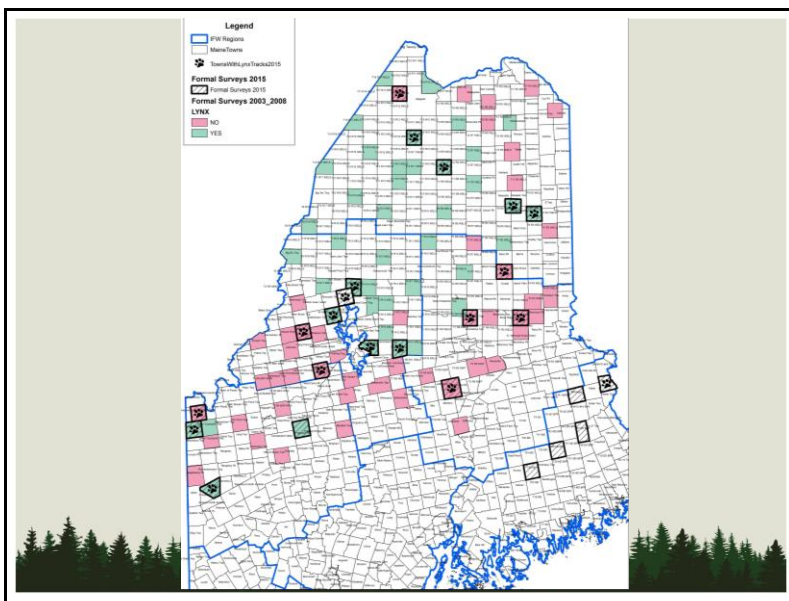


- Snowmobile 55–80 km Unplowed Roads / 100km<sup>2</sup>
- 24–72 hrs. after snow/wind event
- GPS survey route and track intercepts
- Collect additional data at track
  - Photograph
  - Measurements
  - Assign STQ
  - Number of Individuals
  - Direction of Travel

Following the same methodology, we have periodically surveyed towns in northern Maine to document lynx presence. These surveys involve traveling 55-80 km of unplowed roads by snowmobile, 24-72 hours after a snow or wind event and marking each lynx intercept, as well as, additional information at each track to help assess the number of individuals present at time of survey.




Between 2003 and 2008, we surveyed 93 towns in northern and western Maine and encountered lynx tracks in 43 towns primarily in northern Maine (depicted in green here).



In 2015, we surveyed 24 towns in northern and western Maine (as well as a handful of towns in eastern Maine) and encountered lynx tracks in both areas where lynx were observed previously, as well as, areas where lynx were not previously observed. Areas we surveyed are depicted by dark outlines, those with lynx have a track overlaid on the township and those w/o lynx are marked with hash lines.

## Monitoring Lynx – Track Surveys



| Time period | Number of towns surveyed | Number of towns with lynx | % occupied |
|-------------|--------------------------|---------------------------|------------|
| 1995–1998   | 116                      | 10                        | 9%         |
| 2003–2008   | 91                       | 43                        | 47%        |
| 2015        | 24                       | 19                        | 79%        |

19 towns surveyed in 2003–08 and 2015

| Time period | Number of towns surveyed | Number of towns with lynx | % occupied |
|-------------|--------------------------|---------------------------|------------|
| 2003–2008   | 19                       | 11                        | 58%        |
| 2015        | 19                       | 18                        | 95%        |

During 1990s surveys, we found lynx in 10 of 116 towns surveyed.

In early 2000s, we found lynx in 43 of 91 towns surveyed.

In 2015, during the initial survey year of our 3rd periodic survey, we found lynx in 19 of 24 towns.

If we look at just the 19 towns surveyed in the early 2000s and in 2015, we found lynx in nearly every town surveyed in 2015, compared to just 58% during early surveys.



## Lynx SSA Expert Elicitation Workshop – Notes

Bloomington, Minnesota

October 13-15, 2015

*Note to Expert and Participant reviewers: These notes represent the notes taken during the workshop, and they have been reviewed (and in some cases amended with notes taken separately) by the SSA Core Team members. Please review these notes, make any necessary corrections and/or clarifications using “Track Changes,” add any additional thoughts or considerations in the space provided at the end of this document, and return via email to [jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov) by Monday, Dec. 7, 2015.*

*Presentations and handouts referenced in these notes will be sent via separate emails. The U.S. Fish and Wildlife Service (Service) will prepare and disseminate to workshop participants a Workshop Report summarizing the proceedings and providing the Service’s analysis and assessment of the information gathered at the workshop. That report will also include these notes and comments/edits provided by reviewers.*

**Attendees** - See attendee handout.

### **Day 1**

#### **Introductory Presentations by USFWS**

Welcome and introduction from Jodi Bush, Field Supervisor of the Service’s Montana Ecological Services Field Office. Thanks to everyone for joining us for this important meeting. As you know, we are here to assess the current condition and future viability of lynx in the contiguous U.S. distinct population segment (DPS). This workshop is intended to inform the Species Status Assessment (SSA) that we’ve undertaken for the DPS, which will inform future decisions we need to make under the ESA, including recovery planning. However, this workshop is just about the science and best professional judgments of the experts; we will not be discussing ESA policies or making decisions about the listing status of the DPS or future recovery goals or criteria, etc.

Goals/objectives/background – See Jim Zelenak Overview slides. Where data are lacking, elicit expert opinion on the status, threats, and future viability of the lynx DPS. Complete a SSA for lynx – will be the scientific underpinning for decisions on lynx in the future. SSA will inform recovery planning and 5-year review. Provided overview of listing history. Six areas within the range of the listed DPS currently support lynx populations.

Covered FACA/APA concerns given the information from the handout (attendees were given the handout “Using Expert Meetings for SSA” whitepaper) prior to and again at the workshop. Clarified to the participants that all info from the workshop is subject to FOIA. Meeting is not to make policy decisions (e.g., whether there should be multiple DPSs), develop recovery goals or objectives, determine



the “right” answer or seek consensus. Rather it is to document range of knowledge and opinion regarding current status and likely future conditions for lynx in the Lower 48 states.

SSA framework overview covered – SSA fact sheet provided to attendees.

Conceptual model handouts provided – in draft form, will be used for elicitation process this week, looking for feedback from the experts.

Overview of the expert elicitation process – we will be eliciting expert judgment/opinion on areas of uncertainty concerning lynx. We will use modified Delphi approach to elicitation – involves eliciting individual input from the experts. Will explore what information/data/reasoning is influencing expert opinion on a particular question. There will be opportunity for reconsideration after discussion. We are not seeking consensus answers to questions asked. We hope to raise the level of lynx related knowledge of the group as we progress through the workshop.

Overview Presentations: (See also the presentation files from presenters)

Historic and Current Distribution of Lynx in the Contiguous US – Kevin McKelvey

- Issues w/ lynx distribution – frequently confused w/ bobcats, a problem for relatively rare species like lynx, which can cause misidentification to corrupt the data without proper screening of occurrence records.
- Provided examples of potential error rates when a similar species (bobcat) is much more abundant; even with relatively high (90%) identification success, only a few misidentified bobcats can cause significant error in lynx “observations.”
- Described need to rely on “verified records” to screen out poor data/misidentification.
- Lynx periodically move south in pulses/waves (irruptions) from Canada. Some lynx end up in places that may support them over time; others end up temporarily in places where they cannot persist. How to determine which places support permanent populations vs those that only have lynx temporarily during or after pulses?
- Largest pulses of lynx seem to be ~1960, 1970, 1980, and lesser pulses in recent decades.
- Evidence of historical populations in WA, ID, MT, MN, ME, MI, NH based on persistence over time and/or evidence of reproduction, habitat, etc.
- No current populations in NH, NY, VT, MI, WI. May be a small population in Greater Yellowstone Area (southwest MT/northwest WY).
- No evidence that lynx were widespread across contiguous U.S. historically.
- Nearly all areas of suitable habitat (with adequate snow resources) seem to be occupied in the lower 48 states. There are a few exceptions.
- The historic data are in the form of recorded occurrences, which allows for inference about past distribution but not abundance.
- Historic records are both finite and often unreliable.
- Group discussion following this presentation brought up the fact that IUCN is updating their Red List evaluation of lynx, to be released in November, which will include their estimate of distribution and trends (Vashon).

- It was asked why lynx appear unable to establish/maintain populations in most of Idaho, given seemingly viable habitat and many historic records. Presenter indicated there is no clear answer based on the evidence in the record.

#### Lynx Regulatory Environment 2000-2015 – Scott Jackson

- Pre listing there was very little regulation on Forest Service lands specifically for lynx.
- Pre listing, interagency lynx steering committee, science team and bioteam were formed to direct compilation of the Lynx Science Report, Lynx Conservation Assessment and Strategy (LCAS, 2000), Biological Assessment of 1999, all to guide conservation and land use management on Federal lands.
- Listed due to inadequacy of existing regulatory mechanisms.
- FWS Biological Opinion in 2000 directed USFS to revise 113 forest plans and develop Conservation Agreements to guide management and lynx conservation until forest plans were revised. Some units are still operating under Agreements, though most national forests with lynx or potential lynx habitat have formally amended their Forest Plans.
- Post listing, Conservation Agreements between USFWS, USFS, BLM – “likely to adversely affect” projects would no longer occur. BLM and USFS began updating land use plans to align w/ LCAS (2000) standards and guidelines. LCAS was revised in 2013.
- LCAS (2000) principles: identified 17 risk factors and measures to reduce these risks, guidance on how to map Lynx Analysis Units (LAUs), forest management prescriptions to benefit lynx.
- Revised LCAS (2013) – new science, core area emphasis, anthropogenic influences (2 tiers) instead of “risk factors”, fewer conservation measures (vs. “standards and guidelines” from 2000 LCAS). Secondary/ peripheral habitat combined into “non-core” areas in the revised LCAS.
- Focus of regulations has been on Federal land, primarily in the West. There are other issues on private lands and unique regulatory issues in Maine (Maine Forest Practices Act of 1989).
- LCAS (2013) identified greatest potential influences from climate change, forest fragmentation, wildland fire management, and vegetation management (timber harvest/mgmt. and silvicultural treatments).
- Areas of greatest uncertainty = large scale, high intensity fires in the West, wide scale insect outbreaks, changes in silviculture that may or may not benefit hares and lynx.
- Amount of lynx habitat in Federal ownership varies among 6 units from 98% in the Cascades to 1% in the Northeast.
- A question regarding landownership was raised - do we have a breakdown of land-ownership for each of the 6 geographic areas? JZ – we have broken each critical habitat unit by ownership, but we did not designate CH in Colorado/S. Rockies, though ownership info there is also probably readily available.

## Lynx Genetics Considerations – Michael Schwartz

- Reviewed all published papers on lynx genetic studies in N. America; summary that global results for measure of genetic variation (17 populations) shows high genetic mixing, some sub-structuring over distance, but ample gene flow continent wide.
- N. Rockies provide some gene flow restriction, as well as an invisible barrier to gene flow in eastern Canada south of James Bay/Hudson's Bay that may be related to snowfall. Other than these, there are unlikely to be barriers to genetic interchange throughout much of the lynx range in boreal forest.
- River systems can influence genetic sub-structuring.
- Some genetic drift within the smallest populations; some genetic substructure in populations in eastern Canada and south of the St. Lawrence, island populations (Newfoundland and Cape Breton); however, there is evidence that there is interchange of lynx between each generation in eastern Canadian populations.
- Some evidence that we are seeing gene flow out of Canada into US lynx populations during population surges.
- Discussed levels of genetic sub-structuring of lynx in MT – river valley and highway may be causing sub-structuring.
- Hybridization w/ bobcats does occur – studies have shown hybrids in MN, and Maine, no hybridization in west detected so far. Very low numbers. Does not seem to be a major issue nor is there evidence that hybridization is increasing despite significant increases in bobcat numbers.
- Genomic studies can increase power and look for genes under selection.
- Recommended conservation goal for lynx should be to conserve genetic diversity currently represented in the 6 populations in the lower 48 states. Recognize that this variation at the edge of the range may be of value to future populations, especially as related to changing climate.

## Lynx Distribution, Status, and Management in Southern Canada – Jeff Bowman

- Each province has its own management program for lynx, each with its own harvest (trapping) policies and strategies.
- British Columbia, Alberta, Saskatchewan, Manitoba – trapping numbers show peaks in 60's, 70's and 80's. Smaller peaks in lynx numbers trapped since then. Eastern provinces show higher peaks in lynx trapped in 1990, 2000 than the western provinces.
- Peaks in lynx numbers lag behind hare peaks by one year. Peaks occur roughly every 10 years. *[Note to presenter - please clarify if this statement is correct or if the lynx peaks in the east followed lynx peaks in the west by one year].*
- Potential range contraction in eastern Ontario from 1960's to 2010, southern boundary moving north. Genetic study also supports trailing range-edge effect.

- New Brunswick and Nova Scotia have listed lynx as endangered provincially; these two provinces have high numbers of bobcats, probable correlation. Other provinces status seems secure (COSEWIC review).
- Data show large peaks of hares/lynx in 1960, 1970, 1980; cycles since then are dampened, may be a future trend?
- Noted recent genetic studies show some genetic differences (unique alleles) south of the St. Lawrence, but differences are not large.
- Lynx range contraction in southern Ontario because of changes in forest practices, increase in tolerant hardwoods. Seeing less genetic heterozygosity (allele richness) at the range margin.
- “Invisible” genetic barrier south of Hudson’s Bay likely related to winter snow. Effect will likely increase in the future with climate change. May be habitat “imprinting” (snow conditions) between east and west Canadian populations.
- Nova Scotia and New Brunswick have largest bobcat populations in Canada.
- There was a question: Why are forests changing in Southern Ontario? It is likely a combination of things - the movement towards management of small scale disturbances, increased control of fire and other disturbances, less wide-scale logging than in the past, now more natural hardwood forests than in previous years. Management not caribou driven (caribou are farther north).

#### Introduction and Discussion of Lynx Conceptual Models – Jonathan Cummings

- Presented the 4 draft conceptual models to the experts (see handouts).
- Simplified viability model, and one each for resiliency, redundancy, and representation.
- We will be seeking expert input on the models this week, will inform elicitation

#### **Day 2**

#### Overview Presentations (continued):

#### 7 Ways a Warming Climate can kill the Boreal Forest – Lee Frelich

- Boreal forest may disappear from Minnesota by end of century.
- Temperate tree species are invading boreal forests at local and regional scales, mixed ecotone spreading; deer herbivory may temporarily slow hardwood invasion of conifer stands.
- Higher summer temperatures in northern MN (5 to 12 degree F increases projected by 2100).
- Prairie-forest border may move north by 150-300 miles by 2100.
- Some authors project a 300 mile northward movement of boreal forest continent wide by end of the century.
- Severe drought 8 of last 10 years.
- High emissions scenario – no paper birch in US.
- Aspen, fir, spruce will be reduced to absent in US.

- Insect outbreaks will increase with climate change.
- Small triangle of boreal forest in northeast MN (Arrowhead region) likely to hang on to end of the century because of higher elevation of area and lake-effect snow. This is not the entire arrowhead region, just a small proportion of it that is of relatively higher elevation.
- Discussed 7 ways in which boreal forest will be converted to temperate forest over time w/ climate change.
- Frequency of large damaging storms will increase, facilitating temperate forest conversion.
- *Tamara Smith asked whether forest managers are managing with climate change. Are they resisting and keeping forests in softwood or working with the predicted changes and managing more for hardwoods (e.g., maples)?*

#### Climate Change and Uncertainty: Implications for Canada lynx Conservation and Management in the Contiguous US – Alexej Siren

- Lynx presence associated w/ snowpack persistence greater than 4 months and deep (>270 cm per year in Northeast), fluffy snowfall.
- Discussed ways in which climate may influence lynx - population cycles and viability, increased competition with bobcats, hare coat-color mismatch, access to hares.
- Warmer global mean surface temps in recent decades and into the future.
- Warmer winter temps, especially in the Northeast US where increases will be greatest.
- Winter precipitation projected to increase in eastern US, drier in western US.
- Discussed emissions scenarios and projected changes across the range of lynx, see presentation file.
- Northwest - overall drying, slight increase in winter precipitation, unsure how much will be snow (vs. rain).
- Northern Rockies - increased winter temperature and precipitation but not in NW Montana; long term may have best snow conditions for lynx because of high elevation; depends on snow depth and quality.
- Southern Rockies - declining number of days below freezing, decline in winter snow and snowpack.
- Great Lakes - increase in winter temperatures but increase in lake-effect precipitation and snow because of loss of ice on great lakes; in short term - best snow conditions for lynx.
- Northeast - increase in winter temperatures and precipitation, dryer in summer, decrease in days below freezing and persistence of snowpack.
- Generally across the range warmer winters, less snowfall and snowpack, warmer summer temps, increase in winter precipitation and non-snow precipitation in winter, less precipitation in summer, decreased snowpack period.

## Projected Climate-change Impacts on Snow, Vegetation, and Lynx Populations in the Western US – Josh Lawler and Chad Wilsey

- Vegetation modeled across western range of lynx under climate change projections to end of century – shift from subalpine forest to temperate evergreen needleleaf forests in western lynx range.
- Projected decrease in lynx-appropriate forest across range in western states.
- Fire projected to double by 2040 and triple by 2080; projected increase in fire frequency and larger fires.
- Modeled lynx habitat and lynx ecological traits w/ climate change scenarios – projected simulated densities in lynx in western range in 2020s, 2050s, 2090s.
- Shows some decrease in lynx densities across western range; decline of lynx habitat suitability in the Northwest; greatest likelihood of persistence in NW Montana.
- Also looked at effect of population cycling impact on projected changes – overall changes in density not affected by population cycling.
- On average simulated moderate declines in Canada lynx – some growing populations and some declines.

## Forest Management and Lynx Habitat Trends – Erin Simons-Legaard

- Eastern spruce budworm outbreak cycles in Maine became more wide ranging since 1970's (historically outbreaks at roughly 65-year intervals; recently 30-40 years; severe outbreak in the 1970s).
- Severe spruce and fir budworm mortality was followed by large-scale clear cuts mid-1970s - mid-1980s to salvage-harvest trees - created current lynx habitat.
- Regulations (Maine Forest Practices Act 1989) then put in place to manage clearcutting making cuts smaller, shift from clearcutting to various forms of partial harvesting; this caused the annual harvest footprint to double in northern Maine with lower quality habitat.; 65% of landscape has been affected by partial harvesting since 1989, which supports lower hare densities than clearcuts.
- Ownership changes in northern Maine, more and diverse ownership now than historically; REITS and TMOs; short-term investment horizon and different forestry outcomes.
- Non-development easements in place in many areas of northern Maine, but they do not regulate forest management.
- Conifer stem density influences hare density in Maine - hare/lynx habitat created by even-aged management and dense regeneration of spruce-fir.
- Timber harvest levels increased over past several decades, modeled tree species change over this time.
- Modeled lynx habitat into the future. Assumptions of forest practices used by current landowners. Also used stochastic modeling (which includes harvest).

- Lynx foraging habitat – spruce-fir forest – modeled to 2050 – high quality habitat for lynx is currently about 8% of the northern Maine landscape. Projections are that habitat and lynx occurrence will decline to about 5% of the landscape by 2030, and then level off.
- Prevalence of partial harvesting will lead to elimination of most areas with concentrated high-quality habitat. Most of the landscape will have a low (<30%) probability of supporting lynx.
- As clear cuts regenerate and age, become less appropriate for hares and lynx at about 35-40 years post-harvest, probability of lynx occurring in areas where they currently are will go down over time to 2050.
- When forest is disturbed, composition shifts to red maple and balsam fir; however, next outbreak of spruce budworm coming in 2 to 5 years, which may greatly affect fir component of lynx habitat.
- It is unlikely budworm will be controlled by spray; unlikely that landowners will clearcut and herbicide as they did in the last budworm outbreak.
- Quebec – currently being heavily impacted by spruce budworm outbreak, spreading to Maine, not likely to be managed in Maine.
- Snow will decrease in Maine in light of climate change (20% projected decline in snowfall).
- If quality hare habitat is greater than 50% spruce-fir forest, habitat for lynx should increase over time. But if hares require higher spruce-fir content, lynx habitat would go down as there will be fewer areas w/ high percentage spruce-fir content.
- Climate envelope modeling suggests balsam fir, white spruce, and red spruce will be largely gone from Maine and areas of eastern Canada by 2060.
- 

#### Southern Snowshoe Hares: Updates, Questions, Forecasts – Karen Hodges

- Northern hare cycles are highly variable; peaks and amplitudes do not line up as nicely as has been described in the literature.
- Some southern hare populations show “cycle-ish” dynamics and high densities.
- Flathead National Forest, MT in lynx CH, has high hare densities but no lynx, has bobcats, why?
- Regional differences in maximum hare abundances observed in highest quality habitats across western and eastern landscapes – presented distributions of hares in western and eastern states in lynx range, see presentation file for numbers.
- Reported hare densities w/ habitat attributes.
- Forestry that reduces stand structure reduces hare abundances, hares increase w/ number of years since pre-commercial and commercial thinning.
- Hares recolonize burned areas as soon as they become suitable as the stand regenerates over time.
- How many hares do we need to keep lynx around? Landscape hare densities of 0.5 hares/ha (LCAS) to 1.1 to 1.3 (Steury and Murray). Maine and MN landscape hare densities needed to support lynx in between these values. Question why the GYA with low landscape hare densities still (may) support lynx.

- Red squirrels are major alternative prey to snowshoe hares – little known about their densities.
- If we lose boreal forests we will lose snowshoe hares.
- Hares and shrubs – understory important to hares, but little studied. Need to be studying understory structure - are those data collected on National Forests?
- Impacts of climate change on hares – changes to habitat structure and changes from boreal forest to other types will impact hare abundance.
- Salvage vs clearcut – salvage logging post fire will lengthen time for hares to recolonize burned areas. In Quebec harvest may create higher hare densities than fire.
- Climate change will affect hares. Increased fire and insect outbreaks. Forests may not regenerate to boreal forest. Coat change mismatch (Mills paper) - had some concerns.
- Changing forest community - hare is only ~20% of bobcat diet (bobcats eating primarily red squirrels), hares used by fishers, raptors, coyotes, fox, etc. - diverse predator assemblage at southern edge of range.
- Uncertain of the impacts of bobcats moving into lynx territory.

#### Lynx Population Status and Threats Updates:

##### Maine/Northeast – Jennifer Vashon

- A “happy story.”
- 1990’s to today – extensive areas of regenerating spruce-fir forest in Maine – good for hares and lynx.
- This has resulted in a presumed increase in suitable habitat above likely historic conditions.
- 18 million forested acres in Maine; 6 million acres of spruce-fir, of which 3 million acres are lynx habitat.
- Lynx habitat (sapling habitat in Forest Inventory and Analysis [FIA] data) increasing in the state; 40% of total spruce-fir is in sapling stage.
- 2006 - 700,000 acres of dense spruce-fir stands; 2015 – now 805,000 acres.
- Discussed telemetry study in Maine, conducted from ‘99-’11, with 191 individuals – see presentation file for more details.
- Demographic values from the telemetry study resulted in an estimated reproductive rate of 65%, an average of 2.63 kittens per breeding female, and a 78% kitten survival rate, see presentation for full details.
- 4.5 adult lynx/100 square km in study area with 5 to 9 kittens.
- Strong selection for spruce-fir sapling habitat.
- Measured some demographics on survival and reproduction.
- 2006 pop estimate 750-1000 adult lynx, 2015 more lynx than 2006 and various indices (road mortality and trappings) suggest population still increasing.
- This estimate is based on estimated extent/amount of suitable lynx habitat and estimates of lynx density derived from the telemetry study. Total amount of habitat (from FIA data) X



proportion of townships with lynx tracks X densities observed on the study area = total Maine lynx population.

- Budworm outbreak and clearcutting to occur in the near future.
- Clear cuts still providing good conditions for lynx and hare 30 years post clear cut.
- Future impacts of changes to forestry resulting from Forestry Practices Act are unknown but likely will result in a decrease in lynx habitat.
- Does not believe that forestry guidelines are needed. Allow landowners to make choices on what they believe lynx need.

#### Minnesota/Upper Midwest – Ron Moen and Susan Catton

- “Non-estimate/guess” of 50-300 lynx in MN, confident of minimum of ~50 due to genetic sampling, but the other end of the range is speculative. High degree of uncertainty. In 2015, there were 133 DNA samples collected - 48 individuals with 20 recaptures.
- Lynx population in MN connected to Ontario, not separated; dispersal into and from Ontario is common.
- Discussed home ranges and cover types in home ranges - amount of regenerating (young) forest is predictive.
- Studied hare densities in NE MN, higher in southern Ontario. Much fluctuation in hare numbers in recent years.
- Lynx are concentrated on the landscape in areas of high-quality hare habitat.
- Majority of mortality in MN observed in radio telemetry study was human caused (incidental trapping, road mortality). This was a small study with ~20 collared individuals. *Tamara Smith noted that Twin Cities FO maintains an incidental take database that is cross-referenced to the Superior National Forest (SNF) DNA database.*
- Bobcats are moving into NE MN; harvest increasing from 2000 to 2015, but still very few in the Arrowhead (northeastern MN, where the lynx are).
- Projected to lose lynx habitat in the future w/ climate change. Several modeled scenarios show almost complete loss of snow suitable for lynx by 2095, only a small area extreme NE Minn may retain. *Mark McCollough asked if Lynx are projected to be gone by the end of the century.*
- Documented hybridization w/ bobcats, 13 hybrids among 268 individual lynx identified from DNA samples.
- In general male lynx in MN were more migratory, moving in and out of Ontario, whereas females tended to disperse and then remain in the new location, either going to Ontario to stay, or vice versa
- SNF conducts focused snow track surveys in areas known to have lynx. SNF collects genetic samples to identify individual lynx and to track persistence. Additional DNA samples are collected opportunistically (e.g., from road kills, incidental trapping, etc.). Their database contains 268 identified individuals (48 individuals identified in 2014-15 winter - 20 recaptures [including 2 hybrids] and 28 new lynx).
- SNF annually collects/tracks 3-5 family groups.

- Reproduction documented each year. One female lynx was tracked for 5 years - she produced 7 kittens in MN.
- SNF is working with Twin Cities FO and NC State University to refine the survey protocol to get more meaningful data with little added effort.

#### Montana and Greater Yellowstone – John Squires

- Wyoming – in 1990's and early 2000's few detections of lynx.
- Yellowstone – 3 lynx confirmed and reproducing in 2000-2004; few, if any, lynx remaining in the Wyoming Range and GYA since then despite extensive survey effort.
- Presence confirmed in Teton area in early 2000s; 2 individuals collared and movements recorded.
- Snow track surveys have been conducted over time, without any notable pattern, which have found ~ 6 tracks per year of survey.
- 2010 genetic sampling resulted in no "native" GYA Lynx individuals being identified - only lynx that dispersed from Colorado.
- Oil and gas leasing – potential risk to lynx in WY, overlaps lynx range in the Wyoming Range of western/northwestern WY.
  
- Montana – more lynx in northwest MT than GYA.
- Studied reproduction and litters in MT in Seeley Lake Area and Purcell Mts.
- 175 individuals were collared; the average lifespan for lynx in this area is 8.6 years.
- An average of 2.5 kittens per litter (2.25 in Seeley Lake and 2.95 Purcell Mtns.). Productivity was ~0.7 on average, and annual survival was 0.5 for sub-adults and 0.75 for adults on average.
- Lambda (rate of population increase) was 0.92 for the Seeley Lake area (e.g., population declining) and 1.16 for the Purcell Mtns. (population increasing).
- Lynx have recently contracted/perhaps extirpated from the Garnet Range.
- Modeled monthly survival rates – see presentation file for numbers.
- Predation (mountain lions), starvation, and human-caused mortality each about 1/3 of documented mortality in MT.
- Evidence of cyclicity in vital rates was not observed.
- Most of MT probably decreasing lynx abundance.
- Lynx habitat in core area in Seeley lake, hundreds of thousands of acres "protected"
- 2000-2013 over a million acres burned in lynx range in MT.
- Good habitat is habitat in which females produce litters, positively related to connectivity to mature forest and low fragmentation.
- Lynx persisted in low population numbers in WY and MT, may not currently be any lynx in WY.
- Last surge/wave of lynx out of Canada was in 1980s; no recent surges have been observed in sampling areas, is this related to the status in MT today?

- Fire prevalence in the last 13 years is far greater than it was for the previous decadal periods going back to the 1920s? *[Note to Reviewer- is this date correct?]*. Major factor in persistence of lynx in MT.
- Silviculture in MT has both positive and negative effects - not much evaluation of whether the USFS guidelines are working.
- No evidence of “waves” of lynx during hare/lynx peak: little demographic effects. Are we in a “lynx drought?” Recent wave of lynx from Canada seem relatively low magnitude, thus MT population slowly declining?

#### Parking Lot topics (Answered on day 3)

- 2000 LCAS is adopted in Forest Service plans, still operating under 2000 LCAS standards and guides. The 2013 LCAS is less restrictive than 2000 version, so by operating under the 2000 version the 2013 standards and guides are sufficiently covered.
- If Maine’s lynx population is so large, why was the State’s incidental take request for lynx relatively low?
- How exactly did Maine estimate lynx population?

#### Northern Washington – Ben Maletzke

- Lynx are state-threatened in WA; possible justification to update to endangered status based on current status of threats.
- DNR has a management plan (HCP) and recovery plan for lynx.
- USFS has 98% of lynx habitat in WA.
- Okanogan Lynx Management Zone (LMZ) only area in WA w/ consistent lynx records from 2005-2015
- Went over 5 listing factors in WA:
  - o Reg mechs/lynx plans in place;
  - o No disease, little predation, could increase w/ climate change and snow changes;
  - o Bark beetle, bud worm – trees dying, increased fire, many burned areas in previously good lynx habitat, see presentation file for numbers;
  - o Regeneration of burned areas could create good habitat, but takes 20-40 yrs for these areas to grow up to hare/lynx habitat again;
  - o Climate change may have effects on veg cover, precipitation, fire size and frequency, prey densities;
  - o Small blocks of populations, vulnerable to stochastic events;
  - o Connectivity of Okanogan w/ Canada okay, Kettle crest less connected to Canada.
- Rough ideas on population. 1990s there were 90 to 120 females, currently as few as 24 females.
- Lynx currently have larger home ranges, reduced habitat. May be vulnerable to trapping in BC Canada. No long term studies - snapshots of data.

- Discussed WA potential management and recovery actions - concerned about climate change effects on snow depth, quality (crusting), duration and effects on fire frequency.
- Connectivity during surge events from Canada more important for areas other than Okanogan in WA; have not seen waves of lynx during recent high hare/lynx years in Canada.
- Thoughts for future study include probability of population persistence, need and feasibility for augmentations, collaboration with British Columbia, state status in WA, management, surveys and monitoring.

#### Colorado/Southern Rockies – Jake Ivan

- Showed map of 90% UD – most hanging around southwest and central CO.
- State endangered (1973); widespread federal predator control 1910s-1920s .
- 1978-1997 statewide surveys (11) found only a few tracks.
- 1999-2006: 218 lynx translocated from Canada and Alaska. During the period of monitoring (1999-2010) the population persisted and had relatively high annual survival, relatively high reproduction.
- First denning documented in 2003, 48 dens by 2010.
- Modeled population – trajectory of pop is slightly increasing maybe, but at least holding steady.
- Intensive monitoring concluded in 2010; now conducting occupancy monitoring (only in San Juan Mountains now; hope to expand to rest of potential habitat and for 10 years) and hope to be able to detect trends.
- Evidence of some continued reproduction 2010-2015 (kittens at camera stations, and 38% of Squire’s captures were “new” individuals).
- Current survival unknown.
- Potential threats – climate change, bark beetle epidemics, fire, concentrated recreation (seem tolerant of humans, but more and more people in the backcountry), highways.
- Spruce-fir moderately vulnerable to climate change, habitat expected to migrate upslope over time.
- 4 million acres of trees killed by bark beetle, but lynx are still using beetle kill areas for now as long as understory vegetation is available for hare production.
- Potential elevation refugia may be unique for lower 48 states for climate change.
- Development (extensive ski areas) may be affecting lynx (avoidance).
- Red squirrels can provide 25% (Jake - was this 25% or 20%?) of lynx diet, but losing cone-producing trees at large geographic scale after beetle outbreak may be significant during landscape level dips in hare density.
- Lynx snow track and camera surveys have been initiated.

#### Expert Elicitation of lynx status via questioning on representation, redundancy and resiliency

Following the presentations, an expert elicitation was conducted to collect additional information on the status of lynx for each the three measures of viability used in a species status assessment, namely the

levels of representation and redundancy for the DPS, and resiliency for each lynx population/geographic area within the DPS.

### **Redundancy Questions:**

1. List the factors/catastrophic events that could eliminate an entire population.

Response Type: index card list

- Some discussion around defining catastrophic event – a single point in time event, ex. Hurricane, large fire vs event that takes 10 yrs to occur or series of events. For this question the event was defined as a single point in time. And discussion around population – in this case each of the 6 geographic areas is a “population”. Eliminate means functional extirpation.

- Experts asked whether climate change was considered a catastrophic event; USFWS answered that because it operates and its effects are manifested over longer time frames, it should not be considered a catastrophic event for the purposes of this elicitation.

- Experts asked whether the “population” lost meant the DPS in its entirety or a single one of the 6 subpopulations or units. Experts were asked to consider the loss of any one subpopulation.

- See Redundancy expert response handout.

2. Could any of the catastrophic events listed eliminate all 6 populations/geographic areas simultaneously?

Response type: experts supplied a written response of yes or no.

- See Redundancy expert response handout.

3. What is the probability that any single population could be eliminated by a single catastrophic event in the next 10 yrs?

Response type: 1-point elicitation.

- See Redundancy expert response handout.

4. What is the percent likelihood that a series of catastrophic events within the next ten years could cause functional extirpation of one or more lynx populations?

Response type: 1-point elicitation.

- See Redundancy expert response handout.

5. How long would a population eliminated by a catastrophic event require to become reestablished naturally?

Response type: 3-point elicitation.

- See Redundancy expert response handout.

### Day 3

Parking lot questions: How was pop estimate in Maine done? – Jenn Vashon answered: FIA data to estimate the amount of spruce-fir forest in the core lynx range, FIA data to measure how much was sapling, winter snow track surveys used to estimate the proportion of habitat that was occupied. Looked at areas to likely have lynx vs all the areas, tells how much of the habitat is likely occupied by lynx in 2006. Looked at home ranges of lynx, how many acres are in a female and male home range. If lynx could occupy all the spruce-fir and all the spruce-fir sapling available to give estimate of number of lynx.

How did you determine primary predation in Maine? Jenn Vashon: Found primary predator was fisher. A lot of skepticism around this. Close tie to snow storms and lynx bedding in hardwood forests, where fisher are. Assume they were killed while bedding. All were killed by bite around the neck. Forensic evidence at the sites was consistent w/ fisher predation.

For Maine, w/ a pop maybe greater than 1000, why is incidental take in the trapping HCP so low? Jenn Vashon: MDIFW implemented measures we thought would reduce trapping injury and mortality leading up to the time we submitted the ITP application. We used the recommendations in the AFWA booklet and killer-type traps on a leaning pole 4 feet off the ground at a 45 degree angle. We believed that these measures would result in low mortality, thus a request of 3 lynx mortalities in traps over the next 15 years.

Question about pellet index vs live trapping of hares – Karen Hodges answered: pellet counts are proven to be robust & most reliable survey method to provide variance estimates; differences in methodology don't explain variation in survey results across range.

### **Resiliency Questions: Probability of Persistence Exercise**

1. What is the probability of persistence over time (particularly currently and at 2025, 2050, 2100) for each of the 6 major geographic units with lynx populations?

Response type: 3-point elicitation. What are the lowest probability, highest probability, and most likely probability of persistence? Experts were asked to connect the points through time to create a risk profile for each of the 6 geographic units.

- See Resilience expert response handout.

2. What are the major drivers/factors (up to 3) reducing or influencing probability of persistence for each of the major geographic units?

Response type: Ranked list of factors, for each point in time (2025, 2050, and 2100), with % contribution of each factor.

- See Resilience expert response handout.

### Conservation Brainstorming Exercise

3. What conservation actions could be taken that would address the factors impacting the probability of persistence or otherwise increase the probability of persistence?

Response type: Individual list with rounds responses. Experts were asked to each write their own list of conservation actions that could be taken. They were given 5 minutes for this task. Facilitators then asked one expert at a time to provide one item from their list, cycling through the set of experts until experts had exhausted their lists. Experts were given the opportunity to add items when it was their turn that had not been on their written lists.

List of top priority conservation actions:

Reduce CO2 emissions.

Continue protections associated w/ Federal and/or State listing.

Adjust forest management to retain spruce-fir and reduce fire burn rates.

Conserve/promote habitat connection w/ Canada populations through land use planning.

Management of salvage logging associated with fire and insect damage to facilitate/expedite conditions favorable to hares and lynx.

Configure and design lynx-friendly landscape at appropriate scales; maintain habitat mosaic.

Manage fuels-reduction (wildland fire) projects to maintain hare/lynx habitat features.

Population augmentation/reintroductions for currently small or extirpated populations (GYA, Kettle, etc.); bolster populations before future impacts.

Additional research to fill knowledge gaps (particularly related to conservation effects) – forest conditions that support hares, hare densities needed for lynx, range of habitat needed for lynx, unclear exactly what is needed for lynx across the range, viability, landscape hare densities, etc.

Cross border cooperation with Canada to increase near border populations, maintain connectivity.

Consider cumulative impacts of mining, ski areas, oil and gas, etc. in management decisions.

Promote reforestation of heavily-fragmented areas (WY, MN); reduce fragmentation.

Strategic habitat conservation, model and identify key areas and focus on those areas still in need of protection and management (e.g. private forest lands).

Maximize redundancy of lynx populations throughout the DPS.

Fire management BMPs, let burn in a way that creates high- and low-intensity mosaic fire pattern.

Is there a need for a consistent lynx (and hare?) monitoring strategy? Maybe could couple w/monitoring of other carnivores. Structured occupancy modeling with genetics sampling, could be very informative, and is cost effective. Known-fate monitoring. Monitoring pellet plots is proven and reliable way to monitor hares.

Could benefit from more funding specially devoted to mesocarnivores. Lynx are in worse shape than other carnivores that receive a lot of funding, have more secure populations, and will respond to climate change better.

### **Representation Questions –**

1. Are any of the populations susceptible to genetic drift on a scale that would limit genetic viability? If yes, which populations?

Response type: Experts supplied a written response of yes or no, with a yes answer accompanied by the list of populations.

- See Representation expert response handout.

2. Are there locations from a lynx perspective that have unique habitat conditions relative to other areas in the lynx range that are necessary to foster future adaptive capacity of the DPS? If yes, where?

Response Type: Open discussion.

- See Representation expert response handout.

Other things the experts thought we should consider –

Monitoring of prey base (hares, red squirrels) should be considered, would be very informative. Pellet based or mark recapture are most reliable methods. Need to sort out if these areas that we think are going to become poor habitat for a variety of reasons could still hold hares and lynx in the future. Maybe hares still can use areas we think will be poor habitat. Monitoring of these areas could help inform.

*[Participants are invited to provide additional notes in this section]*

MEETING ADJOURNED



**From:** Zelenak, Jim  
**To:** [Belleman, Ann](#)  
**Subject:** Re: Lynx status updates from the NE, NRM, and SRM populations  
**Date:** Wednesday, December 23, 2015 8:12:17 AM  
**Attachments:** [2015 11 24 LynxSSAExpertElicitationWorkshop-Notes.docx](#)  
[20151013 Lynx Expert Workshop Lynx in Maine Vashon.pdf](#)  
[20151013 Lynx Expert Workshop Lynx in WY and MT Squires.pdf](#)

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Hi Ann,

I don't have anything worked up on those specifically, but I've attached the DRAFT (not to be distributed) notes from the recent workshop in MN - see pages 8-12 for summaries of status update presentations. I've also attached PDFs of the presentations on those areas by the experts at the workshop (also not for distribution at this point). The Maine and MT/WY presentations are attached here. Will send CO/S. Rockies in separate email.

Hope these help. Let me know if you have questions or need anything else.

I'm in today then out until Jan. 2.

Happy Holidays!

Jim

On Wed, Dec 23, 2015 at 6:37 AM, Belleman, Ann <[ann\\_belleman@fws.gov](mailto:ann_belleman@fws.gov)> wrote:

Hi Jim,

Hope you're well! I'm looking for the above for a draft BiOp I'm finishing today and was wondering if you have a readily available document with such updates - I'm looking for brief summaries, maybe a couple of paragraphs.

I don't know if you're working today (Dec. 23rd) so if you aren't, then obviously you won't read this until next week. In that case, please ignore this, as Tam will be back next week too (she's off today).

Thanks and Happy Holidays!

Ann

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**From:** [Belleman, Ann](#)  
**To:** [Zelenak, Jim](#)  
**Subject:** Re: Lynx status updates from the NE, NRM, and SRM populations  
**Date:** Wednesday, December 23, 2015 9:27:30 AM

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OK, understood. Given all this info, I think I'll hold off from updating my lynx status section until I can confirm some usable info after the holidays. (A project draft BO is due today but it won't be complete, so I'll have to send v2 in early Jan. anyway.)

Happy holidays - Ann

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On Wed, Dec 23, 2015 at 10:16 AM, Zelenak, Jim <[jim\\_zelenak@fws.gov](mailto:jim_zelenak@fws.gov)> wrote:

I'd be leery of presenting the pop. "estimates" at all because they are not very robust. Mark says there are some pretty big assumptions in the State of Maine's estimate, and I'm not sure about John's estimates for the various MT pops. Jake and CPW admit that they really have no idea how many are in CO at the moment and that their passive monitoring probably will never generate a reliable estimate.

That said, feel free (and good luck, given the season) to try to contact Jen, John and/or Jake.

On Wed, Dec 23, 2015 at 9:06 AM, Belleman, Ann <[ann\\_belleman@fws.gov](mailto:ann_belleman@fws.gov)> wrote:

Thanks so much! I glanced at these and if I incorporate any very general updates (e.g., estimated pop. sizes), how should I cite the info? Or should I contact the individuals who presented for their permission, etc.?

I will not share any of this info or cite unless granted permission.

Ann

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