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APR 30 2003

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Subject: East Fork Crooked River Bridge Replacement Project, Idaho County, Idaho--Biological Opinion
File #106.0200 1-4-03-F-554 HUC #17060305

Dear Mr. Bernhardt:

This document transmits the Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed East Fork Crooked River Bridge Replacement Project located in Idaho County, Idaho, and its effects on the threatened Canada lynx (*Lynx canadensis*). Your December 4, 2002 letter requesting our concurrence on the effects of the proposed project on the Canada lynx was received in our office on December 9, 2002. This biological opinion was prepared in accordance with section 7 of the Endangered Species Act (16 U.S.C. 1531 *et seq.*).

As you may already know, the District Court for the District of Columbia issued an order on December 26, 2002, that enjoins the Service from issuing any "written concurrence[s]" that actions proposed by any Federal agencies "may affect, but are not likely to adversely affect" the threatened Canada lynx. Until further notice, all consultations concerning effects to the Canada lynx must be conducted in accordance with the direction of the Court. Specifically, any actions subject to consultation that may affect the Canada lynx require formal consultation as described in 50 CFR§ 402.14 and preparation of a biological opinion that addresses how the proposed action is expected to affect the Canada lynx in order to complete the procedural requirements of section 7 of the Endangered Species Act.

This biological opinion is based primarily on our review of your August 6, 2002 biological assessment regarding the effects of the proposed action on the Canada lynx. A complete administrative record of this consultation is on file at this office.

Consultation History

The North Central Idaho Level 1 team initiated discussions on the East Fork Crooked River Bridge Replacement project in June 2002. The team reached a preliminary agreement regarding

effects of the proposed action on lynx in November 2002. The Forest submitted a letter requesting concurrence on December 4, 2002 which was received by the Service on December 9, 2002. Prior to completing the letter of concurrence a court order dated December 26, 2002 enjoined the Service from concurring on *not likely to adversely affect* determinations for lynx. In a letter dated March 3, 2003 the Service, in addition to concurring with determinations for bull trout (*Salvelinus confluentus*) and gray wolf (*Canis lupus*), explained to the Forest the court ordered requirement to initiate formal consultation and prepare this biological opinion for lynx.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The action area for East Fork Crooked River Bridge Replacement Project (i.e., the area of direct and indirect effects) encompasses a 0.5 mile radius area around the bridge replacement site. It is expected that potential direct and indirect effects would occur at the actual bridge site, but disturbance effects may extend beyond the site.

The East Fork Crooked River Bridge Replacement Project occurs within the South Fork Clearwater subbasin, 4th Field Hydrologic Unit (HUC) #17060305 in the Red River Ranger District, Nez Perce National Forest, Idaho County, Idaho. The proposed action is to replace bridge No. 233-12.1 which spans the East Fork Crooked River near the confluence with the West Fork Crooked River, approximately 0.80 miles south of the town of Orogrande. It has been determined that the current 12-foot span bridge, built in 1949, requires improved structural capacity and hydrologic efficiency. The planned replacement bridge would span 40 to 42 feet and be constructed to accommodate a 100-year flood. Approaches to the replacement bridge will be hardened and surfaced with crushed rock which is predicted to decrease sediment delivery to the aquatic system. Project implementation would require approximately 16 to 32 hours of instream work and would affect approximately 50-70 linear feet of stream bank/channel including removal of some trees and shrubs (less than 0.05 acres).

STATUS OF THE SPECIES

Canada Lynx

The Canada lynx is a medium-sized cat whose historic range 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). A final rule listing a Distinct Population Segment of the Canada lynx as a threatened species in the contiguous United States was issued on March 24, 2000 (65 FR 16052). The final listing rule delineated four distinct regions of lynx distribution: the Northeast, Great Lakes, Southern Rocky mountains and Northern Rocky Mountains. Critical habitat has not been designated for this species.

Biology and Life History

Like most highly mobile carnivores, lynx select habitat by food availability (Sandell 1989), but suitability for denning and secure travel also are important habitat elements for lynx. Lynx are believed to benefit most from a landscape mosaic of young, mature, and old-growth forest. An optimal landscape is assumed to include an abundance of young, vigorously regenerating high-density lodgepole pine or spruce-fir forest foraging habitat interspersed with old-growth coniferous forest that provides denning and security habitat, as well as foraging opportunity for snowshoe hare and red squirrel. An effective habitat complex will be interconnected by a network of suitable travel corridors.

Home range size varies by the animal's gender, abundance of prey, season, and the density of lynx populations (Hatler 1988, Koehler 1990, Poole 1994, Slough and Mowat 1996, Aubry et al. 2000, Mowat et al. 2000). Female home ranges are largely governed by food distribution and denning habitat availability and suitability, while male home ranges reflect the distribution of females and food availability. Documented home ranges vary from 8 to 800 square kilometers (3 to 300 square miles) (Saunders 1963, Brand et al. 1976, Mech 1980, Parker et al. 1983, Koehler and Aubry 1994, Apps 2000, Mowat et al. 2000, Squires and Laurion 2000) with males generally maintaining larger home ranges (Sandell 1989, Koehler and Aubry 1994). Distribution of quality feeding, security, and denning habitat patches, and the availability of secure travel corridors between these patches determine the actual size and shape of a home range. 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).

Lynx are capable of dispersing extremely long distances (Mech 1977). Lynx disperse primarily when snowshoe hare populations decline (Ward and Krebs 1985, Koehler and Aubry 1994, O'Donoghue et al. 1997, Poole 1997) though subadult lynx disperse even when prey is abundant (Poole 1997), presumably as an innate response to establish home ranges.

During the early 1960s and 1970s, numerous occurrences of lynx in atypical habitat, such as in North Dakota, were documented. In those years, harvest returns indicated unprecedented cyclic lynx highs for the 20th century in Canada (Mech 1973, Thiel 1987, McKelvey et al. 2000a). Many of these unusual observations were probably dispersing animals that either were lost from the population or later returned to suitable habitat.

Diet

Lynx distribution and abundance appear to be closely associated with that of the snowshoe hare (*Lepus americanus*) (Koehler et al. 1979, Parker et al. 1983, Ward and Krebs 1985, Bailey et al. 1986, Koehler 1990, Koehler and Aubry 1994), the primary prey of lynx, comprising 35 - 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*, *Dendragopus* spp., *Lagopus* spp.), flying squirrel (*Glaucomys sabrinus*), ground squirrel (*Spermophilus parryii*, *S. Richardsonii*), porcupine (*Erethrizon dorsatum*), beaver (*Castor canadensis*), mice (*Peromyscus* spp.), voles (*Microtus* spp.), shrews (*Sorex* spp.), fish, and ungulates as carrion or

occasionally as prey (Saunders 1963, van Zyll de Jong 1966, Nellis et al. 1972, Brand et al. 1976, Brand and Keith 1979, Koehler 1990, O'Donoghue et al. 1998).

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, Koehler (1990) suggested that a diet of red squirrels alone might not be adequate to ensure lynx reproduction and survival of kittens.

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.

There has been little research on lynx diet specific to the southern portion of its range except in Washington (Koehler et al. 1979, Koehler 1990). Southern populations of lynx may prey on a wider diversity of species than northern populations because of lower than average hare densities and differences in small mammal communities. Differing interpretations of the population dynamics of southern populations of snowshoe hare have been proposed (Hodges 2000a). In areas characterized by patchy distribution of lynx habitat, lynx may prey opportunistically on other species that occur in adjacent habitats, potentially including white-tailed jackrabbit (*Lepus townsendii*), black-tailed jackrabbit (*Lepus californicus*), sage grouse (*Centrocercus urophasianus*), and Columbian sharp-tailed grouse *(Tympanichus phasianellus*) (Quinn and Parker 1987, Lewis and Wenger 1998).

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).

Primary forest types that support snowshoe hare are subalpine fir (*Abies lasiocarpa*), Englemann spruce (*Picea engelmannii*), Douglas-fir (*Pseudotsuga menziesii*), and lodgepole pine (*Pinus contorta*) 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 Aubry 1994). Snowshoe hares have evolved to survive in areas that receive deep snow (Bittner and Rongstad 1982). Generally, earlier successional forest stages have greater understory structure than do mature forests and, therefore, support higher hare densities (Hodges 2000a, 2000b). However, mature forests also can 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 (Buskirk et al. 2000).

Suitable habitats result from disturbances such as fire and disease, as well as from some types of timber harvesting. Following such disturbance, forests normally require 15 to 30 years before they reach a growth stage that again make them suitable as winter snowshoe hare habitat, and consequently important foraging habitat for lynx. Any forested habitats within the upper

montane and subalpine zones that support snowshoe hares or other available prey in significant quantities should be considered lynx foraging habitat. Habitat types other than those generally accepted as "lynx habitat" may at times be important to lynx for foraging. Sagebrush (*Artemisia* spp.) and Gambel oak (*Quercus gambelii*), for instance, may provide adequate concealment for lynx to travel and hunt successfully in many locations beyond forest edges.

Lynx seem to prefer to move through continuous forest, and particularly use the highest terrain available (such as ridges and saddles) that is near areas used by hares (Koehler 1990). Cover is important to lynx when searching for food (Brand et al. 1976), but lynx often hunt along edges (Mowat et al. 2000). Lynx have been observed (via snow tracking) to avoid large openings (Koehler 1990) during daily movements within the home range.

Den Site Selection

Lynx use 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, Ruediger, et al. 2000). 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. This structure must be available throughout the home range providing multiple quality den sites, because it is likely that these structures are used when the kittens are old enough to travel but not hunt (Bailey 1974). It is equally important that an abundance of high quality foraging habitat be available in close proximity to all den sites if they are to be functional.

The age of the forest stand does not seem as important as the amount of downed, woody debris available (Mowat et al. 2000). 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 Washington, lynx used lodgepole pine, *Picea* spp. (spruce), and 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).

Travel Corridors

Data indicate that lynx generally prefer to travel in forested or densely wooded habitats and they typically do not forage far from cover. Suitable travel cover may be defined as woody vegetation greater than 2 meters (6 feet) in height that supports a closed canopy (Koehler and Aubry 1994), including wooded riparian or other woody habitat types (e.g., sagebrush or Gambel oak). Information from more southern environments does indicate that lynx in fragmented habitats may be more willing to cross large openings than commonly believed. Lynx have been found to cross large open expanses such as shrub steppe and mountain grassland (Thompson and Halfpenny 1989).

Riparian corridors are likely important travel routes, as are ridges and saddles (Koehler 1990). The subalpine environments on the flanks of major mountain ranges in the Southern Rockies are typically separated by large and frequently rugged alpine zones which may be a barrier or filter to lynx movements. Forested connections across mountain divides in low, narrow saddles are scarce in the Southern Rockies and may be especially important for landscape connectivity, dispersal, and population interchange across mountain ranges.

Travel cover, to be useful, must connect quality foraging, denning, and security habitats within close proximity (i.e., normal daily hunting ranges). If extended, travel routes themselves should probably contain reasonably spaced foraging and security habitats. Connective travel corridors among habitat blocks may constitute crucially important habitat features. These connective corridors bind the ecosystem together, and their loss or degradation may destroy the ability of the landscape to function for wide-ranging forest carnivores, such as the lynx. Furthermore, at lower prey densities, lynx may abandon home ranges and become nomadic. This only increases the importance of quality travel corridors and a well interconnected landscape. In a nomadic state, lynx will require large interconnected habitats to fulfill their life cycle needs.

Recruitment

Breeding occurs through March and April in the north (Quinn and Parker 1987). Kittens are born in May to June in south central Yukon (Slough and Mowat 1996). Male lynx do not help with rearing young (Eisenberg 1986) and may be incapable of breeding during their first year (McCord and Cardoza 1982). However, Slough and Mowat (1996) reported yearling females giving birth during periods when hares were abundant.

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).

Koehler (1990) suggested that the low number of kittens produced in north central Washington was comparable to northern populations during periods of low snowshoe hare abundance. In his study area, radio-collared females (n=2) 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, only one kitten survived the first winter.

In Montana, Squires and Laurion (2000) reported that one marked female produced two kittens in 1998. In 1999, two of three females produced litters of two kittens each. In Wyoming (Squires and Laurion 2000), one female produced four kittens in 1998, but snow tracking indicated that the kittens were not with the female in November and presumed dead. 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, primarily fur trapping (Ward and Krebs 1985, Bailey et al. 1986).

In cyclic populations of the northern taiga, significant mortality due to starvation has been demonstrated 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.

Predation on lynx by mountain lion, coyote, wolverine (*Gulo gulo*), gray wolf (*Canis lupus*), bobcat (*Lynx rufus*), 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 and Laurion (2000) reported two of six mortalities of radio-collared lynx in Montana were due to mountain lion predation. To observe such events is rare, and the significance of predation on lynx populations is unknown.

Population Dynamics

In Canada and Alaska, lynx undergo extreme fluctuations in response to snowshoe hare population cycles, enlarging or dispersing from their home ranges and ceasing the recruitment of young into the population after hare populations decline (Mowat et al. 2000). In the southern portion of the range in the contiguous United States, lynx populations appear to be limited by the 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 the taiga during the low phase of the population cycle (Quinn and Parker 1987, Koehler 1990, Aubry et al. 2000). This is likely due to the naturally lower densities of hares and the patchy distribution of habitat in the contiguous United States.

A lack of accurate data hampers our understanding of lynx population dynamics in the contiguous United States and precludes drawing definitive conclusions about lynx population trends. Long-term trapping data have been used to estimate population trends for various species. However, trapping returns are strongly influenced by trapper effort, which varies between years and, therefore, may not accurately reflect population trends. Another important problem is that trapping records of many States did not differentiate between bobcats and lynx, referring to both as "lynxcats." Other types of surveys designed specifically for lynx have rarely been 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. 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. 2000a).

Lynx populations in the contiguous United States occur at the southern periphery of a 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). Lynx population dynamics may emanate from the core to the periphery, as evidenced by a lagged correlation of lynx trap records and observations (McKelvey et al. 2000b, Mowat et al. 2000). 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.

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. 2000b). Other areas may function as sinks, where lynx mortality is greater than recruitment and 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).

Efforts to Conserve Lynx

In response to the emerging awareness of the uncertain status of Canada lynx populations and habitat in the coterminous United States and the onset of the listing process, an interagency Canada lynx coordination effort was initiated in March 1998. The Service, Forest Service (USFS), Bureau of Land Management, and National Park Service have participated in this effort. Three products have been produced: Ecology and Conservation of Lynx in the Unites States (Ruggiero et al. 2000), the Canada Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000), and Lynx Conservation Agreements (CA) between the Service and various land management agencies. The National Park Service is currently developing a CA with the Service for Canada lynx that was completed in draft form in the second quarter of 2000. That agreement will promote the conservation of Canada lynx and its habitat in the national parks and identify actions the National Park Service agrees to take to reduce or eliminate potential adverse effects or risks to Canada lynx and their habitat.

Status and Distribution

The lynx's present and historical distributions reflect a strong association with the boreal forest (McCord and Cardoza 1982, Nowak and Paradiso 1983, Quinn and Parker 1987, Koehler and Aubry 1994). Historically, lynx inhabited forested landscapes in Alaska, across Canada south to the Cascade Range of Washington and Oregon, the Rocky Mountains of Utah and Colorado, the Great Lakes States, the extreme northeastern United States, and east to insular Newfoundland (McCord and Cardoza 1982, Koehler and Aubry 1994). This historical distribution closely matches that of the lynx's primary prey, the snowshoe hare. Within the contiguous 48 States, viable populations of lynx may now exist only in Washington and Montana. Small populations of unknown size and viability are known to exist in Maine, Wyoming, and Idaho. Lynx also may

continue to persist at very low numbers in the States of Minnesota, Michigan, Wisconsin, Oregon, Utah, and Colorado. The State of Colorado has initiated a program to reestablish lynx. The apparent widespread decline and possible regional extirpation of lynx populations in the contiguous United States has been linked to historical overtrapping, changes in forest structure as a result of past and current management practices, habitat fragmentation, and land use changes. The State of Colorado listed the lynx as a State endangered species in 1976 (Colorado Division of Wildlife et al. 1997).

Northern Rocky Mountains Region

Both Montana and Idaho classify the Canada lynx as a furbearer, but no longer allow trapping. In Idaho, a 1990 survey indicated that the population was stable or declining (Service 1998a, b). Recent confirmed records are scarce and the Canada lynx is considered rare. The Montana Department of Fish, Wildlife and Parks estimated the Canada lynx population at 1,040 animals in 1994 and the Service considers the Canada lynx to be resident in that state (Service 1998b).

In Wyoming, the Canada lynx has been protected as a non-game species with no open season since 1973. It is considered rare (Service 1998a, b) in the state and has been documented in the Wind River and Wyoming Mountain Ranges. The Canada lynx is classified as a Species of Special Concern by the Wyoming Department of Game and Fish (Ruediger et al. 2000), indicating that habitat is limited and populations are restricted or declining.

In the northern Rocky Mountains, the majority of lynx occurrences are associated within Rocky Mountain Conifer Forest, within this type, most of the occurrences are in moist Douglas fir (*Pseudotsuga menziesii*) and western spruce/fir forest. Most of the lynx occurrences are in the 1,500-2,000 meter (4,920-6,560 feet) elevation class (McKelvey et al. 2000a). These habitats are found in the Rocky Mountains of Montana, Idaho, eastern Washington, Utah, and the Cascade Mountains in Washington and Oregon.

According to Rust (1946), lynx were not abundant but were distributed throughout northern Idaho in the early 1940s, occurring in eight of the ten northern and north-central counties. McKelvey et al. (2000a) located a number of lynx specimen records from Idaho collected during the early 1900s. Anecdotal reports compiled by Lewis and Wenger (1998) indicated the occurrence of lynx in atypical habitats. In accordance with the interagency LCAS (Ruediger et al. 2000), the Service, Bureau of Land Management, and Forest Service have cooperated to identify lynx analysis units (LAUs) in Idaho where suitable habitat for lynx is present. These LAUs encompass forested lands that meet vegetation characteristics and elevation limits described in the LCAS, and they extend from the northern panhandle of Idaho to the Snake River plain in the south, east to the Wyoming boundary.

In Wyoming, Canada lynx occur primarily in spruce-fir and lodgepole pine forests with 8 to12 degree slopes, at elevations between 7,995 and 9,636 feet (Ruediger et al. 2000). Quaking aspen (*Populus tremuloides*) stands and forest edges, as well as open grass meadows and forest ecotones, may also support high numbers of hares and Canada lynx. On a landscape scale, Canada lynx habitat includes a mosaic of early seral stages that support snowshoe hare populations and late seral stages of dense old growth forest that provide ideal denning and

security habitat. Connectivity between Canada lynx populations is critical: dispersal corridors should be several miles wide with only narrow gaps. Large tracts of continuous coniferous forest are the most desirable for Canada lynx travel and dispersal.

Southern Rocky Mountains Region

The Canada lynx is an indigenous carnivore of the Southern Rocky Mountains. Climatic warming after the last continental glaciation caused a northward retreat of the boreal forest, isolating a remnant boreal forest ecosystem in the higher elevations of the Southern Rocky Mountains from the rest of the Rocky Mountains and the northern boreal forest (Armstrong 1972, Fitzgerald et al. 1994). Concurrently, this isolated Southern Rockies populations of boreal forest species, including the Canada lynx. Thousands of years of isolation from other lynx populations leads to the implication that lynx in the Southern Rockies have been self-sustaining until this century.

The cumulative body of evidence indicates the Canada lynx was probably comparatively common in the Southern Rockies through at least the first quarter of the 20th century. Merrit Cary's report (1911) of a biological survey for Colorado also leads the reader to believe that lynx may have been relatively common in Colorado, at least near or prior to the turn of the century. Records of the U.S. Bureau of Biological Survey show that lynx were taken on the Routt National Forest in northern Colorado between the years of 1914-1922, ranging from 83 individuals in 1914 and 1915, to 210 in 1916. In 1923, 97 lynx were reported taken at trap and poison stations across Colorado by the Biological Survey.

Records of lynx occurrence are available from throughout most of the Southern Rocky Mountains. The last specimens of lynx taken in the Southern Rockies were from the late 1960s and early 1970s. In 1971, the State of Colorado closed the season on lynx, making it illegal to take this species. Since then, only a few specimens have been obtained. In 1972, a lynx was trapped on Guanella Pass and another caught in a snowslide east of Bakerville, both in Clear Creek County. During the 1973-74 winter, a pair of lynx was illegally trapped within Vail Ski Area boundaries (Thompson and Halfpenny 1989). No lynx specimens are available since those last illegal takes.

Despite the resulting lack of recent specimens, strong evidence of lynx persistence continued to surface. A Statewide lynx verification program conducted from 1978-80 by the Colorado Division of Wildlife (CDOW) concluded that viable, low-density lynx populations persisted in Eagle, Pitkin, Lake, and Clear Creek Counties (Halfpenny and Miller 1981). Because Summit County is sandwiched between three of those counties, it is likely that lynx existed there as well. In addition, the program provided evidence of lynx occurrence in Grand and Park Counties. Lack of evidence from other portions of the State was as likely a consequence of survey effort as lack of lynx.

Thompson and Halfpenny (1989) confirmed lynx in the vicinity of Vail Ski Area during the 1988-89 winter as part of studies conducted by Vail Associates for the Category III expansion. They state in their report, "There is no question that lynx exist at Vail Ski Area and in the

surrounding mountains." Follow-up work by CDOW in 1990 and 1991 lead to the discovery of additional lynx tracks in the area.

Occasional credible sighting reports and track evidence continue to be received from various parts of the State, providing additional evidence that native lynx likely still persist in low numbers in the Southern Rockies. Since the 1991 track discoveries near Vail and in the San Juans, CDOW has recorded seven lynx sightings or track locations between 1992 and 1998 that they rate as probable lynx. Three of those were by CDOW biologists. Tom Beck, a carnivore researcher with CDOW, found a set of lynx tracks in the Dolores River drainage in the west San Juans, Montezuma County in 1993. A CDOW Area Wildlife Manager observed a lynx in the southern Sangre de Cristos of Costilla County, also in 1993. Two sightings and one set of tracks were reported from Eagle County and another set of tracks was located in Larimer County north of Rocky Mountain National Park.

In 1997, photographs were taken of tracks believed to be those of lynx in the Tennessee Creek drainage on the border of Lake and Eagle Counties. This is an area where possible lynx tracks were located just a few years earlier. Among the most recent credible sighting reports include one from Boreas Pass on the border of Summit and Park Counties in 1995, another from the Vail vicinity in January 1998, one from a Forest Service biologist in July 1998 on the Flattops in northwestern Colorado, and from a Park Ranger in Rocky Mountain National Park (Larimer County) in December 1998. This location was in the same general area where Thompson and Halfpenny located lynx tracks in 1991.

The CDOW has conducted several surveys in the past 2 decades, with little success. Though failing to confirm lynx presence, they did locate several sets of possible lynx tracks. Although these surveys generally have not provided the systematic coverage, repetition, and intensity necessary to make conclusions about population persistence or numbers, they have resulted in sufficient effort to conclude that native lynx are at this time apparently rare in the Southern Rockies. Biologists in Colorado are in general agreement that regardless of the actual number of native lynx, it is now likely that number may be below the critical threshold of population viability (i.e., that populations are of sufficient size to be self-sustaining in the long-term).

Based on this conclusion, CDOW initiated a recovery program in February 1999. That program augmented any existing populations with transplants from Canada and Alaska, with the intent of reestablishing viable, self-sustaining populations in primary blocks of suitable habitat throughout the Southern Rocky Mountains. Ninety-six lynx were released in the San Juan Mountains during the winter/spring periods of 1999 and 2000. Most of these remaining lynx are currently known to occupy the San Juan mountains. A number of lynx have made and continue to make exploratory movements throughout the Southern Rockies. Several animals have taken up residence for extended periods in the central and northern mountains. Currently, lynx may exist in most major portions of the Southern Rockies Ecosystem. The State of Colorado has proposed augmenting an additional 180 Canada lynx into the State over the next several years.

Great Lakes Region

Minnesota has a substantial number of historical lynx reports, primarily trapping records and primarily from northeastern counties (Mech 1980, McKelvey et al. 2000a). It remains unexplained how many of these records represented local residents or dispersing lynx (McKelvey et al. 2000a). Historically lynx were trapped in Minnesota through both population highs and lows, indicating that at least some animals may have persisted in a core resident population. Lynx habitat in northeastern Minnesota is contiguous with boreal forest lynx habitat in Ontario and hence, the continental lynx population. Henderson (1978), Mech (1980), McKelvey et al. (2000a) suggested that the harvest peaks were influenced by influxes of lynx from Canada. Because lynx numbers did not increase in the early 1980s on the expected 10-year cycle (very few were harvested or reported observed) the lynx season was closed in 1984.

The Minnesota harvest trends are consistent with cyclical patterns in Ontario lynx harvest data. Ontario harvest was then especially low in the 1990s "peak" (only one-fifth the 1972-73 harvest) following a period of very high prices for lynx pelts. The pattern of steeply declining peaks in the lynx harvest recorded from the 1970s to the 1990s in Ontario, however, occurred on a similar scale from the 1920s to the 1940s when fur prices were consistently much lower. Thus, the causes for reduced lynx harvests and likely abundance in Ontario in the early 1990s remain unexplained—as does the lack of anticipated lynx observation records in Minnesota in the early 1980s and 1990s. Snowshoe hare harvest data (the only available long-term index to hare abundance in Minnesota) show a very inconsistent pattern from 1941-2000. Hare abundance as indicated by harvests peaked in the early 1940s and 1950s along with lynx harvests, but not in the early 1950s or 1960s. In contrast, hare harvest was double any previous year from 1977-1980 yet lynx did not increase. Hares remained at relatively low densities through the 1990s. At least in recent decades, lynx dynamics in the Great Lakes region may have been influenced more by immigration than local hare cycles (McKelvey et al. 2000a). The role that changes in forest disturbance patterns (fire, blowdown, timber harvest) have had on Minnesota hare populations has not been studied.

Lynx are known to have reproduced in Minnesota during higher abundance phases in the 1970s (Mech 1973; 1980). Currently, lynx are thought to be experiencing a population peak in northeastern Minnesota. While recent records, including kitten observations, resolve that lynx are again reproducing and resident in Minnesota, the question of whether the population has previously or will in the future persist in Minnesota through cyclical population declines is uncertain. Regardless of whether lynx are consistently resident in Minnesota, largely represent Canadian immigrants, or both, the animals here are part of the broader population that extends northward in Ontario and the rest of the boreal forest.

Northeast Region

In the northeastern United States, Canada lynx occurred historically in the boreal deciduous forest ecotone from Pennsylvania northeast through New York, Massachusetts, Vermont, New Hampshire and Maine. Lynx are currently extirpated throughout much of this range (Pennsylvania, New York, and Vermont, and possibly New Hampshire) except for Maine where a population of several hundred animals exists in the northern part of the state. The Maine

population is contiguous with lynx populations in southern Quebec and New Brunswick, and Nova Scotia. The St. Lawrence River likely isolates the Northeast lynx population from those in the interior of Quebec.

Both Pennsylvania and Massachusetts are located at the southernmost extent of the historic range of lynx in the Northeast (Hall 1971). Lynx are considered extirpated in these states. Historically, dispersing or perhaps resident animals may have lived in coniferous forests at higher elevations.

In New York, the lynx is currently classified as a small game species with a closed season, but generally thought to be extirpated in the State. Most historic records are from northern New York, particularly in the Adirondack and Catskill Mountains (McKelvey et al. 2000). The most recent verified record in New York (excluding a failed reintroduction attempt in 1980) was in 1973 (McKelvey et al. 2000).

There are only four verified historic records of lynx in Vermont, the latest being in 1968 (McKelvey et al. 2000). There is no record that a breeding population occurred there (Service 2000). The lynx is classified as extirpated in Vermont and state-listed as endangered in 1972.

New Hampshire maintained a bounty and trapping season for lynx until 1965 when the season was closed in response to apparent declines in lynx abundance (Siegler 1971, Litvaitis et al. 1991). In 1980 the lynx was listed as endangered. Winter track surveys in the White Mountain National Forest in 1986 did not detect lynx (Litvaitis et al. 1991), and lynx were believed to be extirpated. Only two reports of lynx exist for the 1990s (Service 2000). No surveys have been completed in New Hampshire in recent years. However, lynx could occur in the state (they occur in adjacent towns in Maine).

Maine's lynx population is contiguous with populations south of the St. Lawrence River (southern Quebec, Gaspe Peninsula, and northwestern New Brunswick). A population of lynx has persisted in Maine throughout during historic times. Historically, lynx ranged statewide, but their range contracted in the 1900s primarily to western and northern parts of the state. Range contraction is believed to be caused by changing habitat, climate, and carnivore community. Historic data suggested lynx populations fluctuated widely. For example, during the Civil War (1864-65) a Maine fur dealer (Hardy 1897), purchased "several hundred" pelts annually, followed by a few years with no skins, then several years of 200 lynx hides. At least 30 lynx were bountied between 1833-1967, when the bounty was ended. Maine Department of Inland Fisheries and Wildlife (MDIFW) classified lynx as a furbearer with no open season and a species of Special Concern (although lynx was proposed for threatened status in 1987).

Although no reliable population estimates exist, it is thought that 200 to 500 animals could occur statewide. Verified track reports are compiled by MDIFW. These data suggest that lynx are currently more abundant than at any other time in recent decades.

In New Brunswick, bounties were paid from 1898-1961. Lynx have been listed as endangered in the province since 1976. During 1996 revisions it was categorized as a "regionally endangered species" (Cumberland et al. 1998). Populations are believed to be concentrated in

the northwest portion of the province. A 1998-99 snow track survey show lynx to be "fairly abundant" near the Maine border.

In Quebec, lynx have been listed as a species "likely to be listed as threatened or vulnerable" since 1992. They are abundant and widespread north of the St. Lawrence River and the eastern two-thirds of the Gaspe Peninsula. They are absent in the eastern townships and the St. Lawrence Valley (north and west of Maine). Quebec has instituted a harvest quota based on closing the season during the three year low in the snowshoe hare cycle, and lynx trapping was closed from 1995-97. This peak harvest coincided with high snowshoe hare densities observed throughout the Gaspe and northern Maine. The river freezes in the winter, but an ice-free shipping lane is maintained that discourages dispersing carnivores (Harrison and Chapin 1998).

The lynx was listed as threatened by Nova Scotia in 2002. Lynx have been absent from the mainland since the 1950s and are currently confined as an isolated population on Cape Breton Island.

Home range size for Maine lynx are comparable with ranges in Alaska and Canada during the low phase of snowshoe hare cycles (Koehler and Aubrey 1994) and smaller than lynx home ranges measured in the western U.S. (Apps 2000, Squires and Laurion 2000). Home ranges of females overlap broadly with each other and those of males. Lynx in Maine and eastern Canada are more closely associated with areas of deep snow (>268 cm) with relatively little deciduous forest, and large patches of regenerating forest where snowshoe hares are likely to be abundant.

Current habitat conditions and snowshoe hare densities seem near optimal for lynx throughout much of northern Maine. Large areas of northern Maine were clearcut in the 1980s to salvage spruce and fir stands damaged by spruce budworm. Today, these young stands support high densities of snowshoe hares. Negative public response to clearcutting resulted in passage of the Maine Forest Practices Act of 1999, and silvicultural practices have changed dramatically. Forest management companies have shifted from >90 clearcutting (1980s) to >90% partial cutting (2000's). This silvicultural trend will likely result in reduced snowshoe hare populations and diminished habitat quality for lynx in Maine and likely represents the greatest threat to recovery of this species in this region. Northern Maine contains large tracts of undeveloped land with potential for supporting lynx. Working with forest landowners and the public to encourage silvicultural practices that provide numerous, large patches of young, regenerating spruce-fir stands that support high snowshoe hare populations is key to lynx recovery in the Northeast.

ENVIRONMENTAL BASELINE

The environmental baseline is defined as the past and present impacts on the Canada lynx of all Federal, state or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early Section 7 consultation, and the impacts of State or private actions that are contemporaneous with the consultation in process. The action area for the purposes of this analysis is defined as all lynx habitat within 0.5 mile of the project site. Any lynx that may occupy the action area during project implementation could potentially be disturbed by project activities.

According to the biological assessment, lynx have been observed 11 times within 25 miles of the project site between 1972 and 2002 (Figure 1). The majority of these observations are unconfirmed. A confirmed observation was made at Earthquake Basin (#9 Figure 1).

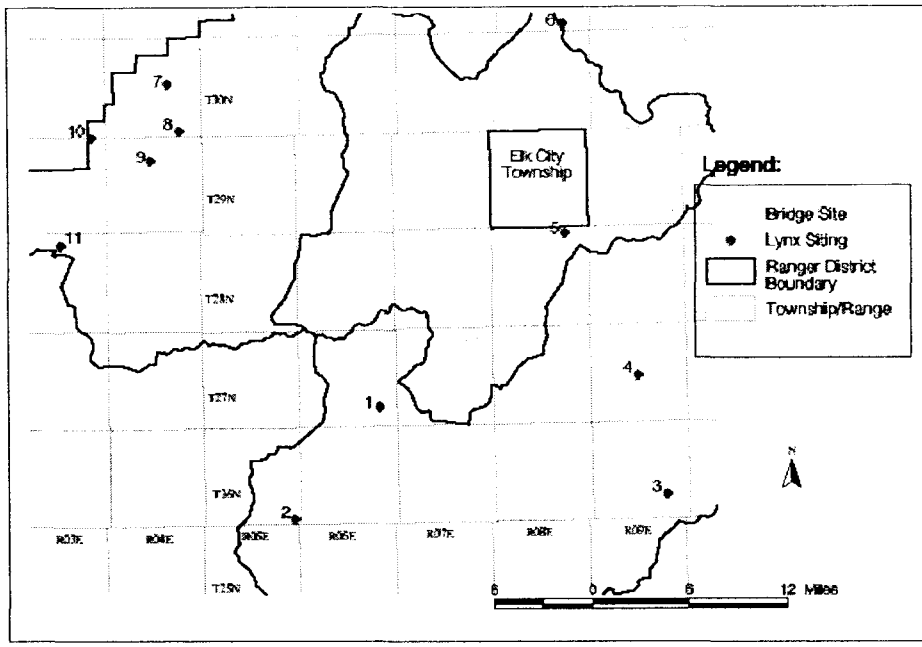

Figure 1. Lynx sighting information from the Idaho Conservation Data Center (CDC) in approximate relation to the East Fork Crooked River Bridge Replacement Project (provided by S. Seim, Nez Perce National Forest).

The project site is located within a forested community at 4,600 feet elevation at the boundary between two Lynx Analysis Units (LAUs), the Orogrande LAU and the Wild Horse LAU (Table 1). The LCAS guides analysis of effects at the LAU level as these units are intended to provide the fundamental or smallest scale with which to begin evaluation and monitoring of the effects of management actions on lynx habitat (see page 7-2 in the LCAS) (Ruediger et al. 2000). As shown in Table 1 both LAUs are above the 10 percent threshold for denning habitat recommended by the LCAS. The Wild Horse LAU with 81 percent suitable habitat is above the 70 percent threshold stated in the LCAS while the Orogrande LAU at 69 percent is just below threshold.

Table 1. Lynx Analysis Units in project area showing name, total acreage, percent suitable, unsuitable, and denning based on Nez Perce National Forest lynx habitat mapping.

Lynx Analysis Unit	Total Acreage	Percent Suitable	Percent Unsuitable	Percent Denning
Orogrande	22,744	69	31	40
Wild Horse	21,646	81	19	17

Past and present factors affecting the species within the action area (i.e., the bridge site and immediate area surrounding the site) include direct human-induced disturbance to lynx from winter and summer recreation and land management activities. Direct mortality may be associated with hunting and trapping in addition to mortality from increasing levels of automobile traffic. There may be increased competition from coyotes and mountain lions for prey particularly during the winter as a result of human activities such as snow plowing and snowmobile trail grooming that may allow these species to access areas previously only accessible to lynx. Loss and fragmentation of lynx habitat from timber harvest and prescribed burning may also be affecting lynx.

EFFECTS OF THE ACTION

Direct and Indirect Effects

As mentioned previously, the project site is located at the boundary of the Wildhorse and Orogrande LAUs. The Wildhorse LAU is above the 70 percent threshold for suitable habitat while the Orogrande LAU is just below at 69 percent. Project vegetation treatments involve removal of less than 0.05 acres of brush and trees at the bridge replacement site. In a worst case scenario, if the total amount of vegetation removed was all located within one of the LAUs, less then 0.0002 percent of lynx habitat in the subject LAU would be affected. The direct effect to lynx habitat through this small amount of vegetation treatment will not measurably affect available lynx habitat in the action area and can therefore be considered insignificant. Because only a few trees and shrubs in the immediate vicinity of the bridge site will be removed no direct effects to lynx denning or foraging habitat or snowshoe hare populations from project implementation are expected. There are no documented occurrences of lynx within the action area, therefore the probability of project related activities disturbing individual lynx is discountable. Additionally, suitable lynx habitat is abundantly available outside of the action area, and therefore any lynx present will not be precluded from seeking refuge away from project activities. The proposed project is scheduled to be implemented in March 2004 which is outside of the critical denning period of May through August therefore no adverse effects to denning lynx are expected.

Potential indirect effects associated with project implementation, such as increased vehicle traffic in the area or additional road building are not expected to occur, therefore, potential indirect effects to lynx and lynx habitat are considered discountable.

Effects of Interrelated or Interdependent Actions

The Service has not identified any actions that are interrelated or interdependent to the proposed project.

CUMULATIVE EFFECTS

Cumulative effects are the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this 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 Act.

The Service has not identified any cumulative effects associated with implementation of the East Fork Crooked River Bridge Replacement Project.

CONCLUSION

After reviewing the current status of the Canada lynx, the environmental baseline for the action area, the effects of the action, and the cumulative effects, it is the Service's biological opinion that the East Fork Crooked River Bridge Replacement Project is not likely to jeopardize the continued existence of the Canada lynx. No critical habitat has been designated for this species, therefore, none will be affected.

The Service reached this conclusion because the effects to lynx from implementation of the East Fork Crooked River Bridge Replacement Project are insignificant and discountable. An insignificant amount of lynx habitat may be affected from project implementation as only 0.05 acres of vegetation will be removed in the immediate vicinity of the bridge site. Individual lynx that may be present in the action area during implementation may be disturbed by project related noise and human activity but this effect is discountable because of the low probability of lynx occurring in the action area (no lynx have been documented in or near the action area) and because the project effects are short term (project is expected to be completed within a two week period). No lynx dens have been documented in the action area. Lynx that may potentially be denning in the action area would not be affected by project implementation because work is scheduled for completion outside of the identified critical denning period of May through August.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act 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 by the Service 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 by the Service 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 Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Amount or Extent of Take

No incidental take is anticipated.

Effect of the Take

Since no incidental take is anticipated, take will not affect lynx.

Reasonable and Prudent Measures

Since no incidental take is anticipated, no Reasonable and Prudent Measures are necessary.

Terms and Conditions

Since no incidental take is anticipated, no Terms and Conditions are necessary.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act requires Federal Agencies to utilize their authorities to further the purposes of the Act 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 plans, or to develop information. The Service recommends that the Forest implement the following conservation measures.

1. Conduct surveys for lynx and prey species, particularly snowshoe hare, in order to contribute information on lynx distribution and ecology on the Forest.

2. Refine lynx habitat maps by ground truthing habitat conditions on a case by case basis within project areas.

3. To facilitate analysis of proposed projects, post lynx GIS habitat maps and accompanying metadata on the Forest website in manner similar to what other Forests have done (e.g., the Clearwater National Forest).

REINITIATION NOTICE

This concludes consultation for the potential effects of the East Fork Crooked River Bridge Replacement Project on the Canada lynx. 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 maintained (or is authorized by law) and if: (1) the amount or extent of incidental 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 that was 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.

Thank you for your continued interest in the conservation of endangered, threatened, and proposed species. If you have any questions or comments, please contact Clay Fletcher of my staff at (208) 378-5256.

Sincerely,

Supervisor
Snake River Fish and Wildlife Office

Enclosure

cc: FWS-RO, Portland (Salata)

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