Mr. Mark Van Every
District Ranger
Kawishiwi Ranger District
118 S. 4th Ave E
Ely, Minnesota 55731

Dear Mr. Van Every:

This document transmits the U.S. Fish and Wildlife Service's (Service) final biological opinion based on our review of the biological assessment (BA) for the 2003 Kawishiwi Mineral Projects, Kawishiwi Ranger District, Superior National Forest, and their effects on the threatened Canada lynx (*Lynx canadensis*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C., 1531 et seq.). The Forest Service transmitted the BA for this project on September 10, 2003, and requested Service concurrence with a "may affect but not likely to adversely affect" determination. A complete administrative record of this consultation is on file in this office.

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 Canada lynx. Until further notice, all consultations concerning effects to Canada lynx must be conducted in accordance with the direction of the Court. Specifically, any actions subject to consultation that may affect Canada lynx require formal consultation as described in 50 CFR 402.14. This requires the preparation of a biological opinion that addresses how the proposed action is expected to affect Canada lynx in order to complete the procedural requirements of section 7 of the Act.

Your BA also assessed the effects of the 2003 Kawishiwi Minerals Projects on the bald eagle (*Haliaeetus leucocephalus*) and the gray wolf (*Canis lupus*). We concur with your determination in the biological assessment concluding that the proposed project will have no effect on the federally threatened bald eagle, as there are no known eagle territories or suitable foraging lakes within 1.5 miles of the project areas. Additionally, we concur that this project may affect but will not likely adversely affect the federally threatened gray wolf or adversely modify gray wolf critical habitat. Our concurrence is based on your recommendations for removing, avoiding, or compensating for any adverse effects through compliance with the road density and accessibility threshold for Wolf Management Zones 1 and 2 as defined in the Eastern Timber Wolf Recovery Plan (U.S. Fish and Wildlife Service 1992) and reinitiating consultation in the event that wolf rendezvous or den sites or bald eagle nests are discovered in the action area. These species will not be considered further in the attached biological opinion.

Consultation History

On September 10, 2003, Kawishiwi District biologist Susan Catton transmitted to the Twin Cities Ecological Services Field Office a BA for the 2003 Kawishiwi Minerals Projects in the Kawishiwi Ranger District. The analysis provided in the biological assessment, email transmissions, and telephone discussions with Kawishiwi District biologist Catton form the basis for this consultation.

If you have any questions or comments on this biological opinion, please contact Ms. Susan Rogers, Fish and Wildlife Biologist, at 612-725-3548 ext 219.

Sincerely,

Dan P. Stinnett
Field Supervisor

enclosure

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed projects are located in Lake County, Minnesota, and involve two mineral exploration proposals. Activities associated with these proposals include the clearing of drilling sites, opening closed roads, and creating new roads.

The Encampment-South Filson Creek Diamond Drilling Project is located in T62N, R11W, Section 25, approximately 10 miles south of Ely. Nine holes for exploration sampling would be drilled over about eight weeks beginning in February 2004. Access to the site would be via County Road 23 and Forest Road 181F (OML 1; currently closed). Approximately 1.5 miles of currently closed roads (both Forest Service system roads and unclassified) would be reopened for the project, and an additional one mile would be constructed. Each of the nine drill sites could have up to 22,500 ft^2 (0.5 acre) of disturbance, although the expected disturbance area at each site likely would be closer to 2,500 ft^2 (0.06 acre). Construction of the road and clearing of the drill sites would occur in various habitat types (including mature upland aspen, mature pine, upland grass openings, and lowland black spruce, tamarack, and brush) and on Forest Service land as well as a portion owned by the Minnesota Department of Natural Resources (MNDNR). Both the newly constructed road and the reopened road will be closed after use by berms, gates, and disguise of the visible portion. The effectiveness of this closure would be monitored and a report would be provided to the Service after one year.

The Lehmann-Chow Lake Project is located in T60N, R11W, Sections 3 and 10, approximately 15 miles south of Ely. One hole would be drilled in February 2004 and work would be completed within two weeks. Access to the site includes Forest Road 242 (currently plowed in winter) and existing temporary timber roads; approximately 300 ft of new skid trail would be constructed through a seven-year-old aspen clearcut and an area clearcut in summer 2003. The area cleared for the drill site would be approximately 2,500 ft^2 (0.06 acre) and was clearcut in summer 2003. After completion of activities, the hole would be sealed and the access road would be restored through grading and re-seeding. As above, the effectiveness of the closure would be monitored and a report would be provided to the Service after one year.

STATUS OF THE SPECIES

Species Description

The lynx is a medium-sized cat with long legs; large, well-furred paws; long tufts on the ears; and a short tail whose tip is entirely surrounded by black (McCord and Cardoza 1982); the tips of

bobcat tails are black only on the upper side. The lynx's long legs and large, well-furred paws make it highly adapted for hunting in deep snow.

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 10 kilograms (22 pounds) in weight and 85 centimeters (33.5 inches) in length (head to tail), and females average 8.5 kilograms (19 pounds) and 82 centimeters (32 inches, Quinn and Parker 1987).

Classification of the Canada lynx (also called the North American lynx) has been subject to revision. In accordance with Wilson and Reeder (1993), the lynx in North America is *Lynx canadensis*. Previously the Latin name *L. lynx canadensis* was used for lynx (S. Williams, Texas Tech University, pers. comm. 1994). Other scientific names still in use include *Felis lynx* or *F. lynx canadensis* (Jones et al. 1986; Tumlison 1987).

In 1998, the lynx was proposed for listing as a threatened species under the Act (63 FR, July 8, 1998). The lynx in the contiguous U.S. were listed as threatened effective April 23, 2000 (65 FR 16052, March 24, 2000). The Service identified one distinct population segment in the lower 48 states. No critical habitat has been designated for the threatened population of Canada lynx in the contiguous United States. As explained in the final rule (65 FR 16052, March 24, 2000), designation of critical habitat would be prudent but has been deferred until other higher priority work can be completed within the Service's current budget.

Life History

Lynx evidently require large areas containing boreal forest[1] habitat. In the northeastern U.S., lynx were most likely to occur in areas containing suitable habitat that were greater than 100 square kilometers (km^2) (40 square miles (mi^2)) (Hoving 2001). The requirement for large areas also is demonstrated by home ranges that encompass many square miles. The size of lynx home ranges varies with sex, age, 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). Based on a limited number of studies in southern boreal forest, the average home range is 151 km^2 (58 mi^2) and 72 km^2 (28 mi^2) for males and females, respectively (Aubry et al. 2000). Recent home range estimates from Maine are 70 km^2 (27 mi^2) for males and 52 km^2 (20 mi^2) for females (G. Matula, in litt. 2003). Documented home ranges in both the southern and northern boreal forest, however, vary widely from 8 to 800 km^2 (3 to 300 mi^2) (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; Squires et al. 2001; G. Matula, in litt. 2003). Generally, it is believed that larger home ranges, such as have been documented in some areas in the southern

[1] The term ''boreal forest'' broadly encompasses most of the vegetative descriptions of this transitional forest type that makes up lynx habitat in the contiguous U.S. (Agee 2000).

extent of the species' range in the west, are a response to lower-density snowshoe hare populations (Koehler and Aubry 1994; Apps 2000; Squires and Laurion 2000).

Long-distance movements {greater than 100 kilometers (km) [60 miles (mi)]} are characteristic of lynx (Mowat et al. 2000). Lynx disperse primarily when snowshoe hare populations decline (Ward and Krebs 1985; Koehler and Aubry 1994; O'Donoghue et al. 1997; Poole 1997). Subadult lynx also disperse even when prey is abundant (Poole 1997), presumably as an innate response to establish home ranges. Lynx also make exploratory movements outside their home ranges (Squires et al. 2001). Lynx are capable of moving extremely long distances [greater than 500 km (300 mi)] (Mech 1977; Brainerd 1985; Washington Department of Wildlife 1993; Poole 1997; Mowat et al. 2000; Squires et al. 2001).

Snowshoe hares are the primary prey of lynx, especially in the winter when they comprise 35-97 percent of the diet throughout the range of the lynx (Koehler and Aubry 1994). Other prey species include red squirrel (*Tamiasciurus hudsonicus*), other small mammals, and birds; lynx also eat carrion and, uncommonly, large mammals such as deer (*Odocoileus virginianus*), moose (*Alces alces*), and caribou (*Rangifer tarandus*) (Saunders 1963; van Zyll de Jong 1966; Nellis et al. 1972; Brand et al. 1976; Brand and Keith 1979; Quinn and Parker 1987; Koehler 1990; Staples 1995; O'Donoghue et al. 1998a, b). When hare densities decline due to reduced availability of high-quality food, birthrates and litter sizes of female lynx and survival of kittens decrease (Nellis et al. 1972; Brand et al. 1976; Brand and Keith 1979; Poole 1994; Slough and Mowat 1996; O'Donoghue et al. 1997). The reduction in production and survival of young is the primary cause of population declines in lynx, and reproduction "virtually ceases at the low point of the cycle" (Quinn and Parker 1987). Population dynamics of southern populations of snowshoe hare are understood poorly relative to those in northern latitudes (Hodges 2000b). There is some evidence that populations in Minnesota also undergo distinct fluctuations over a 10-15 year period (Fuller and Heisey 1986), although it is not yet clear whether snowshoe hare populations in Minnesota are able to grow at rates sufficient to support persistent lynx populations in the state.

Lynx populations are tied closely to snowshoe hare distribution and density. Snowshoe hares have evolved to survive in areas that receive deep snow (Bittner and Rongstad 1982) and prefer conifer habitats with dense shrub understories that provide food, cover to escape predators, and thermal protection during extreme weather (Wolfe et al. 1982; Pietz and Tester 1983; Fuller and Heisey 1986; Monthey 1986; Koehler and Aubrey 1994; Wirsing et al. 2002). Early successional forest stages generally have greater understory structure than do mature forests and therefore support higher hare densities (Pietz and Tester 1983; Hodges 2000a, b). Openings in mature forests with dense understory [e.g., some fens in north-central Minnesota (Pietz and Tester 1983)] also provide high-quality hare habitat (Buskirk et al. 2000).

Lynx use coarse 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). Mowat et al. (2000) summarized lynx selection of den sites in northern Canada and Alaska: "….female lynx

appear to select den sites in a number of forest types in the North. Lynx do not appear constrained to select specific stand types; rather, the feature that was consistently chosen was the structure at the site itself. Wind-felled trees were the most common form of protection selected by female lynx, although other structures such as roots and dense live vegetation were also used." In Maine, 17 den sites have been located in a variety of stand types, including 10- to 20-year-old clear-cut and adjacent residual stands (J. Organ, U.S. Fish and Wildlife Service, in litt. 1999; G. Matula, Maine Department Inland Fisheries and Wildlife in litt. 2003). Maine den sites are characterized by regenerating hardwoods and softwoods, dense understory, and abundant coarse woody debris (J. Organ, in litt. 1999, 2003). In Washington, lynx denned in lodgepole pine (*Pinus contorta*), spruce (*Picea* spp.), and subalpine fir (*Abies lasiocarpa*) forests older than 200 years with an abundance of downed woody debris (Koehler 1990). A den site in Wyoming was located in a mature subalpine fir/lodgepole pine forest with abundant downed logs and dense understory (Squires and Laurion 2000). Downed logs and overhead cover must be available throughout the home range of females with kittens to provide alternative den and nursery sites and security when lynx kittens are old enough to travel (Bailey 1974).

Lynx breed in spring, and females give birth in late May to early June to litters of up to five kittens; hare densities are correlated positively with litter size, and age at first breeding is lower when hare populations are high. During the low phase of the hare cycle, few if any kittens are born (Brand and Keith 1979; Poole 1994; Slough and Mowat 1996). Litter sizes may be smaller in the southern lynx range due to lower peak hare densities (Koehler 1990; Squires and Laurion 2000). Kittens wean at about 12 weeks after birth and stay with females during their first winter when they may hunt cooperatively (Quinn and Parker 1987); family units break up at the onset of breeding, about mid-March (Quinn and Parker 1987).

The most commonly reported causes of lynx mortality 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). Significant lynx mortality due to starvation (up to two-thirds of deaths) has been demonstrated in cyclic populations of the northern taiga during the first two years of hare scarcity (Poole 1994; Slough and Mowat 1996). Lynx also are killed by automobiles and other predators (see below), although the significance of these factors to lynx populations is unknown (Brand and Keith 1979; Carbyn and Patriquin 1983; Ward and Krebs 1985; Bailey et al. 1986).

Buskirk et al. (2000) suggested that when other hare predators, particularly coyotes (*Canis latrans*), can access lynx winter hunting areas via compacted snow they may compete for prey sufficiently to affect local lynx populations. Buskirk et al. (2000) also suggested that direct killing by coyotes, bobcats, and mountain lions (*Puma concolor*) could affect lynx numbers where these competitors' ranges overlap substantially with lynx; in addition, Quinn and Parker (1987) stated that "(G)ray wolves (*Canis lupus*) will kill lynx that they catch in the open." Bobcat home ranges often exhibit elevational or latitudinal separation from those of Canada lynx, which are better adapted to deep snow. The paws of lynx support twice as much weight on snow than bobcats (Quinn and Parker 1987). Bobcats are thought to displace Canada lynx where

both felids are locally sympatric. Canada lynx occasionally may kill bobcats (Giddings et al. 1998), although the opposite also has been reported.

Hybridization of lynx with bobcats has been confirmed in both Maine and Minnesota with DNA analysis. In Minnesota, three of 19 animals analyzed were lynx-bobcat hybrids, whereas the remaining 16 were confirmed as lynx (U.S. Fish and Wildlife Service and U.S. Forest Service, in litt. 2003). Of the three hybrids in Minnesota, biologists possessed entire carcasses of two and only a hair sample of the third. All three were from male bobcats mating with female lynx. This constituted the first confirmed evidence of hybridization between the two species. In Maine, tests of hair and tissue from 31 individual animals identified two as hybrids – one male and one female – and 29 as lynx (Maine Department of Inland Fisheries and Wildlife, in litt. 2003). The female hybrid in Maine was accompanied by kittens. In both states, the hybrid animals had external physical characteristics of both species.

In Canada and Alaska, lynx populations generally undergo marked and regular fluctuations in response to similar changes in snowshoe hare populations (Mowat et al. 2000). A lack of accurate data limits our understanding of lynx population dynamics in the contiguous United States at the southern periphery of their range and a better understanding of lynx population dynamics in the southern boreal forest "is a critical research need" (Aubry et al. 2000). Southern lynx populations may be limited naturally 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.

Status and Distribution

Canada lynx range is associated closely with the distribution of North American boreal forest inhabited by snowshoe hares (Agee 2000) and extends from Alaska, the Yukon Territories, and Northwest Territories south across the United States border in the Cascades Range and northern Rocky Mountains, through the central Canada provinces and down into the western Great Lakes region, east to New Brunswick and Nova Scotia, Canada, and south into the northeastern United States from Maine to New York (McCord and Cardoza 1982; Quinn and Parker 1987). In the western Great Lakes region, lynx range extends south from the classic boreal forest zone into the boreal/hardwood forest ecotone (Agee 2000; McKelvey et al. 2000). At the southern margins in the contiguous United States, forests with boreal features become fragmented naturally as they transition into other vegetation types, and many patches cannot support resident populations of lynx and their primary prey species.

In response to the emerging awareness of the uncertain status of Canada lynx populations and habitat in the conterminous United States and the onset of the listing process, an interagency Canada lynx coordination effort was initiated in March 1998. The Service, Forest Service, Bureau of Land Management, and National Park Service have participated in this effort. Three products important to the conservation of Canada lynx on federally managed lands have been produced: "The Scientific Basis for Lynx Conservation" (Ruggiero et al. 1999); the Lynx Conservation Assessment and Strategy (LCAS; U.S. Forest Service 1999); and Lynx

Conservation Agreements (CA) among the Service and various land management agencies. The CA promotes the conservation of Canada lynx and its habitat on federal lands and identifies actions the federal agencies agree to take to reduce or eliminate potential adverse effects or risks to Canada lynx and their habitat. The LCAS was produced in 1999 to provide a consistent and effective approach to conservation of Canada lynx on federal lands and was used as a basis for assessing the effects of the preferred alternative on Canada lynx.

Status of the Species in Minnesota

As was true historically, northeastern Minnesota supports a substantial amount of boreal forest [roughly estimated at 12,500 km^2 (4,800 mi^2)] (Great Lakes Ecological Assessment, in litt, undated). In Minnesota, the deepest snows occur in the northeast corner of the state (Minnesota Department Natural Resources, in litt. 1998). Unlike elsewhere within the Great Lakes and Northeast regions, most lynx habitat in northeastern Minnesota is on public lands, particularly the Superior National Forest. Mixed deciduous-boreal forest suitable for lynx habitat encompasses most of the Superior National Forest, which has been mapped into Lynx Analysis Units to promote lynx management under the LCAS.

Although Minnesota may support a resident population of lynx, the abundance of the species in the state appears to be highly influenced by population levels in Ontario. Minnesota has a substantial number of historic lynx reports, primarily trapping records (McKelvey et al. 2000). Harvest and bounty records for Minnesota, which are available since 1930, indicate approximate 10-year population cycles, with highs in 1940, 1952, 1962, and 1973 (Henderson 1978; McKelvey et al. 2000). Because lynx numbers did not increase in the early 1980s on the expected 10-year cycle (very few were harvested or reported observed), Minnesota closed its lynx season in 1984. During a 47-year period (1930–1976), the Minnesota lynx harvest was substantial, ranging from 0 to 400 per year (Henderson 1978), and lynx were trapped in the state through periods presumed to represent both population highs and lows. Minnesota harvest levels have been consistent with cyclical patterns in Ontario. Ontario harvests were highest in 1926-27, 1962-63, and 1972-73 (Neil Dawson, personal communication 2002) and especially low during the presumed time of the 1990s "peak" (only one-fifth the 1972-73 harvest). In the 1990s there were only four verified records of lynx in Minnesota (Minnesota Department of Natural Resources in litt. 2003).

Beginning in about 2000, Minnesota lynx numbers evidently began to rebound. Since 2000, there have been 78 verified[2] reports of lynx in Minnesota (Fig. 1), six of which included evidence

[2] Because of the possibility of misidentification (e.g., overlap in the ranges of Canada lynx and bobcat (Lynx rufus) within Minnesota), the following criteria were used to "verify" a sighting as a lynx: a photo showing distinguishing characteristics was provided; conclusive behavioral observations were provided (e.g., lynx demonstrate curiosity and little fear of humans while bobcats are very secretive & elusive); DNA analysis of a tissue sample confirmed the identification; the observer is a known expert or otherwise has considerable experience with lynx; a detailed description of physical characteristics (e.g. very big feet, long hind legs, flat face, black tip of tail, etc.) was provided.

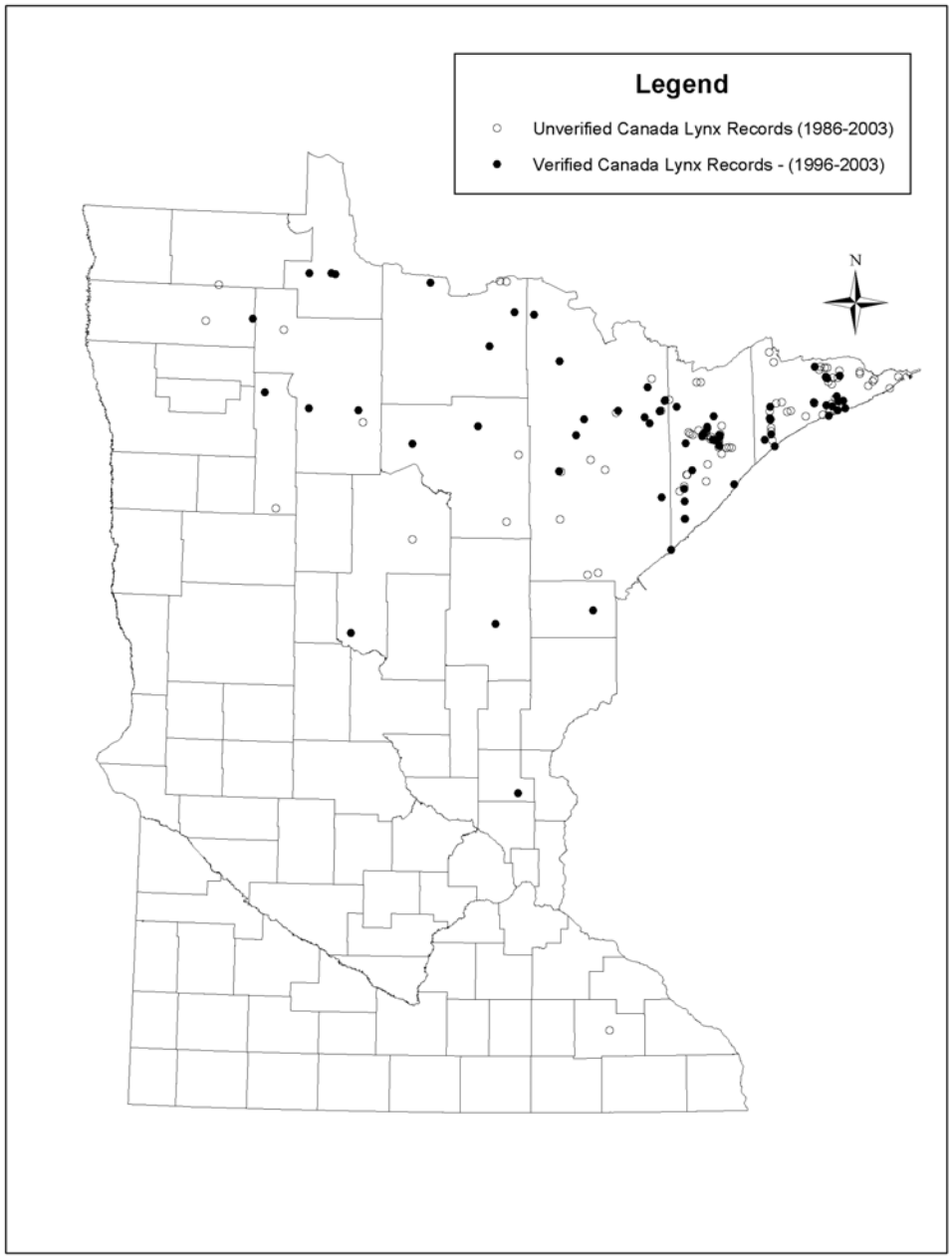

Fig. 1. Lynx records in the Minnesota Department of Natural Resources' (MNDNR) database as of August 26, 2003. MNDNR uses the following criteria to determine whether to describe a record as "verified": a photo showing distinguishing characteristics was provided; conclusive behavioral observations were provided (e.g., lynx demonstrate curiosity and little fear of humans while bobcats are very secretive & elusive); DNA analysis of a tissue sample confirmed the identification; the observer is a known expert or otherwise has considerable experience with lynx; a detailed description of physical characteristics (e.g. very big feet, long hind legs, flat face, black tip of tail, etc.) was provided.

of reproduction (kittens, Minnesota Department of Natural Resources, in litt. 2003; S. Loch, in litt. 2003). This marked increase in reports corresponds with a cyclic population high directly adjacent in Ontario (S. Loch, in litt. 2003). Research has been initiated that will help determine whether these animals are members of an established resident population in Minnesota or if these animals fail to persist when the cyclic population declines (University of Minnesota, in litt. 2002). Three radio-collared animals are being monitored currently.

Snowshoe hare harvest in Minnesota (the only available long-term index to hare abundance in the state) shows a very inconsistent pattern from 1941-2000. Hare abundance, as indicated by harvest, peaked in the early 1940s and 1950s along with lynx harvest 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 (S. Loch, in litt. 2003). Based on surveys in northern Minnesota, snowshoe hare numbers are currently high (J. Erb, Minnesota Department of Natural Resources, in litt. 2003).

ENVIRONMENTAL BASELINE

Status of the Species Within the Action Area

Unlike other Great Lakes and northeast regions of lynx range in the Unites States, most lynx habitat in northeastern Minnesota is on public lands, particularly the Superior National Forest. Mixed deciduous-boreal forest suitable for lynx habitat encompasses most of the Superior National Forest, which has been mapped into Lynx Analysis Units (LAUs) to promote lynx management under the LCAS. The proposed projects on the Kawishiwi Ranger District would occur within LAUs 507 and 508. Recent observations of lynx in the Superior National Forest on or near the Kawishiwi Ranger District indicate that lynx are likely present on these LAUs at this time.

Factors Affecting the Species Environment Within the Action Area

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. These risk factors include management of timber, wildland fire, recreation, roads and trails, grazing, and other human developments. Roads, railroads, utility corridors, land ownership patterns, and developments may affect lynx movements. Risks of direct lynx mortality may come from trapping, shooting, predator control, vehicle collisions, and competition or predation as influenced by human activities. Other large-scale risk factors are fragmentation and degradation of lynx habitat. Each of these potential risk factors may occur in the action area except livestock grazing and railroads; predator control is unlikely and restricted to depredating wolves in Zone 2 (50 CFR 17.40). Timber management, wildland fire, recreational use, roads and trails, and developments on private land inholdings are most likely to affect lynx in this area. The Superior National Forest is implementing the LCAS and Canada Lynx Conservation Agreement (CA) between the Service and the Forest Service (February 2000) during all forest activities that occur within LAUs. Thus, the aforementioned risk factors are being minimized and managed appropriately to promote the

conservation of lynx within the Superior National Forest and the proposed project sites within the Kawishiwi Ranger District.

EFFECTS OF THE ACTION

The proposed mining activities may affect lynx by temporarily disturbing any animals that are traveling near the project sites during site clearing, road construction, upgrading activities, and mineral exploration. As approximately one mile (plus 300 feet) of new roads would be constructed, and 1.75 miles of currently closed roads would be reopened, competition by bobcat and coyote could increase via increased compacted snow. However, the reopened roads would be closed effectively after work was completed; therefore, this would affect lynx only temporarily.

Indirect Effects

Indirect effects include those effects that are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. The mineral exploration activities could result in the discovery of a large mineral deposit and a request to the Forest Service for a mine, which could have numerous effects on lynx in the area. However, this activity would require separate section 7 consultation with the Service and will not receive further consideration in this document.

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 Act.

Construction and upgrading of roads and resulting activities on state land may temporarily displace lynx. Following use, the majority of the roads would be closed, so no long term effects are anticipated. Forest Service personnel will monitor to verify closure compliance and revegetation success, and a report of the effectiveness of road closure and winter trail use would be provided to the Service.

CONCLUSIONS

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 project, implemented in conjunction with LCAS, will not likely jeopardize the continued existence of the lynx. No critical habitat has been designated for this species; therefore, none will be affected.

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.

The Service does not anticipate that the proposed action will result in the incidental take of any Canada lynx. Reasonable and Prudent Measures and Terms and Conditions are not applicable because no incidental take is anticipated.

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. As we do not anticipate any adverse effects of the proposed action on Canada lynx, no conservation recommendations are necessary.

REINITIATION-CLOSING STATEMENT

This concludes consultation on the action outlined in your September 10, 2003, request for consultation for the 2003 Kawishiwi Minerals Projects. 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.

LITERATURE CITED

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, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.

Apps, C.D. 2000. Space-use, diet, demographics, and topographic associations of lynx in the southern Canadian Rocky Mountains: a study. Pages 351-372 in L.F. Ruggiero, K.B. Aubry, and S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.

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, and S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.

Bailey, T.N. 1974. Social organization in a bobcat population. Journal of Wildlife Management 38:435-456.

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.

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: biology, management, and economics. Johns Hopkins University Press, Baltimore, Maryland.

Brainerd, S.M. 1985. Reproductive ecology of bobcats and lynx in western Montana. MS. 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.

Buskirk, S.W., L.F. Ruggiero, C.J. Krebs. 2000. Habitat fragmentation and interspecific competition: implications for lynx conservation. Pages 83-100 in L.F. Ruggiero, K.B. Aubry, and 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.

Fuller, T. K., and D. M. Heisey. 1986. Density-related changes in winter distribution of snowshoe hares in northcentral Minnesota. Journal of Wildlife Management 50:261-264.

Giddings, B., W. Melquist, B. Oakleaf, and B. Bates. 1998. An assessment of lynx in the northern Rocky Mountains: a response to the U.S. Fish and Wildlife Service's request for information concerning the proposed rule to list the contiguous U.S. population of lynx as a threatened species. Montana Fish, Wildlife, and Parks, Helena.

Hatler, D.F. 1988. A lynx management strategy for British Columbia. Prep. for BC Ministry of Environment, Victoria.

Henderson, C. 1978. Minnesota Canada lynx status report, 1977. Minnesota Wildlife Research Quarterly 38:221-242.

Hodges, K.E. 2000a. The ecology of snowshoe hares in northern boreal forests. Pages 117-162 in L.F. Ruggiero, K.B. Aubry, and 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. Pages 163-206 in L.F. Ruggiero, K.B. Aubry, and S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.

Hoving, C.L. 2001. Historical occurrence and habitat ecology of Canada lynx (*Lynx canadensis*) in eastern North America. M.S. Thesis, University of Maine.

Jones, J.K., D.C. Carter, H.H. Genoways, R.S. Hoffman, D.W. Rice, and C. Jones. 1986. Revised checklist of North American mammals north of Mexico, 1986. Occas. Papers Mus. No. 107, Texas Tech University.

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 L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, L.J. Lyon, and W.J. Zielinski, editors. American martin, fisher, lynx, and wolverine in the western United States. 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.

McCord, C.M., and J.E. Cardoza. 1982. Bobcat and lynx. Pages 728-766 in J.A. Chapman and G.A. Feldhamer, editors. Wild mammals of North America: biology, management, and economics. Johns Hopkins University Press, Baltimore, Maryland.

McKelvey, K.S., K.B. Aubry, and Y.K. Ortega. 2000. History and distribution of lynx in the contiguous United States. Pages 207-264 in L.F. Ruggiero, K.B. Aubry, and S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.

Mech, L.D. 1977. Record movement of 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.

Monthey, R.W. 1986. Responses of snowshoe hares, *Lepus americanus*, to timber harvesting in northern Maine. Canadian Field Naturalist 100:568-570.

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, and S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.

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. Behavioral 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., 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.

Pietz, P.J. and J.R. Tester. 1983. Habitat selection by snowshoe hares in north central Minnesota. Journal of Wildlife Management 47:686-696.

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.

Quinn, N.W.S. and G.R. Parker. 1987. Lynx. Pages 683-694 in M. Novak, J.A. Barber, M.E. Obbard, and B. Malloch, editors. Wild furbearer management and conservation in North America. Ontario Ministry of Natural Resources, Toronto.

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.

Squires, J.R. and T. Laurion. 2000. Lynx home range and movements in Montana and Wyoming: preliminary results. Pages 337-350 in L.F. Ruggiero, K.B. Aubry, and S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.

Squires, J.R., S. Tomson, L.F. Ruggiero, and B. Oakleaf. 2001. Distribution of lynx and other forest carnivores in the Wyoming Range, southcentral Wyoming, progress report: winters 2000 and 2001. Unpubl. report, Rocky Mountain Research Station, USDA Forest Service.

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.

Tumlison, R. 1987. *Felis lynx*. Mammalian Species 269:1-8.

U.S. Fish and Wildlife Service. 1992. Recovery plan for the eastern timber wolf. Twin Cities, Minnesota.

U.S. Forest Service. 1999. Canada lynx conservation assessment and strategy. USDA Forest Service, Washington, D.C.

U.S. Forest Service and U.S. Fish and Wildlife Service. 2000. Canada lynx conservation agreement between the Fish and Wildlife Service and the Forest Service. U.S. Forest Service agreement number 00-MU-11015600-013. U.S. Fish and Wildlife Service, Denver, Colorado.

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.

Washington Department of Wildlife. 1993. Status of the North American lynx (*Lynx canadensis*) in Washington. Unpublished report. Washington Department of Wildlife, Olympia.

Ward, R. and C.J. Krebs. 1985. Behavioral responses of lynx to declining snowshoe hare abundance. Canadian Journal of Zoology 63:2817-2824.

Wilson, D.E. and D.M. Reeder. 1993. Mammal species of the world. Smithsonian Institution Press, Washington, D.C.

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.

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 49:662-670.