



United States Department of the Interior

FISH AND WILDLIFE SERVICE
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Bloomington, Minnesota 55425-1665

September 2, 2011

Ms. Tamara Cameron
Chief, Regulatory Branch
St. Paul District, Army Corps of Engineers
180 5th Street East
St. Paul, Minnesota 55101-1678

Dear Ms. Cameron:

This responds to your June 23, 2011, letter regarding consultation under section 7 of the Endangered Species Act (ESA) of 1973, as amended, for the proposed eastern progression (Public Notice 2010-04573-JCC) of the open pit iron ore mine at the Northshore Mine and for the proposed relocation of County State Aid Highway (CSAH) 70 (PN 2010-00707- JCC), in St. Louis County, Minnesota. By your letter, you have requested to enter into formal consultation with the U.S. Fish and Wildlife Service (Service), following your determination of may affect for the Canada lynx (*Lynx canadensis*), which is federally threatened and may affect for the gray wolf (*Canis lupus*), which is also federally threatened. Both the Canada lynx and the gray wolf are present in the project vicinity. You also determined that the proposed projects would have no effect on the piping plover (*Charadrius melodus*), which is federally threatened. This precludes further action as required under section 7 of the Act for the piping plover. However, if new information indicates that the piping plover may be affected, consultation with the Service must be reinitiated. Finally, you determined that the proposed projects would not adversely affect gray wolf critical habitat.

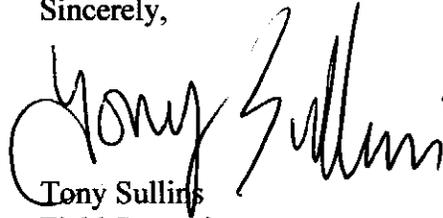
This document transmits the Service's biological opinion (enclosed) based on our review of the Northshore Mine progression project and the relocation of CSAH 70 (old St. Louis County Road 623) and their effects on lynx and gray wolf in accordance with section 7 of the Act. A complete administrative record of this consultation is on file in this office. This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 C.F.R. 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat. After reviewing the current status of the lynx and the gray wolf, 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 progression of the Northshore Mine and the proposed relocation of CSAH 70 is not likely to jeopardize the continued existence of the Canada lynx or the gray wolf. However, it is the Service's biological opinion that the proposed projects are likely to adversely affect gray wolf critical habitat, but will not result in adverse modification to gray wolf critical habitat.

The Service has determined that the proposed actions are likely to result in the incidental take of Canada lynx and gray wolf. Terms and conditions have been included that will serve to reduce

incidental take and conservation recommendations have been included to assist in the recovery of these listed species.

We appreciate the opportunity to provide this information for your planning purposes. Please contact Mr. Nick Rowse, of this office, by calling (612) 725-3548, extension 2210, if you have any questions or if we can be of further assistance.

Sincerely,



Tony Sullins
Field Supervisor

cc: Brian Bolder, Inga Foster - St. Louis County Highway Department
Scott Gischia, Dan Wolf - Northshore Mine-Cliffs Natural Resources
Kevin Molloy - Minnesota Pollution Control Agency

**BIOLOGICAL OPINION
NORTHSHORE MINE EASTERN PROGRESSION AND CSAH 70
RELOCATION
ST. LOUIS COUNTY, MINNESOTA**



**September 2, 2011
U. S. FISH AND WILDLIFE SERVICE
TWIN CITIES FIELD OFFICE
BLOOMINGTON, MINNESOTA**

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INTRODUCTION

This document transmits the United States Fish and Wildlife Service's biological opinion (BO) based on our review of two Section 404 permit applications under the Clean Water Act. The first permit application is for an expansion or eastern progression of the Northshore Mine by Cliffs Natural Resources (*see http://www.mvp.usace.army.mil/docs/regulatory/public_notice_mn/201004573PN.pdf*) and the second permit application is for a relocation of County State Aid Highway (CSAH) 70 (old County Road 623 [CR 623]) by the St. Louis County Highway Department (*see http://www.mvp.usace.army.mil/docs/regulatory/public_notice_mn/201000707PN.pdf*). Both proposed projects are located southeast of the City of Babbitt in St. Louis County, Minnesota. This biological opinion is based on information provided in the record of consultation history and the biological assessment (BA) provided by the St. Paul District, U.S. Army Corps of Engineers for these projects. The Corps determined that the proposed actions may affect lynx and gray wolf and requested that formal consultation be initiated with the Service by letter of June 23, 2011. A complete administrative record of this consultation is on file at:

U.S. Fish and Wildlife Service
Ecological Services, Twin Cities Field Office
4101 American Blvd. E.
Bloomington, MN 55425
(612) 725-3548

I. CONSULTATION HISTORY

Under section 7 of the Endangered Species Act, Federal agencies are required to consult with the Service regarding project-related impacts on listed threatened and endangered species, and their listed critical habitats. Because the progression of the Northshore Mine and relocation of CSAH 70 will require section 404 permits under the Clean Water Act regulations, the U.S. Army Corps of Engineers (Corps) is the lead Federal agency for this action.

- *February 1, 2011* – The Corps initiated section 7 consultation with the Service in Public Notice MVP-2010-00707-DWW for the applicant St. Louis County Highway Department.
- *February 16, 2011* – The Corps initiated section 7 consultation with the Service in Public Notice MVP -2010-04573-DWW for the applicant Northshore Mining Company.
- *April 15, 2011* – The Service responded to both public notices in one letter for both the progression of the Northshore Mine and the relocation of St. Louis County Road 623. The Service recommended to the Corps that they enter into formal consultation because of project impacts to both the federally threatened lynx and the federally threatened gray wolf.
- *June 6, 2011* – The Corps responded to the Service with the assessment that the proposed project actions will not affect the piping plover. However, the actions may affect, but will not likely adversely affect the gray wolf, and will likely adversely affect the lynx.
- *June 22, 2011*- The Corps, in a draft assessment, determined that the proposed actions will likely adversely affect both the lynx and that the proposed actions will not likely adversely affect the gray wolf.
- *June 23, 2011*- After discussions with the Service, the Corps restated its determination that the proposed actions will likely adversely affect both the gray wolf and the lynx.
- *June 23, 2011*- The Service responded to the Corps by letter, concurring with the determination for the gray wolf and the lynx. The Service stated that the formal consultation process was initiated by the date of the Corps' June 23, 2011 letter, and a biological opinion would be available to the Corps as soon as possible.

- *August 26, 2011* – The Service proposed to North Shore Mining that a management plan be implemented on lands under its control within the project area to benefit Canada lynx and gray wolves.
- *August 26, 2011* – Northshore Mining Company agrees to implement this management plan using Appendix E of the Forest Plan, U.S. Forest Service as guidance.

II. DESCRIPTION OF THE PROPOSED ACTIONS

Mining Progression

Northshore Mine, which is owned by Northshore Mining – Cliffs Natural Resources (NSM), is an existing large iron ore mining operation located approximately three miles south of the City of Babbitt in St. Louis County, Minnesota. The proposed CSAH 70 relocation is located at the eastern edge of the Northshore Mine and is about six miles southeast of Babbitt. The proposed projects are located in Sections 9 and 10 of T60N, R12W. The action area of the project has been defined as the footprint of the mine progression and all stockpiles, plant facilities, and hauls roads within and from the mine progression area. Also included in the action area is the CSAH 70 relocation, road resurfacing of CSAH 70, a new right-of-way and relocation of an all-terrain vehicle/snowmobile trail along the road. A 500-foot buffer around the mine progression and road relocation is also included in the action area.

NSM owns and operates the Peter Mitchell Mine at Babbitt, Minnesota; an interconnecting railroad that transports ore from the mine to the pellet production facility; and the E.W. Davis Works taconite pellet production facility at Silver Bay, Minnesota. The east pit progression project involves extending the mine further eastward using existing equipment. Plans are to mine the east end at a rate of approximately 1.85 million tons per year, which would not be more than 10 percent of the planned total annual mine production. Total mine production rates would not change as a result of the project. No physical or operating changes would occur at Silver Bay as a result of the east pit progression project.

The area of the proposed action includes land already permitted for mining by the existing Permit to Mine issued by the Minnesota Department of Natural Resources (MNDNR) and land outside the existing Permit to Mine boundary. As stated in the BA, the total area directly impacted by the east pit progression project would be 47 acres of both upland and wetland habitat. A total of 24.45 acres of wetlands would be permanently impacted from the east pit progression.

Sequencing

The proposed progression of mining activities at Babbitt is generally as follows:

- Overburden removal to onsite stockpiles
- Drilling, blasting, loading, and hauling of iron ore to an onsite crusher

- Ore crushing, storage, and conveyor loading into railcars for the 47-mile transport to Silver Bay

Taconite production activities at Silver Bay include:

- Unloading of ore from the trains
- Further ore crushing and dry cobbing (magnetic separation of ¾-inch size material with low iron content)
- Concentrating the iron by wet grinding to liberate the iron particles, magnetic separation of the magnetic iron, and froth floatation to further increase the purity of the separated iron. The remaining solids are tailings.
- Pelletizing the iron concentrate, including mixing the iron with binding agents, rolling into balls, and firing the balls in furnaces to make iron pellets.
- Iron pellets are stored onsite and loaded onto ships for transport to steel mills. The pellet storage area has a capacity of 5.4 million long tons.
- Tailings are directed to the Milepost 7 tailings basin by rail and slurry for disposal. The tailings basin also provides for storage of slurry process water, which is returned to the processing operations.

Prior to mining, diamond drills produce core samples that are used in analyzing the quality of ore and determining the future mining areas. After determining the mining areas, the surface overburden is removed using excavators and trucks. With the limited width on the mining benches and the steeply dipping footwall, each bench level needs to be mined out completely before moving down to the next bench. The overburden would be placed on rock stockpiles ready for reclamation or stockpiled in overburden stockpiles. Rotary drills would then drill 16-inch blast holes for the ore and rock, which is blasted in 45-foot lifts.

The ore and rock would then be loaded into trucks using hydraulic or electric shovels. The rock and the lean ores are stockpiled separately in the mined out portions of the pit. The trucks can haul between 200 tons and 240 tons, depending on the type of truck. The ore is hauled from the mine pit to the existing primary crusher. The primary crusher reduces the ore to 6-inch size, which is then loaded onto the conveyor belt. The ore is conveyed up an incline to the top of the existing loading bins. It is then fed by gravity into railroad cars. About 160 rail cars make up a train shipment, which is delivered to Silver Bay along the 47-mile long company owned track.

The surface overburden would be removed using excavators loading trucks. The overburden would be placed on rock stockpiles ready for reclamation or is stockpiled in overburden stockpiles. The surface overburden would then be stockpiled to the north of the eastern pit. An existing surface stockpile will be expanded eastward into the Project area and will be created following the current MNDNR Mineland Reclamation rules. It is designed to have two lifts, which will not exceed 40 feet each. The stockpile is designed to

have the upper lift at an elevation of 1690 feet above mean sea level (MSL). The rock and the lean ores would be stockpiled separately in the mined out portions of the pit within existing stockpiles located west of the proposed projects area.

The major residual product of the taconite pellet production process is tailings, which are composed of particles of non-metallic rock. NSM has an existing, permitted tailings basin that is approximately 2,300 acres in size located near the Silver Bay processing plant. While still at the NSM, coarse tailings would be separated and washed in a hydraulic sump to remove fines. The tailings are then filtered and dried to a 10-12 percent moisture range. The filtered tailings are then discharged onto the coarse tailing conveyor system for transportation to the tailing load-out bins. From there they would be loaded in rail cars and transported to the tailings basin. The coarse tailings are used to build roads and dams around the perimeter of the permitted tailings basin. Fine tailings remaining after magnetic ore separation would be pumped as a slurry via pipeline to the Milepost-7 tailings basin located in Silver Bay. The tailings basin would continue to provide storage of slurry process water which would ultimately be returned to NSM for processing operations. The rate of tailings deposition would not increase as a result of the proposed operation.

Identical to current operations at Northshore, the mine would operate 24 hours a day, 365 days a year. Mining of the progression area would take approximately five years at the planned rate. Most of the impacts to surface habitat resources would occur in the first year, when surface stripping activities are scheduled to occur. When mining activities reach the ultimate pit limit, the surface overburden portions of the pit walls would follow the standards listed in Minnesota Rules, part 6130.2900. Reclamation of the mining area for the proposed projects would be conducted in accordance with Minnesota Rules, parts 6130.1000 to 6130.4100.

The Project area drains northeasterly to the Dunka River via an unnamed stream and Langley Creek. Due to watershed alternations from past mining activities, the majority of flow in the unnamed stream is the result of mine pit dewatering. Dewatering to the unnamed creek averaged approximately 1,200 gallons per minute (gpm) from 1991 through 2007. As of fall 2010, NSM ceased discharging to the unnamed creek, thus eliminating the primary source of flow. The east pit progression would move the edge of the pit to within approximately 300 feet of the Dunka River. In closure, the future pit lake would discharge through the remaining section of the unnamed creek to the Dunka River.

Langley Creek is located south and east of the Peter Mitchell Pit and flows into the Dunka River approximately four miles upstream of the unnamed stream. The Langley Creek watershed is approximately ten square miles, including portions of the Peter Mitchell Pit that are dewatered to the creek and undisturbed areas south of the pit. The effective watershed area of the creek has been increased now that areas of the pit previously dewatered to the unnamed stream are being routed to Langley Creek. Continuous gauge data is not available for Langley Creek, but the flow based on point measurements (taken from 1974 – 1979 and 2001 – 2004) averaged 8.9 cubic feet per second (cfs) near the confluence with the Dunka River. Dewatering to Langley Creek averaged 2.8 cfs (1,250 gpm) between 1989 and 2007.

The floodplain of Langley Creek ranges from approximately 200 feet wide to 900 feet wide between the mine site and the Dunka River (as determined from aerial imagery and topographic data). Wetlands occupy much of the Langley Creek floodplain. Ultimate pit development would reduce the surface watershed area tributary to Langley Creek to approximately five square miles and would result in the elimination of dewatering discharge to the creek. The reduction of the watershed could potentially result in smaller peak flows, which would in turn affect floodplain morphology.

From the project area, the Dunka River flows generally northward into Birch Lake. The floodplain of the Dunka River ranges from approximately 400 feet wide downstream of the confluence with the unnamed creek to over 1,500 feet wide approximately one mile upstream of the Project area (based on a combination of aerial imagery and topographic data). Wetland areas occupy much of the floodplain upstream of the project area.

Pit expansion may require the creation of dikes along the pit rim nearest the Dunka River to prevent inflow during flood events. Existing elevations between the river and proposed pit expansion are approximately five feet higher than the river elevation. If pit rim dikes were constructed, it is possible the flood storage in the Dunka River floodplain would be reduced, increasing flood stages upstream of the project area. The area of potential floodplain that could be eliminated by pit rim dikes is small relative to existing wetland areas adjacent to the Dunka River, which also provide flood storage.

The BA states that approximately 53.2 acres of wetland were delineated within or adjacent to the proposed mine and stockpile progression area. All wetlands within the proposed mine and stockpile progression area would be directly impacted by filling or excavation as a result of the proposed stockpile and open pit mine progression. Within the proposed mine progression area, a total of 24.45 acres of wetlands would be permanently impacted, including: 5.06 acres of wet meadow, 7.63 acres of shrub carr/alder thicket, 11.41 acres of wooded conifer swamp, and 0.35 acres of shallow marsh. Of the permanent impacts described, 3.62 acres of wetlands were previously impacted for the expansion of the 10N stockpile, including 0.17 acres of wet meadow, 0.33 acres of shrub-carr, and 2.12 acres of hardwood swamp. Indirect impacts (e.g. dewatering) associated with the mine progression totals 1.89 acres and includes impacts to the following wetland communities - 0.14 acres of wet meadow, 1.12 acres of shrub carr/alder thicket, and 0.63 acres of wooded conifer swamp. Should indirect wetland impacts be detected, NSM would be required to provide compensatory wetland mitigation.

In 2009, a portion of a stockpile 10N was expanded and overburden fill material was placed within 3.62 acres of wetlands (0.17 acres of wet meadow, 0.33 acres of shrub-carr, and 2.12 acres of hardwood swamp). This activity was not issued a Department of the Army permit and is therefore considered an unauthorized activity. The Corps is evaluating this unauthorized activity in the current permit application as an after-the-fact impact.

NSM has proposed a management plan to be established on NSM-owned property within the project area. The purpose of this management plan is to maintain habitat connectivity

for Canada lynx and gray wolves through the project area following the eastern progression of the Northshore Mine and the relocation of CSAH 70. The management plan will be established on property owned by NSM within the action area of the proposed projects. Appendix E of the Forest Plan, U.S. Forest Service (2004) will be used for guidance in implementing this plan.

Proposed road relocation

CSAH 70 is located on the east side of Babbitt and winds through Northshore Mining Property and a privately owned parcel just south of the Dunka River. When relocated, the highway would be constructed to minimum County-State Aid Design Standards for a design speed of 50 miles per hour (mph). This would include two 12-foot lanes, a 6-foot shoulder, 4:1 inslopes, and a maximum horizontal curvature of 7 degrees. The 2011 average daily traffic (ADT) of CSAH 70 is 1400 and if the project were permitted, it is expected to increase to 1680 ADT by 2031. This is an increase of 280 vehicles per day over a 20-year period. The proposed road would have no ditches constructed through wetlands. Cross culverts would be installed to facilitate hydrology on both sides of the road where there are unavoidable crossings through wetlands. At the east junction of the proposed relocation where it rejoins the present alignment of CR 623, the remaining road to the east would be reclaimed or rehabilitated. Gravel is added to the surface and a machine reclaims or converts the bituminous surface to gravel. No wetland impacts are anticipated within the reclamation section of the project.

In order to construct the road, there would be a need to clear and grub trees and shrubs within the right of way (mechanized land clearing). This would be reduced to the minimum area needed to physically construct the road (normally about 10 feet behind the fill limits). After the vegetation has been cleared, topsoil is normally removed and temporarily stockpiled at the edge of the clearing limits to be used as a containment berm along with silt fence on the down slope perimeter. This is done as a Best Management Practice (BMP) for managing construction storm water and helps contain sediment-laden water from leaving the project and further impacting adjacent wetlands. The temporary topsoil stockpile would remain until the road has been constructed. Then the material would be spread back across the inslopes as topsoil followed by seeding to permanently stabilize the area.

The project includes one proposed crossing of an unnamed stream to the Dunka River. The present alignment of CSAH 70 crosses this stream with a 42-inch culvert. The new crossing of the stream would increase the culvert size only slightly (to 48 inches) because of some anticipated pumping by NSM. The culvert would be placed as an equalizer culvert to maintain hydrology on both sides of the road through the adjacent wetland. The installation of all culverts would include best management practices to protect water quality of the stream and the associated wetlands.

Within the road/ trail reconstruction right of way, a total of 4.81 acres of permanent wetland impacts are proposed. These permanent impacts would include: 0.09 acre of shallow marsh, 2.93 acres of shrub carr, and 1.79 acres of coniferous/hardwood swamp. In addition, there would be 0.74 acres of temporary impact due to woody vegetation clearing.

Within these areas, topsoil would be temporarily stockpiled by the contractor as a BMP during construction. Temporary impacts by wetland type would be: 0.01 acre of shallow marsh impacts, 0.48 acres of shrub-carr impacts and 0.24 acres for coniferous/hardwood swamp. No ditches would be constructed through the wetlands and cross culverts will be used to maintain hydrology on both sides of the road through wetlands. The proposed wetland impacts for the road reconstruction, including direct fill (4.81 acres) and temporary fill (0.74 acres), totals 5.55 acres. Impacts to an unnamed stream to the Dunka River would also occur. These impacts are associated with the placement of a reinforced concrete pipe culvert and reinforced concrete pipe aprons and would total 400 square feet (0.01 acres).

The applicant has proposed possible wetland reestablishment within the CSAH 70 and ATV/snowmobile trail abandonment areas. Approximately 1,350 feet of the existing entrance road to NSM would be abandoned outside of the proposed projects area. Of those 1,350 feet, approximately 600 feet abut an existing wetland on the southwest sided. The reconstructed roadway, including the reconstructed ATV/snowmobile trail will cover 15.7 acres, which includes both upland and wetland habitats. This is an increase of 6 acres of habitats from the road and trail relocation. Wetland communities also exist along approximately 700 feet of both sides of the existing ATV/snowmobile trail that follows along CSAH 70 current alignment. The applicant (NSM on behalf of St. Louis County) has proposed to restore wetland habitat within the road and trail abandonment areas by removing the existing road base and matching it to existing ground elevations. The applicant would also amend to soil to provide the appropriate medium for wetland plant and hydrology development. Those actions could potentially restore 1.93 acres of shrub-carr wetland and 1.08 acres of upland buffer.

The applicant has proposed compensatory mitigation for the remaining permanent and temporary loss of 5.51 acres of wetlands through the Road Replacement Banking Program under the Minnesota Board of Water and Soil Resources (BSWR). Currently, BWSR's mitigation bank does not have any banking credits within the project watershed. The closest banking site available for federally-approved wetland credits is located in Lake of the Woods County. (St. Louis County Highway 2011)

Beyond what has already been described above, there are no other connected actions to the proposed projects.

Canada Lynx Conservation Measures

NSM will develop a plan to maintain and/or develop Canada lynx habitat on the affected lands "for as long as Northshore controls the surface ownership of the affected 40s but will expire upon any sale or transfer of surface ownership of those 40s from Cliffs" (D. Wolf, NSM, pers. comm. 26 August 2011). The information described in Appendix E of the Superior National Forest management plan will serve as the primary guidance for developing this plan.

III. DESCRIPTION OF THE SPECIFIC AREA THAT MAY BE AFFECTED

Project Site

The project area is located near the east end of the Giants Ridge Granite Formation (Embarrass Mountains) in the eastern portion of the Mesabi Iron Range. Landforms are surficial glacial sediments deposited by the Rainy Lobe during Wisconsinian Glaciation. Topography is rolling with interspersed uplands and wetlands. Slopes within wetlands are generally flat while uplands can be much steeper (approximately 10-20 percent), although slopes are generally short and irregular. Within the project area, elevations range from approximately 1,505 MSL to 1,540 ft on upland knolls, 1,495 MSL to 1,520 MSL within wetlands, and approximately 1,495 MSL where an unnamed creek discharges into the Dunka River. (Northshore 2011)

GIS analysis using the *National Land Cover Data Set* found land cover within the action area to consist of woody wetlands, shrub/scrub wetlands, evergreen forests, mixed forests, open water (closed mine pits, the Dunka River and unnamed stream), developed land and barren land (active mine operations). (United States Geological Survey 2006) The project areas are located within the proclaimed boundary of the Superior National Forest.

Dominant wetland vegetation within the action area includes cattail, bulrush, water plantain, arrowhead, lake sedge, alder, willow, tamarack, northern white cedar, black spruce, balsam fir, balsam poplar, and black ash. In total, the two projects would permanently impact 29.26 acres of wetlands, would indirectly impact 1.89 acres of wetlands, and would temporarily impact 0.74 acres of wetlands. (Minnesota Department of Natural Resources 2011, Northshore 2011)

Near the action area, there are extensive areas of forested public land which are managed for wood products and recreation. Because of the abundance of forest resources nearby, CSAH 70 was originally built to transport timber commodities and to allow recreational travel to the Superior National Forest. CSAH 70 serves as a transportation corridor connecting State Trunk Highway 1 and the Lake Superior North Shore region to Babbitt. CSAH 70 is used daily by mine employees traveling to and from work, commercial trucking operations delivering commodities to the Iron Range, and by the general public. This level of usage makes CSAH 70 a true public road, much like main county roads in the area. 2011 average daily traffic of CSAH 70 is 1400. (St. Louis County Highway 2011)

The action area is located at the eastern most end of the Mesabi minerals formation which extends for about 100 miles through Itasca and St. Louis Counties. The action area is used by large and medium sized carnivores as a travel corridor through the Mesabi Iron Range. This statement has been collaborated by two recent studies on wildlife movement through the Mesabi Iron Range: a 2006 MNDNR study of 13 corridors and a 2009 Barr Engineering study of 18 corridors. Both of these studies identified the Northshore Mine owned corridor and noted that it was used by medium and large mammals avoiding mine features from past mining activities. These mine features include: pits, stockpiles, tailings basins and associated ancillary facilities and roads which can cause a variety of impediments to travel.

Therefore, the project area's travel corridor serves as a connection between habitats northwest and southeast of the iron formation. (Resources 2006, Engineering 2009)

The mine progression project would increase mine and stockpile footprints by a total of 47 acres. Approximately 10.9 acres of uplands and 4.78 acres of wetlands would be converted to a gravel roadway or right-of-way as a result of relocation of CSAH 70 and abutting snowmobile trail (Northshore 2011, St. Louis County Highway 2011).

Area Surrounding the Project Site

Immediately to the east of the project site is the currently operating Northshore mine and to the west is the abandoned Dunka mine. Approximately 300 feet west of the proposed CSAH alignment, the Dunka River flows north into Birch Lake. The City of Babbitt is located approximately five miles to the northeast. The Boundary Waters Canoe Area Wilderness (BWCAW) is located approximately 15 miles to the northeast and 30 miles to the northwest.

The area surrounding the action area is within the proclaimed boundary of the Superior National Forest (SNF), which is approximately 3.9 million acres in size and contains more than 2,000 lakes and 7,332 miles of streams. The project area is located within Northern Superior Uplands section of the Laurentian Mixed Forest province. The Northern Superior Uplands are comprised of fire adapted or influenced upland pine and mixed conifer hardwoods communities in the uplands, and a wide range of wetland types that include forested swamps, scrub-shrub swamps, emergent marshes, bogs, and deepwater habitats. According to the MNDNR, the main landforms of the Laurentian Uplands Subsection include till plains and outwash plains. Soils are varied and range from medium to coarse textures with brown glacial sediments forming the parent material for much of this subsection. Annual precipitation averages between 24 and 27 inches. About half of the precipitation occurs during the summer months. The growing season ranges from 106 to 121 days. There are approximately 30 lakes of at least 160 acres in size in the Northern Superior Uplands subsection. (MNDNR 2011)

Large areas of land have been subjected to decades of timber practices, which is the major land use in the region besides mineral extraction. Timber practices have influenced much of the ecological character observed presently resulting in more hardwood trees, even aged trees, patchy disturbances, clear-cuts, and species composition changes in forest canopy structure. (United States Department of Agriculture 2011, MNDNR 2011)

IV. LISTED SPECIES OR CRITICAL HABITAT THAT MAY BE AFFECTED

The proposed projects are located in St. Louis County, Minnesota, which contains two federally threatened species that occur in the action area. These are the lynx (*Lynx canadensis*) and the gray wolf (*Canis lupus*).

Environmental Baseline

Regulations implementing the Act (50 CFR §402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area which have already undergone section 7 consultations, and the impacts of state and private actions which are contemporaneous with the consultations in progress. Such actions include, but are not limited to, previous timber harvests, highway construction and other land management activities.

Canada Lynx

Canada lynx (lynx) live in the dense forests of northern Minnesota, Maine, mountains regions of the northwestern United States, and Canada. To determine local risk factors, populations and habitat, the Service has divided their range into five geographic areas: Cascade Mountains, Northern Rocky Mountains, Southern Rocky Mountains, Great Lakes, and Northeast. The Great Lakes geographic group of lynx is discussed in this document. Boreal forests are prevalent across most of Canada but extend south into the northern portions of the United States. Northern Minnesota, Wisconsin, and Michigan represent the southern extent of the range for the lynx in the Midwest. Lynx are specialized predators that have adapted to hunting in deep snow conditions of the boreal forests which support the primary prey, snowshoe hare (*Lepus americanus*). (Corps of Engineers 2010, Resources 2011a)

The snowshoe hare has a roughly 10-year population cycle. Lynx also demonstrate a 10-year population cycle that mirrors the snowshoe hare's cycle with a slight lag. It is during the time immediately following a decline in snowshoe hare numbers that lynx are most likely to be found in Minnesota. Snowshoe hares seem to prefer habitats consisting of regenerating forest (after tree harvesting or fire disturbance), shrubby grassland, upland conifer, and lowland conifer habitats, respectively (Moen 2008). Lynx will also prey on red squirrels when snowshoe hare populations are low. According to the Service's 2000 *Canada Lynx Conservation Assessment and Strategy*, "the ranges of snowshoe hare and lynx are nearly coincident across North America" and that "recommendations for conservation and management of snowshoe hare and their habitats are a critical component of the lynx conservation strategy." (Ruediger 2000)

Lynx prey primarily on snowshoe hares, especially in the winter when they comprise 35-97 percent of the diet. (Koehler and Aubry 1994) Lynx may modify hunting behavior and switch to alternate prey when hare densities are low. (O'Donoghue et al. 1998a, O'Donoghue et al. 1998b) Other prey species include red squirrel (*Tamiasciurus hudsonicus*), other small rodents, small carnivores, and birds, including ruffed grouse. (Moen et al. 2004) Recent research indicates that the red squirrel is not an important prey species for lynx in northeastern Minnesota (Burdett 2007, Moen 2008), However, similar to lynx in Montana, Squires and Ruggiero (2000) found that red squirrels comprised only

two percent of the winter diet of lynx in Montana. In Minnesota, Moen (2008) found that snowshoe hare remains were found in 76 percent of the lynx scat in their study, while no evidence of red squirrels remains were detected.

Lynx use coarse woody debris, such as downed logs, root wads, and windfalls, to provide denning sites with security and thermal cover for kittens. (Koehler 1990, Koehler and Brittell 1990, Moen et al. 2008, Squires et al. 2001) The integral component for all lynx den sites appears to be the amount of downed, woody debris present rather than the age of the forest stand. (Moen et al. 2008) A 2008 Natural Resources Research Institute (NRRRI) of the University of Minnesota-Duluth study found that among the radio collared lynx followed, den sites consistently had lower stem density (*i.e.*, regenerating forests) than the surrounding area, with over 80 percent of tree stems being coniferous species. Black spruce, balsam fir, white spruce, and northern white cedar were present but species composition varied among den sites.

Mating occurs in late winter, and from one to five kittens is born 65 days later. In years of low or average snowshoe numbers, few or no kittens survive, but when hares are abundant, kitten survival is very high. Kittens stay with their mother for one year before dispersing to their own home range. (Resources 2011a) While it has been assumed lynx would prefer to travel where there is forested cover, the literature contains many examples of lynx crossing large, unforested openings. The ability of both male and female lynx to disperse long distances, crossing unsuitable habitats, indicates they are capable of colonizing suitable habitats and finding potential mates in areas that are isolated from source lynx populations.

Recent studies of Minnesota lynx show that male home ranges varied between 11 and 201 mi², and female home ranges varied between 2 and 37 mi². (Burdett 2007) Home ranges varied during the breeding season; males tended to expand the size of their home ranges, presumably to search for females; females tended to contract their home ranges as the birthing period approached. (Burdett 2007) A study of radio-collared lynx in Minnesota documented approximately 40 percent of male and female lynx making long distance movements outside of their home range between Ontario, Canada and Minnesota. (Moen 2010) Of those lynx that made long-distance movements, females tended to move 62-124 miles (100-200 km) and did not return to their original home range, while males moved 31-49 miles (50-80 km) back and forth between Ontario and Minnesota. (Moen 2010) While topographic features may influence in mountainous western states, lynx in Minnesota tended to move nearly straight paths. (Moen 2010)

Known causes of mortality for lynx include starvation of kittens, trapping (both accidental and deliberate -- lynx can be legally hunted in Canada), and vehicular collisions. During periods of low snowshoe hare numbers, starvation can account for up to two-thirds of all natural lynx deaths. Hunger-related stress may increase dispersal, which in turn could increase exposure of lynx to other forms of mortality such as trapping and vehicle collisions. Linear features such as roads may benefit lynx from an energetic perspective, but may also have negative effects if they increase human exposure and the chance of incidental mortality. (Moen 2010) Of the 39 lynx mortalities recorded in Minnesota since

2000, ten died after being trapped, seven died as a result of collisions with cars, twelve died of unknown causes, seven were shot, two died after collisions with trains, and one was likely predated. (U.S. Fish and Wildlife Service unpubl. data) Although there is no longer legal harvest in Minnesota, lynx that travel long-distances into Canada are susceptible to legal harvest there. (Moen 2010) Four of the ten trapped Minnesota lynx were taken as legal harvest in Canada. (U. S. Fish and Wildlife Service unpubl. data)

According to data received in the completion of NSM's mine progression environmental assessment, several sightings of the lynx have been reported on or near the action area since 2000. Once each within the past two years, a Northshore mine employee has recorded the appearance of a lynx within the action area. Moreover, several extensive surveys for lynx have been conducted in association with other mining projects in the area, dating back to 2005. As part of a lynx survey conducted for the Birch Lake Project and Maturi Project for Franconia Minerals Corporation, a lynx was snow-tracked in Townships 60 and 61 North, Range 12 West, including along survey routes immediately adjacent to the south side of NSM's East Pit Progression Project. Tracking occurred on approximately 11 miles of lynx trail over a 10-day period. The wildlife biologist conducting the survey determined that all trail segments tracked in these two townships were made by one lynx. Scat collections from lynx have also been made in the north and south of the Project area. Snowshoe hare and red squirrel, both prey species of lynx, have been observed during spring wildlife surveys in the area. Because the home range of the lynx is generally about 40 square miles, it is possible that one or more lynx could use habitat associated with the action area. Lynx trail intercepts and scat collections occur in the immediate vicinity of the action area. (PolyMet Mining Company 2006, Northshore 2011)

The actual population of lynx in Minnesota is somewhat unknown due to their low density. Approximately 200 lynx have been reported in St. Louis County since 2000 (MNDNR 2006), including verified, probable, and unverified sightings. According to NRRI's *Canada Lynx in the Great Lakes Region 2009 Annual Report*, "it is unlikely that there are more than 200 lynx in Minnesota." However, it is not clear if the population in Minnesota represents a resident, transient, or a dispersing population. From the 2006 PolyMet Canada Lynx Assessment, the term "resident population" refers to a group of lynx that has exhibited long-term persistence in an area based on a variety of factors, such as evidence of reproduction, successful recruitment into the breeding cohort, and maintenance of home ranges. The word "transient" refers to a lynx moving from one place to another within suitable habitat. The word "dispersing" refers to lynx that have left suitable habitat for various reasons, such as competition or lack of food. When dispersing lynx leave suitable habitat and enter habitats that are unlikely to sustain them, these individuals are considered lost from the metapopulations unless they return to boreal forest.

The ability of Minnesota to support a resident population of lynx rests upon the availability of boreal forest habitat patches which can support lynx and snowshoe hares (e.g. lynx block habitat southeast of the project area and refugia northeast of the project area). In spite of the limited studies of lynx resident population, 2003-2009 data from NRRI's radio tracking

of lynx supports the theory that a small, low density population of lynx persist in Minnesota (Moen 2009).

The lynx was once hunted and trapped in Minnesota, but due to declining numbers in Canada, the lynx has been a state-protected species since 1984. The lynx was federally-listed as a threatened species in 2000. Critical habitat, as defined by the ESA, is a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. In 2009, critical habitat was designated for Canada lynx and is located one mile south and one mile north of the proposed project area. Only three miles separate the two designated critical habitat areas for lynx through the proposed project site. Lynx populations are not in jeopardy in Canada and are afforded no special status there. (Corps of Engineers 2010)

Status for listing

Reason for Listing

The Western Great Lakes Distinct Population Segment of the Canada lynx is threatened by the inadequacy of the existing regulatory mechanisms. Current U.S. Forest Land and Resource Management Plans include programs, practices, and activities within the authority and jurisdiction of Federal land management agencies that may threaten lynx or lynx habitat. The lack of protection for lynx in these plans render them inadequate to protect the species. (65 FR 16052, March 24, 2000)

Status and Distribution

Lynx range is associated closely with the distribution of North American boreal forest inhabited by snowshoe hares. (Agee 2000) It 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, and east to New Brunswick and Nova Scotia, Canada, and south into the northeastern United States from Maine to New York. (McCord and Cardoza 1982)

Within the transitional boreal forest within the contiguous United States there are core areas for lynx in Maine, Minnesota, Montana, Washington and likely Idaho. (68 Federal Register 40076-40101, July 3, 2003) More generally, these core areas are contained within the Northeast, Great Lakes, Southern Rocky Mountains, and Northern Rocky Mountains/Cascades regions. The status of lynx in the Minnesota/Great Lakes region is summarized below. Outside of Minnesota in the Great Lakes region, lynx may also occur in Wisconsin and Michigan, but there is no current evidence of reproduction there and suitable habitat is limited and disjunct from occupied habitat in Minnesota and Canada. (68 Federal Register 40076-40101, July 3, 2003)

In Minnesota, recent and historical lynx records are primarily in the northeastern part of the state, especially in the Northern Superior Uplands Ecological Section. Historically, this

area was dominated by red pine (*Pinus resinosa*) and white pine (*P. strobus*) mixed with aspen (*Populus spp.*), paper birch (*Betula papyrifera*), spruce, balsam fir (*A. balsamifera*) and jack pine (*P. banksiana*) (MNDNR 2003). 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 SNF Land and Resource Management Plan (USDA Forest Service 2004).

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, McKevley et al. in Ruggiero et al. 2000) Lynx abundance in Minnesota appears to be directly related to population levels in nearby Canada (Mech 1980) – based on trapping records, lynx abundance in Minnesota appears to lag fluctuations in Manitoba, Ontario, and Saskatchewan by about three years. (McKelvey et al. 2000) During a 47-year period (1930–1976) before cessation of legal harvest, the Minnesota lynx harvest ranged from 0 to 400 per year (Henderson 1978) and lynx were captured in the state through periods presumed to represent both population highs and lows.

In the 1990s there were only five verified records of lynx in Minnesota (S. Loch, pers. comm. 2006). Beginning in about 2000, Minnesota lynx numbers evidently began to rebound. Genetic analyses of scat and hair samples collected primarily along lynx snow trails and tissue samples from dead specimens and live captured lynx have confirmed presence of the 104 unique lynx genotypes (46 males, 57 females, and one undetermined) and eight individual lynx-bobcat hybrids (3 females and 5 males) in Minnesota since 2000. (Catton & Loch 2010) Lynx were detected in more than 10 counties. However, the majority of the lynx were detected in St. Louis, Lake and Cook Counties, where most of the data collection has been focused. (Catton and Loch 2010) This number represents only a subset of the actual number of lynx that have been present in the state since 2000.

Lynx researchers have confirmed at least nine lynx dens in Minnesota by following the activities of radio-collared females in the years 2004-2006. (R. Moen, Natural Resources Research Institute, Duluth, MN, pers. comm. 2006) Moen et al. (2008) located kittens every year in which females were radio-collared, totaling 33 kittens from 10 litters from 2004 through 2007.

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. Based on counts of hares made during spring grouse drumming surveys and mid-winter furbearer track surveys, snowshoe hare numbers are currently “near a peak,” but remain far below the numbers observed in the late 1970’s. (J. Erb, MNDNR, *in lit.* 2004)

Lynx may not be legally trapped in Minnesota, where they are a protected species, but at least seventeen lynx have been captured incidentally in recent years by trappers in pursuit of other species – seven of these lynx died as a result. (U. S. Fish and Wildlife Service, Bloomington, Minnesota, unpubl. data)

In previous biological opinions for federal actions that are ongoing in Minnesota, the Service anticipated various levels of take. These anticipated levels of take are described below, along with the actual recorded take that may be ascribed to each action. The Service monitors all known take and mortality of lynx in Minnesota in cooperation with the Forest Service.

- 2004 - Up to two lynx per year, but no more than 20 in total, over the 15 years after the approval of the Revised Land and Resource Management Plans, Chippewa and Superior National Forests. These plans were approved in July 2004. Thus, the Service has anticipated that this take would occur between July 2004 and July 2019. Thus far, only one incidental take may be ascribed to the Forest Service's implementations of these plans – a lynx was killed by an automobile in April 2005 on the Superior National Forest.
- 2005 - Trunk Highway 371 North, Federal Highway Administration – One over a 30 year period (2005-2035). Thus far, no take may be ascribed to this action. 2005 - Trunk Highway 1, Federal Highway Administration – Up to three lynx, over a 30 year period (2005-2035). Thus far, no take may be ascribed to this action.
- 2005 - Trunk Highway 53, Federal Highway Administration - Three lynx over the life of the project, a period of approximately 30 years from the start of project construction. Thus far, no take may be ascribed to this action.
- 2006 - Clean Water Act permit for the discharge of dredged or fill material into navigable waters by Northshore Mine, U.S. Army Corps of Engineers – One lynx during the ten year project period (2006-2015). Thus far, no take may be ascribed to this action.
- 2007 – Paving of Forest Road (Denley Road), in St. Louis and Lake Counties, Minnesota, Superior National Forest - One lynx killed by a vehicle as frequently as once every 10 years, on the 10.4 miles of FR 424 to be reconstructed. Thus far, no take may be ascribed to this action.
- 2007 - Mittal Steel, Minorca Mine Inc. East Reserve Project, U.S. Army Corps of Engineers - One lynx killed by a vehicle once every 16 years in the action area. Thus far, no take may be ascribed to this action.
- 2009 – Mesabi Nugget, U.S. Environmental Protection Agency – One lynx killed by a vehicle during the 30 year project period. Thus far, no take may be ascribed to this action.

Collectively, we anticipate that these actions would result in the take of approximately three lynx per year within their combined actions areas. In addition, during the approximately seven years during which the Service has collected lynx mortality data in

Minnesota it has recorded the deaths of twenty-four lynx due to human causes (one of these was anticipated by a biological opinion).

As it did historically, the boreal forest of the Northeast currently exists primarily in Maine where habitat is currently optimal and a resident, breeding population of lynx occurs. Maine's lynx population is directly connected to substantive lynx populations and habitat in southeastern Quebec and New Brunswick. Lynx numbers in Maine apparently increased between 1999 and 2003, coinciding with regeneration of forest clearcut in the 1970's and 1980's and high numbers of lynx in nearby Quebec. (Hoving et al. 2004) The potential exists for lynx to occur in New Hampshire because of its direct connectivity with Maine, and we presume they currently occur there. Lynx in Vermont have always existed solely as dispersers. Lynx occurring in New York since 1900 have been dispersers.

In Northern Rocky Mountains/Cascades Region, the majority of lynx occurrences are associated at a broad scale with the "Rocky Mountain Conifer Forest;" within this type, most of the occurrences are in moist Douglas fir (*Pseudotsuga menziesii*) and western spruce/fir forests. (McKelvey et al. 2000) Most of the lynx occurrences are in the 1,500-2,000 meters (4,920-6,560 feet) elevation class. (McKelvey et al. 2000) These habitats are found in the Rocky Mountains of Montana, Idaho, eastern Washington, and Utah, the Wallowa Mountains and Blue Mountains of southeast Washington and northeastern Oregon, and the Cascade Mountains in Washington and Oregon. A substantial proportion of the verified lynx occurrences in the United States and confirmed breeding are from this region. The boreal forest of Washington, Montana, and Idaho is contiguous with that in adjacent British Columbia and Alberta, Canada.

The Northern Rocky Mountains/Cascades Region supports the most viable resident lynx populations in the contiguous United States, while recognizing that, at best, lynx in the contiguous United States are naturally rare. Strong evidence exists to support the presence of resident lynx populations distributed throughout much of the forest types considered lynx habitat in Montana and Washington. Resident lynx populations probably exist in contiguous habitats in Idaho and northwestern Wyoming. Lynx have probably always occurred intermittently in Oregon and Utah, although the historical or current presence of resident populations in either of these States has not been confirmed.

It is unclear whether lynx in Southern Rocky Mountains historically occurred as a resident population or if historic records were of periodic dispersers. If a resident lynx population occurred historically in the Southern Rocky Mountains, then this native population has been lost. Isolation from potential source populations may have led to the extirpation of lynx in this region. Although habitats in the Southern Rockies are far from source populations and more isolated, it is still possible that dispersers could arrive in the Southern Rocky Mountains during highs in the population cycle.

From 1999 through 2006, the Colorado Division of Wildlife (CDOW) reintroduced 218 lynx from Canada and Alaska into southwestern Colorado. (Shenk 2009) No lynx were released in 2007, 2008 or 2009. As of August 2009, CDOW was tracking 37 of the released animals and had confirmed 118 mortalities. (Shenk 2009) Reproduction was first

documented in 2003 when 6 dens and a total of 16 kittens were found in southwestern Colorado. A total of 42 dens were found during 2003-2009 surveys. No dens were found in 2007 or 2008. All of the dens have been scattered throughout the high elevation areas of Colorado, except one den was found in southeastern Wyoming in 2004. (Shenk 2006, 2009)

Interagency Coordination

In response to the emerging awareness of the uncertain status of lynx populations and habitat in the conterminous United States and the onset of the listing process, an interagency lynx coordination effort was initiated in March 1998. The Service, the U.S. Forest Service, the Bureau of Land Management, and the National Park Service have participated in this effort. Three products important to the conservation of lynx on federally managed lands have been produced: "The Scientific Basis for Lynx Conservation" (Ruggiero et al. 2000); 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 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 lynx and their habitat. The LCAS was produced in 1999 to provide a consistent and effective approach to conservation of lynx on Federal lands.

Gray Wolf

Gray wolves are known to be habitat generalists often utilizing a wide variety of habitats across North America, including forested areas of northern Minnesota. Wolves are social animals that live in packs of two to twelve. Packs are primarily family groups consisting of a breeding pair, their pups from the current year, offspring from one or two previous years, and occasionally an unrelated wolf. Generally, gray wolves breed around two or three years of age. Mating occurs in January and February with pups born in late April or early May. Litters commonly include four to six pups but could range from one to eleven pups. The majority of wolf packs have one litter a year. Gray wolf dens are often located in rock crevices or are dug out from root wads. Wolves primarily are predators of medium and large mammals. Wild prey species in Minnesota include white-tailed deer, moose, beaver, snowshoe hare, and muskrat. (Corps of Engineers 2010, Resources 2011b)

Gray wolf populations fluctuate with food availability, strife within packs, disease, and accidental or intentional killing by people. Gray wolves in Minnesota are part of the distinct population segment identified by the Service as the Western Great Lakes Population of gray wolves, which includes all of Minnesota, Wisconsin and Michigan and portions of Iowa, North Dakota, South Dakota, Illinois, and Ohio. This population of gray wolves has responded to management and protection efforts, has exceeded recovery goals, and continues to thrive. Within Minnesota, the MNDNR estimated that the population of gray wolves was 2,921 animals as of the 2007/2008 survey. This is above the management plan goal of a population of at least 1,600 wolves to ensure long term survival. There have been no significant changes or fluctuation in the population of the gray wolf in Minnesota over

the last ten years. Based on this information, it appears that the gray wolf has made a full recovery in Minnesota. (Corps of Engineers 2010, U. S. Fish and Wildlife Service 2011)

Status for listing

Reason for Listing

Gray wolves are known to occur within the action area and have been observed there many times in the past ten years. The action area is located within gray wolf critical habitat. Wolves have also been observed at other mine sites on the Iron Range. Based on this information, gray wolves near the action area and along the Iron Range are tolerating a certain amount of human disturbance and mining activity within their established territories. (Resources, Gray Wolf/Timber Wolf, *Canis lupus*, 2011)

The gray wolf was listed as an endangered species in 1967. However, the status of the gray wolf has changed multiple times over the last four years based on the identification of distinct populations in different regions of the United States; the health of those populations; and a lawsuit filed against the Service for removal of identified populations of the gray wolf from the federal endangered species list. On March 27, 2006, the Service published a proposed rule to establish the Western Great Lakes Distinct Population Segment (DPS) of the gray wolf. This Western Great Lakes DPS includes all of Minnesota, Wisconsin, and Michigan; the eastern half of North Dakota and South Dakota; the northern half of Iowa; the northern portions of Illinois and Iowa; and the northwestern portion of Ohio. At that time the Service further proposed to remove the Western Great Lakes DPS from the List of Endangered and Threatened Wildlife. The Western Great Lakes DPS of gray wolves was removed from the federal endangered species list in February 2007 and then added back to the list in September 2008 based on a U.S. District Court ruling. In April 2009, the Western Great Lakes DPS of gray wolves was again removed from the federal list but a ruling on July 1, 2009, withdrew the delisting to allow for adequate public comment on the Service plan to delist the gray wolf. (U. S. Fish and Wildlife Proposal to Remove ESA Protection for Gray Wolves in Western Great Lakes DPS and the National Wolf Strategy, 2011)

On May 5, 2011, the Service published a proposed rule to reevaluate the listing of the Minnesota population of gray wolves and revise the listing to conform to current statutory and policy requirements (76 FR 26086). In that proposed rule, the Service recognized recent taxonomic information indicating that the gray wolf subspecies *Canis lupus lycaon* should be elevated to the full species *C. lycaon*. The Service proposed to identify the Minnesota population as a Western Great Lakes DPS of the gray wolf and to remove this DPS from the List of Endangered and Threatened Wildlife. The Service also proposed to revise the range of the gray wolf (the species *C. lupus*) by removing all or parts of 29 eastern States, which, based in part on recognition of *C. lycaon*, were not part of the historical range of the gray wolf. The Service also announced the reopening of the comment period for our May 5, 2011, proposed rule to provide for public review and comment of additional information regarding our recognition of *C. lycaon* as a separate species. The Service is seeking information, data, and comments from the public with

respect to new information relevant to the taxonomy of wolves in North America. In addition, the Service made a correction to their May 5, 2011, proposed rule and notified the public that it is considering concluding that proposed rule with two or more final rules. At the time of the writing of this BO, the gray wolf in Minnesota is currently listed as a threatened species. (Service, Endangered Species in Minnesota County Distribution of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species, 2011)

V. EFFECTS ANALYSIS

Effects to the wildlife corridor used by both the lynx and gray wolf

Connected forested habitats allow large and medium size carnivores, including lynx and wolves, to easily move long distances in search of food, cover, and mates. Highways and private lands can interrupt existing habitat connectivity and further fragment habitat, reducing the potential for population interchange. The portion of the action area that is utilized as a corridor is located northeast of the existing NSM facility and southwest of the Dunka Pit and is approximately 1200 feet wide.

Corridors not only provide connectivity to habitat blocks, they help ensure that genetic interchange within and between geographic areas occurs in northern Minnesota. Based on survey information, sighting reports, and radio-collar tracking studies, it is likely that the project area is used on a routine basis by lynx and wolves traveling northeast towards the BWCAW and Canada in search of snowshoe hares.

Use of the action area corridor by wildlife is supported by the results of the Barr Engineering study *Cumulative Effects Analysis of Wildlife Habitat and Threatened and Endangered Wildlife Species* prepared in 2009 for U.S. Steel as part of the Keetac Expansion Project. This report evaluated opportunities for wildlife movement back and forth across the Iron Range from near Grand Rapids to Babbitt. Much of that roughly linear corridor contains significant barriers to wildlife movement, especially for larger species like wolves, lynx, bear and moose, which all have large home ranges. The Barr study identified 13 wildlife corridors that provide opportunities for long-distance wildlife movement. The study further found that four of these corridors would become impassable within the next 30 years as a result of future mining and other development. The Project area lies within one of the 13 wildlife corridors identified along the Iron Range. Note that in the six-mile radius of lynx surveys near the action area, a measurable amount of the observed evidence of lynx activity occurs along the wildlife corridor that passes through the action area. (Engineering 2009)

A 2010 study completed by the NRRI found that the radio collared lynx seemed to prefer right of ways along roadways rather than heavily forested areas. The long-distance movements of the twelve study lynx were often within 200 meters (656 feet) of a road, trail, or other linear feature when outside of the BWCAW, which is largely roadless. The study went on to say that linear features such as roads benefit lynx from an energetic perspective, but may also be negative if they increase the chance of incidental mortality because of exposure to humans. (Moen 2010)

If the mine progression and relocation of CSAH 70 were permitted, the wildlife corridor width would decrease to approximately 600 feet. In addition, part of the remaining wildlife corridor would be taken up by the Dunka River. Because the relocated road would pass within 30 feet of the Dunka River on the south side, it is assumed that wildlife would primarily use the north side of the river. The functional width of the wildlife corridor would then be approximately 550 feet. This number could be smaller as a result of noise aversion and snow compaction caused by recreational snowmobiling that would occur immediately adjacent to the CSAH 70 roadway or as a result of seasonal flooding of the Dunka River. (Northshore 2011, St. Louis County Highway 2011)

A second wildlife corridor lies approximately 8.5 miles southwest of the project area, and the northeastern extent of the Iron Range is approximately three miles northeast of the affected wildlife corridor. Although it is likely that lynx and wolves would continue to utilize the smaller corridor in some fashion, its reduction by 50 percent is a significant effect to the mobility of the species within the immediate area. NSM has agreed to establish a management plan until such time as the property is no longer under control by NSM. The benefits of this management plan will be to maintain a wildlife corridor between the Northshore mine and the Dunka pit; thus allowing the continuation of travel by wolves and lynx between relatively undisturbed lynx and wolf habitat to the northwest with the same habitat to the southeast of Northshore Mine.

Effects to Canada lynx

There will be a direct loss of approximately 57.7 acres of habitat in the area of the road relocation, mine, and stockpile expansions. Due to ongoing mining operations, it is unlikely that lynx routinely use the action area for shelter, dens, or hunting. It is more likely that the action area is utilized as travel corridor for lynx moving between higher quality privately and publically owned forest lands to the north and south. Maintenance of the connectivity of the corridor is important because of the fragmented and noncontiguous nature of state and federal public lands. Both the reduction in size and the reduced functionality of the remaining corridor may risk adversely affecting the lynx in this area. More discussion of the action area, its use as a wildlife corridor and potential effects was previously discussed in section 5.1. Critical habitat for the lynx was designated in 2009 and is about one mile north and south of the action area. When designated, the critical habitat boundary excluded large areas of the Iron Range, including the project area. (Northshore 2011, St. Louis County Highway 2011, Ruediger 2000) Specific sections of land encompassing the Iron Range were not included because they did not contain the physical and biological features essential to the conservation of Canada lynx. (U.S. Fish and Wildlife Service 2009a)

Light and glare, roads, and noise associated with the projects could negatively impact lynx. The mine progression would operate 24 hours a day, 365 days per year, for approximately five years. Light and glare would primarily be associated with plant buildings and structures, active stockpiles, and mine pits. Light and glare can affect the predation behaviors of lynx, which usually hunt at night. Lynx traveling through the

action area would likely avoid areas of the mine site that are active and well lit. The area exposed to light and glare would expand as a result of this project; however, the light impacts from the mine site would be expected to be similar to impacts experienced from the current operation of NSM.

Mining and processing are a source of various levels of noise, vibrations, and other disturbances. These activities have been a part of the Iron Range for decades and to a certain degree, local wildlife are likely to be accustomed to the sound from normal mine activities in the area. Noise impacts from the mine site and roadway traffic would be expected to be similar to impacts experienced from the current operation of NSM and CSAH 70. Sources of noise from the project sites would include: chain saws and skidders used in clearing the project site, blasting, excavators and drills, large trucks hauling and dumping rock, alarms and warning sirens, and trains. It is likely that lynx would avoid the action area when high decibel activities and strong vibrations are present.

All forested areas within the direct footprint of the proposed projects would be removed. Forest management practices such as thinning, commercial harvest, and post-harvest treatments would continue to occur at irregular intervals on non-project lands within the action area and would influence habitats for lynx and its prey. As described previously, snowshoe hares may reach highest densities in regenerating conifer forests (similar to portions of the project area). Loss of forestlands and associated overstory and understory vegetation from mine and roadway construction and development would likely make these areas unsuitable for snowshoe hare habitat, and in turn, use by lynx.

Rail traffic is not expected to increase due to increased production under the proposed projects; only the length of individual trains may change. Therefore, there is no increased probability for lynx fatalities from train traffic as a result of the proposed projects.

There is also a potential increased risk of lynx fatalities through vehicle collisions as a result of increased traffic as a result of the mining progression and upgraded roadway. Within what would be the remaining corridor, the lynx could either travel within the 550 foot forested area or along the CSAH 70 roadway, right of way, or snowmobile trail. As described previously, lynx have been known to travel along roadways and right of ways for convenience. This increases the likelihood that a vehicle traveling at 50 mph along CSAH 70 could hit and kill a lynx. The probability of a collision with a mining truck is lower as a lynx would likely have the ability to avoid a collision with a relatively slow-moving mining truck (maximum average speed is about 30 mph). The improvement of the existing haul roads and relocation of CSAH 70 would not lead to an increase in road density in the action area. All roads on the mine site are closed to public access and any improvements to these roads would not lead to increased public access or intentional or accidental lynx kills by the public. (Northshore 2011, St. Louis County Highway 2011, PolyMet Mining Company 2006)

Based on the assessment that the projects would have significant effects to lynx habitat connectivity, that the potential for a lynx fatality under the projects is likely, and that the

low resident lynx population would be negatively affected by potential increased fatality, we agree with the Corps that the proposed projects may adversely affect the lynx.

Effects to gray wolf and its Critical Habitat

The action area is within designated critical habitat for the gray wolf in Minnesota. There will be a direct loss of approximately 57.7 acres of gray wolf critical habitat in the area of the road relocation, mine, and stockpile expansions. It is likely that wolves routinely use the action area as a travel corridor between two higher quality forested areas located to the north and south. Further discussion of the action area and its use as a wildlife corridor was previously presented in section 5.1. (Engineering 2009) Five main factors are critical to the long-term survival of the gray wolf: (1) large tracts of wild land with low human densities and minimal accessibility by humans, (2) ecologically sound management, (3) availability of adequate wild prey, (4) adequate understanding of wolf ecology and management, and (5) maintenance of populations that are either free of, or resistant to, parasites and diseases new to wolves or are large enough to successfully contend with their adverse effects. (U.S. Fish and Wildlife Service 1992) Gray wolf prey density is not expected to decrease under these projects, nor will the projects increase permanent human population densities or road densities; both of which are important constituent elements of gray wolf critical habitat. However, there will likely be increased mortality of gray wolves crossing the upgraded CSAH 70 or from gray wolves using CSAH 70 as a travel corridor. This increased mortality will be due to collisions with vehicles using the realigned CSAH 70.

Light and glare, roads, and noise associated with the project could also impact wolves. The mine progression would operate 24 hours a day, 365 days per year, for approximately five years. Light and glare would primarily be associated with plant buildings and structures, active stockpiles, and mine pits. Wolves traveling through the action area would likely avoid areas of the mine site that are active and well lit. Light and glare can affect the behaviors of wolves and make some more susceptible to hunting at night. This change in predation (wolves normally hunt early to late morning) could increase the chance of a roadway kill due to low visibility. The area exposed to light and glare would expand as a result of this project; however, the light impacts from the mine site would be expected to be similar to impacts experienced from the current operation of NSM.

Mining and processing are a source of various levels of noise, vibrations, and other disturbances. These activities have been a part of the Iron Range for decades and to a certain level, local wolves are likely to be accustomed to the sound from normal mine activities in the area. Noise impacts from the mine site and roadway traffic would be expected to be similar to impacts experienced from the current operation of NSM and CSAH 70. Sources of noise from the project site would include: chain saws and skidders used in clearing the project site, blasting, excavators and drills, large trucks hauling and dumping rock, alarms and warning sirens, and trains. It is likely that wolves would avoid the action area when high decibel activities and strong vibrations are present.

All forested areas within the direct footprint of the mine expansion and roadway alignment would be removed. Forest management practices such as thinning, commercial harvest, and post-harvest treatments would continue to occur at irregular intervals on non-project lands within the action area and would influence habitats for wolf and prey. Loss of forestlands and associated overstory and understory vegetation as a result of the proposed projects may reduce the populations of wolf prey in the immediate area.

Rail traffic is not expected to increase due to increased production under the proposed projects. Therefore, there is no increased probability for wolf fatalities from train traffic as a result of the proposed projects.

The proposed projects would also have a potential specific increase in disturbance related to the improvement and use of three existing mine haul roads (see Section 2.6). As described in the 1992 Recovery Plan for the Eastern Timber Wolf, roads and the access they provide into wolf habitat are important factors when assessing the potential effects of an action. Two adverse effects related to roads in wolf habitat are the potential for vehicle-wolf collisions, and the access they provide for humans into wolf habitat who would intentionally or unintentionally kill wolves. The recovery plan authors state that new roads are of greater concern than improvements to existing roads, and they also emphasize the effects of increased human access to wolf habitat over those of collisions. The recovery plan provides a threshold of one linear mile of public road per square-mile as an upper acceptable limit of public road density in wolf habitat. Although CSAH 70 would be a new alignment, the current roadway would be removed by the mine progression and would meet the criteria of one linear mile of road per square-mile.

The improvement of the existing haul roads and relocation of CSAH 70 under would not lead to an increase in road density in the action area. All roads on the mine site are closed to public access and any improvements to these roads would not lead to increased public access or intentional or accidental wolf kills by the public.

Based on the assessment that the projects would have significant effects to gray wolf habitat connectivity and that the potential for a wolf fatality under the projects is likely, the Corps has determined that the proposed projects may adversely affect the gray wolf.

The loss of gray wolf habitat would be 57.7 acres, which represents a 0.0005 percent loss of zone two critical habitats for the gray wolves in Western Great Lakes. This area is small relative to the typical home range of wolf packs in Minnesota, which can vary from 20 to 214 square miles. (Resources 2011b) In addition, the Western Great Lakes Population of gray wolves, which includes all of Minnesota, has been steadily increasing and has exceeded management goals. (U. S. Fish and Wildlife Service 2011) For these reasons, the home range of a wolf pack that includes the project site would not be appreciably affected by the proposed projects.

Based on the assessment that the projects would have insignificant effects to wolf critical habitat, the Corps has determined that the proposed projects may affect, but would not likely adversely affect gray wolf critical habitat. As discussed below, we

disagree and conclude that the projects will have some adverse effects on gray wolf critical habitat, but that gray wolf critical habitat will not be adversely modified by the action.

VI. CONCLUSIONS AND DETERMINATION OF EFFECTS

NSM is proposing to expand their mine facility near Babbitt, Minnesota, which will require a permit from the Corps under Section 404 of the Clean Water Act. In response to the mine progression, the St. Louis County Highway Department has proposed to relocate CSAH 70 to allow NSM to mine the mineral resources located under the current county road. The relocation of CSAH 70 will require a permit from the Corps under Section 404 of the Clean Water Act. Because both of these projects require a federal action, the Corps has prepared this biological assessment of potential project effects to federally-listed threatened and endangered species as required by Section 7 of the Endangered Species Act.

Two species currently listed as threatened have been recorded within the action area: the Canada lynx (*Lynx canadensis*) and the gray wolf (*Canis lupus*).

Based on the assessment that the projects would have significant effects to lynx habitat connectivity, that the potential for a lynx fatality under the projects is likely, and that the low resident lynx population would be negatively affected by potential increased fatality, the Corps has determined that the proposed projects may adversely affect the lynx. We agree with this assessment. Based on the assessment that the projects would have significant effects to gray wolf habitat connectivity and that the potential for a wolf fatality under the projects is likely, the Corps has determined that the proposed projects may adversely affect the gray wolf. We also agree with this assessment.

Based on the assessment that the projects would have insignificant effects to wolf critical habitat, the Corps has determined that the proposed projects may affect, but would not likely adversely affect gray wolf critical habitat. We do not concur with the determination that the proposed eastern progression of the open pit iron ore mine at the Northshore Mine and the proposed relocation of CSAH 70 may affect but will not likely adversely affect gray wolf critical habitat. Our nonconcurrency is based on these projects' impact on the wildlife corridor in the action area. Gray wolf prey density is not expected to decrease under this project, nor will the project increase permanent human population densities high standard road densities, which are important constituent elements of wolf critical habitat. However, your BA states that the project corridor and its connection to critical habitat, is what makes the action area unique. The BA further states that although it is likely that lynx and wolves would continue to utilize the smaller corridor in some fashion, its reduction by 50% is a significant effect to the mobility of the species within the immediate area. The BA also states that maintenance of the connectivity of the corridor is important because of the fragmented and noncontiguous nature of state and federal public land.

The proposed projects would adversely modify or destroy gray wolf critical habitat if they diminished the ability of the critical habitat to serve its intended conservation role for the species. In Minnesota, Management Zones 1, 2 and 3 are defined as critical habitat. They total 9,827 square miles of area in north-central and northeastern Minnesota. These areas provide food and cover for gray wolves in established packs and also for dispersing wolves. No specific primary constituent elements have been officially described for the gray wolf critical habitat in Minnesota; however, constituent elements of critical habitat should include space for population growth, normal behavior, nutritional or physiological requirements, shelter, and breeding. Essential features of gray wolf critical habitat are road and human population density and prey density. The proposed projects would not increase road density and would have only minimal effects on total forest cover. In addition, the proposed projects would not result in any significant change in human population or prey density across the 9,827 square-mile critical habitat area. With the implementation of Section 404 permitting by the Corps authorizing filling of wetlands for the proposed action, the Service concludes that gray wolf critical habitat would not be adversely modified and would remain functional to serve the intended conservation role for the gray wolf.

Effects of the Proposed Action

Effects of the action are defined as the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with the actions, that will be added to the environmental baseline (50 CFR §402.02).

This biological opinion does not rely on the regulatory definition of destruction or adverse modification of critical habitat at 50 C.F.R. 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to gray wolf critical habitat.

DIRECT AND INDIRECT EFFECTS

Habitat Loss- Canada lynx

Direct and indirect effects upon the lynx may result from the reduction and or degradation of suitable boreal forest habitat to a bare ground (rock) environment.

As stated previously, lynx require large areas containing boreal forest habitat. In the northeastern U.S., lynx were most likely to occur in areas containing suitable habitat that were greater than 100 km² (24,710 acres) (Hoving 2001) The requirement for large areas also is demonstrated by home ranges that encompass between approximately 20 (4,942 acres) and 150 km² (37,066 acres) of suitable habitats. (Moen et al. unpubl. data)

Because the surface mining of taconite ore and the production of iron ore pellets is a land-intensive operation, the Service is anticipating that any habitat type within the progression areas would be rendered unsuitable for occupation by lynx. The proposed action

encompasses 57.7 acres of lynx habitat. However, when the impact area is compared to both the surrounding landscape and suitable habitat necessary for a single home range, the overall impact is relatively minor in scope.

Vehicle Collisions

Direct effects upon the lynx may result from vehicle collisions. Vehicle collisions have been documented in Minnesota (see table below) and other states. Right-of-way widths and vehicle speeds are conditions that likely contribute to this apparent vulnerability. Traffic volume is also a critical factor in determining the magnitude of road kill. Lode (2000), for example, found that road kill increased exponentially with traffic volume. Two lynx have been killed on the railroad operated by NSM Mining in the action area – one in December 2001 and another in April 2005. None of the roadkill events described below took place in the action area.

Record of Canada lynx Roadkill in Minnesota (since listed in 2000)

Date	County	Road Type	Road Surface	Speed Limit	Road Number	Road Jurisdiction	Comments
7/2/2003	Cook	Secondary	Paved	46-60 mph	County 12	County	Along Gunflint Trail
8/1/2003	Marshall	Secondary	Paved	Unknown	County 54	County	Date approximate
7/1/2004	Cook	Highway	Paved	46-60 mph	TH 61	State	Date approximate
12/10/2004	Pine	Highway	Paved	61 mph+	I-35	Federal	
4/20/2005	Lake	Forest	Gravel	26-45 mph	FR 172	Forest	L2, Wanless Road
3/3/2009	St. Louis	Highway	Paved	65 mph	Hwy 53	Federal	

Habitat loss – gray wolf

Direct and indirect effects upon the gray wolf may result from the reduction and or degradation of suitable general forest habitat to a bare ground (rock) environment. Gray wolves are known to occur within the action area and have been observed there many times over the past ten years. The action area is located within gray wolf critical habitat. Wolves have also been observed at other mine sites on the Iron Range. Based on this information, gray wolves near the action area and along the Iron Range are tolerating a certain amount of human disturbance and mining activity within their established territories. (Resources, Gray Wolf/Timber Wolf, *Canis lupus*, 2011)

Because the surface mining of taconite ore and the production of iron ore pellets is a land-intensive operation, the Service is anticipating that any habitat type within the progression areas would be rendered unsuitable for occupation by gray wolf. The proposed actions of

mine and stockpile expansion along with the relocation of CSAH 70 would result in a direct loss of 57.7 acres of gray wolf habitat. However, when the impact area is compared to both the surrounding landscape and suitable habitat necessary for a single home range, the overall impact is relatively minor in scope.

Vehicle Collisions

The improvement and relocation of CSAH 70 would lead to greater risk of wolf fatalities through vehicle collisions as a result of increased traffic as a result of the mining progression and upgraded roadway. Within what would be the remaining corridor, the wolf could either travel within the 550-foot forested area or along the CSAH 70 roadway, right-of-way, and snowmobile trail. It is probable that wolf may prefer to use the roadway and right-of-ways for convenience. This increases the likelihood that a vehicle traveling at 50 mph along CSAH 70 could hit and kill a wolf. Mine trucks travel at a slower speed (maximum average speed is about 30 mph), are larger, and louder than vehicles on public roads, likely making them easier for wolves to detect and avoid. (Northshore 2011, St. Louis County Highway 2011, Engineering 2009, Resources 2011b). There will likely be increased mortality of gray wolves crossing the upgraded CSAH 70 or from gray wolves using CSAH 70 as a travel corridor. This increased mortality will be due to collisions with vehicles using the realigned CSAH 70.

EFFECTS OF INTERRELATED OR INTERDEPENDENT ACTIONS

Interrelated actions are those that are a part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. There are no actions other than those considered under Direct and Indirect Effects that will have effects to lynx and gray wolves as a result of the proposed action.

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. The Service knows of no activities within the action area (existing or proposed) that are not subject to independent consultation or that have not already been included in this opinion.

As detailed below, the proposed projects may result in loss of one Canada lynx every 50 years. Populations of lynx in the contiguous United States also occur in portions of Colorado, Idaho, Maine, Montana, and Washington. Therefore, the estimated proportional impacts to lynx in the contiguous United States would be less than that anticipated for the species in Minnesota alone. This level of impact would not result in an appreciable effect on the survival and recovery of Canada lynx in the contiguous United States

The proposed projects may also result in the loss of one gray wolf (excluding the nonessential experimental populations) every 50 years. This is unlikely to result in any appreciable effects on the survival or recovery of wolves in Minnesota or in the lower 48 States.

VII. CONCLUSION

After reviewing the current status of Canada lynx and the gray wolf, the environmental baseline for the action area, the effects of the proposed action (take of one lynx over the 50-year life of the project and take of one gray wolf over the 50-year life of the project) and cumulative effects, it is the Service's biological opinion that the proposed projects are not likely to jeopardize the continued existence of the Canada lynx or the gray wolf. It is also the Service's biological opinion that the proposed projects are likely to adversely affect gray wolf critical habitat but will not result in adverse modification of gray wolf critical habitat.

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.

1. the probability of mortalities to Canada lynx and gray wolf due to collisions is likely to be proportional to traffic volume,
2. traffic volume on the realigned CSAH 70 will be 1680 vehicles per day,
3. posted speed limit will remain at 45 mph, and,
4. the likelihood of gray wolf mortality can be expected to be directly proportional to gray wolf density in the vicinity of CSAH 70, which will approximate those found by Mech (2006) in the central part of Superior National Forest (0.04 wolves/km² [247 acres]).

Anticipated incidental take to gray wolf is based on a Wisconsin study mortality rate of 0.02 wolves/mile/year. (U.S. Fish and Wildlife Service 2009a) This rate was then divided by the proportional difference in traffic volume (4700 vehicles [WI study]/1680 from projected traffic on CSAH 70 = 2.80) and then multiplied by 6.7 to account for higher densities of wolves in the action area of northeastern Minnesota versus the Wisconsin study. This gives us the mortality rate for this proposed project of 18.76 wolves/mile/year. Multiply mortality rate by the number of miles of road to get the estimated number of wolves taken per year (0.02 wolves/year) and the result is an incidental take of 0.38 gray wolves taken per year for the proposed relocation of CSAH 70.

For purposes of estimating incidental take of gray wolves and Canada lynx, we will assume that the proposed projects will last for 50 years. With an estimate of 0.02 wolves hit by vehicles per year, we would estimate that the overall incidental take of the projects would be one gray wolf taken during the project life.

As stated above, lynx are also susceptible to being killed or injured as a result of traffic on the existing County Road 623. Since we do not have a study of vehicle mortality to lynx like the one used for gray wolf, we will assume that lynx are equally susceptible to being taken by vehicles as wolves and that the factors considered above for gray wolves will also determine the likely number of lynx taken, although we will use a different basis for estimating lynx density in the action area.

To estimate lynx density in the vicinity of CSAH 70, we assumed that there are approximately 1.3 females per male home range, based on weighted mean home ranges of 87 km² (21,298 acres) for males and 68 km² (16,803 acres) for females (Moen et al. 2006) and assuming continuous and non-overlapping home ranges among both males and females.

Therefore, we assume that there are 2.3 lynx per 87 km² (21,498 acres) (i.e. one male and 1.3 females in each male home range) – approximately 0.03 lynx/km² (247 acres). Although data are insufficient to estimate lynx density in the action area, this is likely a reasonable estimate. Lynx densities in the southern boreal forest, including Minnesota, are similar to those found in the taiga (the core of lynx range) during times of snowshoe hare scarcity (<3 lynx/100 km² [24,710 acres]).

We would predict greater densities in the action area if we assumed some degree of overlap among female home ranges, as has been demonstrated. (Mech 1980, Carbyn and Patriquin 1983) It is unclear; however, to what degree of overlap is likely to occur in the action area and even in regions where some lynx home ranges overlap there are likely some areas not included within any lynx's home range (i.e. unoccupied habitat). Therefore, our assumption of continuous home ranges would somewhat offset the negative influence on the predicted density resulting from our assumption of non-overlapping home ranges.

Based on the above assumptions regarding traffic volume, susceptibility to vehicle collisions, traffic speeds, lynx densities, and current likelihood of vehicle collisions; we estimate that the proposed actions will result in about one lynx getting taken by a vehicle on CSAH 70 every 50 years, which is the expected life of the project. The likely frequency of

lynx-vehicle collisions may be less than for gray wolves due to the lower predicted densities of lynx in the vicinity of CSAH 70. In addition, lynx populations fluctuate markedly during approximately 10-year cycles, whereas gray wolf densities will likely be relatively stable. Therefore, the probability of lynx getting hit by vehicles on CSAH 70 will likely vary in proportion to lynx density throughout the population cycle.

Data are currently insufficient to accurately estimate lynx densities in Minnesota, but the assumptions used above to arrive at an estimate of one dead lynx every 50 years also allows us to estimate the proportional impact to the lynx population. To estimate lynx density at $0.03/\text{km}^2$ [247 acres] in the action area, we assumed that lynx home ranges were continuous and non-overlapping within sexes, i.e. female home ranges did not overlap with other female home ranges and were continuous across the landscape. We made the same assumption for males. Lynx Analysis Units (LAUs) and the Boundary Waters Lynx Refugium (BWL) cover approximately $12,700 \text{ km}^2$ (3.14 million acres) and represent the approximate area occupied by lynx in and around the Superior National Forest. For the purposes of this analysis, we will assume that this is the approximate area occupied by lynx in Minnesota. There are areas within LAUs that are unsuitable for lynx, but lynx also occur in Minnesota beyond the area contained within LAUs and the BWL (including the action area); therefore, this may be a fair approximation of total lynx range in Minnesota. If lynx occur throughout the area contained within LAUs and the BWL at a density of 0.03 km^2 (7.4 acres) then there are approximately 381 lynx in this area. If one lynx is killed every 50 years, this would represent an approximate loss of 0.3 percent of the lynx population, once every 50 years. As stated above, lynx abundance likely varies greatly over an approximately 10-year cycle. Therefore, the loss of one lynx would have a greater proportional effect during low phases of the population cycle. Low lynx densities during this period; however, would also proportionally lower the likelihood of a lynx getting hit by a vehicle on CSAH 70. Thus, the loss of one lynx during the life of this project is not likely to have an appreciable effect on the lynx.

EXTENT OF THE INCIDENTAL TAKE

The Service has determined that the loss of one individual Canada lynx and one individual gray wolf over the next 50 years of the subject action will not jeopardize the continued existence of these listed species. Should information become available that indicates the incidental take limit has been exceeded, consultation must be reinitiated. [50 CFR §402.14(i)(3)].

EFFECT OF THE INCIDENTAL TAKE

We conclude that the anticipated incidental take is not likely to jeopardize the continued existence of the Canada lynx and that the anticipated incidental take is not likely to jeopardize the gray wolf. We also conclude that the anticipated incidental take is likely to adversely affect gray wolf critical habitat but will not result in adverse modification of gray wolf critical habitat.

REASONABLE AND PRUDENT MEASURES

Reasonable and prudent measures are intended to minimize the impacts of the anticipated incidental take, but cannot alter the basic design, location, scope, duration, or timing of the action and may involve only minor changes. The following reasonable and prudent measures are necessary and appropriate to minimize anticipated incidental take to Canada lynx and gray wolves:

1. Implement monitoring and reporting to assist the Service in assessing impacts from these projects. The Corps must ensure that the reporting and monitoring requirements, described below, are implemented for ten years following the issuance of the permit.
2. The St. Louis County Highway Department will implement a speed limit reduction through the realigned CSAH 70 corridor to reduce vehicle collisions with both Canada lynx and gray wolf.
3. The St. Louis County Highway Department will implement the removal of road-killed deer or moose along CSAH 70 to limit the likelihood of Canada lynx or gray wolves feeding on carrion on or near the highway.
4. The St. Louis County Highway Department will reduce the disturbance by all-terrain-vehicle (ATV) and snowmobile riders using the relocated ATV trail along realigned CSAH 70.
5. NSM will develop and implement a management plan to benefit Canada lynx and gray wolves using the action area.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Corps of Engineers must comply with the following terms and conditions, which outline reporting and monitoring requirements and implement the reasonable and prudent measures described above.

Reporting/Monitoring Requirements

1. Any vehicle collisions with gray wolves or Canada lynx must be reported by the St. Louis County Highway Department within 72 hours to the Twin Cities Ecological Services Field Office, U.S. Fish and Wildlife Service, Bloomington, Minnesota (612-725-3548). These reports shall include all known information regarding the incident, including the species involved, date of incident, fate of the animal (*e.g.*, dead), location of the carcass, geographic coordinates of the accident location, sex of the animal, and approximate age (*i.e.*, adult, juvenile, yearling).
2. The Corps shall establish a procedure in which NSM and the St. Louis County Highway Department establishes a reporting office with a specifically designated

contact, where reports can be submitted regarding sightings of lynx (*i.e.* anecdotal reports of sightings or incidences of take). This information should be summarized and provided to the Corps on an annual basis by the applicants.

3. The Corps shall provide to the Service an annual report that shall be a compilation of all data gathered during the monitoring effort by the applicants. The Corps is encouraged to contact the Service more frequently, if it is determined that NSM or the St. Louis County Highway Department would benefit from this assistance. The initial point of contact for this purpose is Nick Rowse, biologist, U. S. Fish and Wildlife Service, at telephone number 612-725-3548, extension 2210, or by email at nick_rowse@fws.gov. If more exigent circumstances present themselves (*i.e.*, the take of a Canada lynx), the Corps should contact the Service immediately.
4. NSM shall report via email any sightings of lynx or bobcat that are observed within the newly expanded area of the Northshore Mine that is adjacent to the realigned CSAH 70. The initial point of contact for this purpose is Nick Rowse U.S. Fish and Wildlife Service, at telephone number 612-725-3548, extension 2210, or by email at nick_rowse@fws.gov. The information on the two following websites could be used for this purpose:
 - a. Lynx – <http://www.nrri.umn.edu/lynx/information/bobcat.html> (see Appendix 1)
 - b. Wolf – http://www.wolf.org/wolves/learn/basic/wolves_humans/pdf/wh_was_that_a_wolf.pdf (see Appendix 2)

Reduction of speed limit through project area

1. The St. Louis County Highway Department will post a 45 mile-per-hour speed limit throughout realigned section of CSAH 70. This will reduce vehicle collisions with both Canada lynx and gray wolf. Speed limit signs will be posted along this section as per County Highway regulations.

Removal of roadkill along CSAH 70

1. The St. Louis County Highway Department will promptly remove (within 48 hours of their discovery) any deer or moose killed by vehicles on CSAH 70 to limit the likelihood of Canada lynx or gray wolves feeding on carrion on or near the highway. Deer or moose carcasses will be picked up and removed within 66 feet of the centerline of CSAH 70.

Minimization of disturbance by ATVs and snowmobiles

1. Disturbance by ATV riders and snowmobilers using the relocated ATV trail along realigned CSAH 70 will be minimized through the use of information signs to be posted by the St. Louis County Highway Department at the junctions of the ATV trail with CSAH 70 . The signs will inform ATV and snowmobile riders to remain on the ATV trail for the purpose of minimizing impacts to wildlife species using the vegetated corridor adjacent to the trail. The St. Louis County Highway Department will coordinate with the MNDNR to implement this term and condition.

Management plan for Canada lynx and gray wolves

1. A management plan for Canada lynx and gray wolves will be developed and implemented on NSM property using Appendix E from the Final Forest Plan, U.S. Forest Service (2004) as guidance. This management area will be implemented on NSM property within the following legal descriptions, all within Township 60 North, Range 12 West, St. Louis County, Minnesota:

The Northwest Quarter of the Southwest Quarter of Section 10
The Southwest Quarter of the Southwest Quarter of Section 10
The Northeast Quarter of the Southwest Quarter of Section 10
The Southeast Quarter of the Southwest Quarter of Section 10
The Northwest Quarter of the Southeast Quarter of Section 10
The Southwest Quarter of the Southeast Quarter of Section 10

Following the future sale or transfer of this property by NSM, the management plan would no longer be in effect.

VIII. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act, directs 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 programs, or to develop information.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their or their habitats, the Service requests notification of the implementation of any conservation recommendations.

Winter Track Surveys

1. The Service recommends that the applicants conduct a winter track survey following the the eastern progression of the Northshore mine and construction of the realigned CSAH 70. This would allow the hard data collected to be combined with the anecdotal information so that the Service can achieve a better understanding of lynx in the vicinity of the project area.

Mine Land Reclamation

1. The Service recommends that the applicant prepare and submit a mine lands reclamation plan for the areas being impacted by the eastern mine progression. The Service further recommends that all areas to be re-established be done so using native trees, forbs and grasses. Any seed mixes used should be appropriate to the eco-region.

IX. REINITIATION -- CLOSING STATEMENT

This concludes consultation on the proposed actions as described in the two Public Notices dated February 1, 2011 and February 16, 2011, regarding the section 404 permit for the progression of the NSM Mine and the relocation of CSAH 70 in St. Louis County, Minnesota. 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 take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; and, (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. Chapter 3. In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.
- 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.
- Corps of Engineers, U. S. 2010. Keetac Expansion Project, Biological Assessment. St. Paul. III.
- Engineering, B. 2009. Cumulative Effects Analysis of Wildlife Habitat and Threatened and Endangered Wildlife Species: Keetac Expansion Project. Minneapolis.
- Henderson, C. 1978. Minnesota Canada lynx status report, 1977. *Minnesota Wildlife Research Quarterly* 38:221-242.
- Hoving, C.L. 2001. Historical occurrence and habitat ecology of Canada lynx (*Lynx canadensis*) in eastern North America. M.S. Thesis, University of Maine.
- Koehler, G.M. 1990. Population and habitat characteristics of lynx and snowshoe hares in north-central Washington. *Canadian Journal of Zoology* 68:845-851.
- Koehler, G.M., and K.B. Aubry. 1994. Chapter 4: Lynx. Pages 74-98 in American Marten, Fisher, Lynx, and Wolverine in the Western United States, L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, L.J. Lyon, W.J. Zielinski, editors. U.S. Forest Service, General Technical Report RM-251.
- Koehler, G.M., and J.D. Britnell. 1990. Managing spruce-fir habitat for lynx and snowshoe hares. *Journal of Forestry* 88:10-14.
- Lode, T. 2000. Effect of a Motorway on Mortality and Isolation of Wildlife Populations *Ambio* 29:163-166.
- McCord, C.M., and J.E. Cardoza. 1982. Bobcat and lynx. In J.A. Chapman and G.A. Feldhamer, editors. *Wild mammals of North America biology, management and economics*. Johns Hopkins University Press, Baltimore, Maryland.
- McKelvey, K.S., K.B. Aubry, Y.K. Ortega. 2000. History and distribution of lynx in the contiguous United States. Chapter 8. In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. Ecology and conservation of lynx in the United States. University Press of Colorado, Boulder.

- Mech, L.D. 1977. Record movement of a Canadian lynx. *Journal of Mammalogy* 58:676-677.
- Mech, L.D. 1980. Age, sex, reproduction, and spatial organization of lynxes colonizing northeastern Minnesota. *Journal of Mammalogy* 61:261-267.
- Mech, L. D. 2006. Wolf numbers in the central Superior National Forest, Winter 2005-2006. USGS - Biological Resources Division, St. Paul, MN. 4 p.
- Minnesota Department of Natural Resources, E. S. 2011. Laurentian Uplands Subsection. Retrieved May 20, 2011, from <http://www.dnr.state.mn.us/ecs/212Le/index.html>.
- Moen, R., G. Niemi, C.L. Burdett, and L. D. Mech. 2004. Canada lynx in the Great Lakes region. Natural Resources Research Institute, University of Minnesota, Duluth, MN. 29 p.
- Moen, R., G. Niemi, C. L. Burdett, and L. D. Mech. 2006. Canada lynx in the Great Lakes region: 2005 annual report to USDA Forest Service and MN Cooperative Fish and Wildlife Research Unit and Minnesota Department of Natural Resources. in. Natural Resources Research Institute, Duluth, MN. 28 p.
- Moen, M. P. 2008. Canada Lynx in the Great Lakes Region. Duluth: Center for Water and Environment, Natural Resources Research Institute.
- Moen, R. P. 2009. Canada Lynx in the Great Lakes Region – 2009 Annual Report. Duluth: Center for Water and Environment, Natural Resources Research Institute.
- Moen, R., G. Niemi, C. L. Burdett, and L. D. Mech. 2008. Canada lynx in the Great Lakes region: Final report to USDA Forest Service and MN Cooperative Fish and Wildlife Research Unit and Minnesota Department of Natural Resources. in. Natural Resources Research Institute, Duluth, MN. 52 p.
- Moen, R. P. 2010. Habitat and road use by Canada lynx making long-distance movements. Duluth Center for Water and Environment, Natural Resources Research Institute.
- Murray, D. L. 2000. A geographic analysis of snowshoe hare population demography. *Canadian Journal of Zoology/Revue Canadien de Zoologie* [Can. J. Zool./Rev. Can. Zool.]. 78:1207-1217.
- Northshore, M. C. 2011. Draft Environmental Assessment. Babbitt: Barr Engineering.
- 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.
- PolyMet Mining Company, I. 2006. 2006 Canada Lynx Assessment: Final Report. ENSR Corporation.
- Resources, M. D. 2006. Cumulative Effects Analysis on Wildlife Habitat and Travel Corridors in the Mesabi Iron Range and Arrowhead Regions of Minnesota. Emmons & Olivier Resources, Inc.
- Resources, M. D. 2011a. Canada Lynx, *Lynx canadensis*. Retrieved May 20, 2011, from <http://www.dnr.state.mn.us/mammals/canadalynx.html>
- Resources, M. D. 2011b. Gray Wolf/Timber Wolf, *Canis lupus*. Retrieved May 20, 2011, from <http://www.dnr.state.mn.us/mammals/graywolf.html>.
- Ruediger, B. E. 2000. Canada Lynx Assessment and Conservation Strategy. Missoula: United States Fish and Wildlife Service, U. S. (2011, March 29). Endangered Species in Minnesota County Distribution of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species. Retrieved May 3, 2011, from <http://www.fws.gov/midwest/endangered/section7/spranges/minnesot-cty.html>.
- Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, J.R. Squires. 2000. The scientific basis for lynx conservation: qualified insights. In Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al., tech. eds. The scientific basis for lynx conservation in the contiguous United States. Gen. Tech. Rpt. RMRS-GTR-30. Ogden, UT: U.S. Dept. Agriculture, Forest Service, Rocky Mountain Research Station.
- Squires, J.R., and T. Laurion. 2000. Lynx home range and movements in Montana and Wyoming: preliminary results. Chapter 11. In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, technical editors. *Ecology and conservation of lynx in the United States*. University Press of Colorado, Boulder.
- Squires, J.R., S. Tomson, L.F. Ruggiero, 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.
- St. Louis County Highway. 2011. Wetland Application. Duluth: Barr Engineering
- United States Fish and Wildlife Service. 1992. Recovery Plan for the Eastern Timber Wolf. Revised 1992, 73pp.
- United States Fish and Wildlife Service. 2009a. Biological Opinion, Mesabi Nugget, Prevention of Significant Deterioration Permit, U.S. Environmental Protection Agency.

United States Fish and Wildlife Service. 2009b. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada lynx. Federal Register 50 CFR Part 17. 88pp.

United States Fish and Wildlife Service, U. S. 2011. Proposal to Remove ESA Protection for Gray Wolves in Western Great Lakes DPS and the National Wolf Strategy. Retrieved May 5, 2011, from <http://www.fws.gov/midwest/wolf/delisting/index.htm>.

United States Department of Agriculture, F. S. 2011. Land & Resources Management. Retrieved May 20, 2011, from http://www.fs.usda.gov/wps/portal/fsinternet!/ut/pc4/04_SB8K8xLLM9MSSzPy.

United States Geological Survey, L. C. 2006. NLCD 2006 LandCover. Retrieved May 20, 2011, from http://www.mrlc.gov/nlcd2006_downloads.php.

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

U.S. Forest Service. 2004. Appendix E. Canada lynx in Final Forest Plan – Superior National Forest. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm91_050609.pdf

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.