Inga South Project Biological Assessment

1.0 Introduction

This Biological Assessment (BA) documents the potential effects of the proposed vegetation management project and associated activities as documented in the attached Inga South Environmental Assessment (USDA Forest Service 2005) on federally proposed, candidate, threatened or endangered species and designated critical habitat.

This BA was prepared in compliance with the requirements of Forest Service Manual Directives sections 2670.31, 2670.5(3), and 2672.4, the Endangered Species Act of 1973 as amended, and the National Forest Management Act of 1976.

Information provided by the USDI Fish and Wildlife Service (USDI FWS 2005. Letter from Field Supervisor Dan Stinnett Oct. 3rd, 2005) confirms the species and critical habitat that should be considered for projects conducted on the Superior National Forest (SNF):

- Bald eagle (threatened), with no designated critical habitat
- Gray wolf (threatened), with designated critical habitat
- Canada lynx (threatened), with proposed critical habitat

2.0 Consultation with USDI Fish and Wildlife Service

The Forest Service has initiated consultation with the Fish and Wildlife Service (FWS) seeking concurrence with the determination of effects in this BA, which concludes that **Alternative One "may affect, but is not likely to adversely affect" bald eagle, gray wolf, and Canada lynx and is "not likely to adversely affect" critical habitat for gray wolf.**

In addition to consultation for eagle, lynx, and wolf requested for this project, programmatic consultation was recently undertaken for Forest Plan revision. The history of this consultation is documented in the Programmatic Biological Assessment for the revision of the forest plans (USDA Forest Service 2004, pp. 6-7). This BA tiers to the Programmatic Biological Assessment with respect to defining elements of species' ecology and biology, risk factors and general effects, analysis parameters, monitoring, and management direction in the revised Forest Plan. This BA provides more specific information on how relevant information in the program-level BA is incorporated. Additionally, other factors relevant to this project that were not discussed in detail in program-level consultation will be discussed in detail in this BA.

Consultation specific to the Inga South Project is documented in the project file. It includes emails, telephone calls, meeting notes between June 2005 and December 2005, and the submission of the BA to the FWS.

3.0 The Proposed Action:

- **Location**: Superior National Forest, Tofte Ranger District, Lake County, Minnesota (Chapter 1, See figure 1-1 on page 1-1 of Inga South Project EA for vicinity map).

  - **Ecological Setting**:

Landscape Ecosystem	**Percent of Project Area**	**Acres**
Dry-mesic red and white pine	75%	21,345
Mesic Birch Aspen	15%	4,171
Lowland conifer	8%	2,258
Other	2%	630
Watershed (Sixth Level)	**Percent of Project Area**	**Acres**
Little Isabella River	55%	23,033
Mitawan Creek	16%	6,859
Stony River, Middle	11%	4,808
Other watersheds (Manitou River, Upper Stony River, Coyote Cr, Dumbbell R, Lower Island R,	<5% each	

  - **Overview of species' Affected Environment:**

Eagle	**Total #**
Lakes >20 ac	14
Fish-bearing Streams	2
Wolf	**Percent of Project Area**
Zone 1	61%
Zone 2	39%
Zone 3	0
Zone 4	0
Lynx	**Percent of Project Area**
LAU19	32%
LAU20	59%
Other LAUs	9%
Lynx critical habitat	None in project area

- **Other relevant setting features:**
  The Inga South project area is located in the southern portion of the Inga-Isabella 5th level watershed and is approximately 41,974 total acres in size. The project is in the Tofte District and is bisected by Minnesota State Highway 1. It is located in Lake County, Minnesota, in Townships 59 and 60 North, Ranges 7-10 West. Notable water features in the project area include Mitawan, Kitigan, Flathorn, Gegoka, Eighteen, Delay, Dumbbell, and the McDougal Lakes; the Little Isabella River, and numerous creeks including Hill and Trapper's. The town of Isabella is within the southeastern portion of the project area (Population = 166).

- **Proposed action summary**
  The USDA Forest Service Superior National Forest (SNF) proposes timber, road system and fuel reduction management activities. The modified proposed action and its 2 alternatives (including no action) are described in Chapter 2 of the Inga South Project EA (Sect. 2.3 and 2.6). The proposed mitigations and design features are listed in Appendices C and D of the Inga South EA and Section 6 of this BA. The action alternatives include the following activities in different amounts and locations:

  - Timber harvest: Includes even-aged and uneven-aged harvest methods. Actual treatment acres will be less than the stand acres disclosed in the EA due to mitigations for soils, visuals, wildlife and other resources.
  - Reforestation: Includes site prep, under planting, seeding, conversion planting from aspen forest to pine forest, and release of advanced regeneration.
  - Non-harvest restoration: Includes timber stand improvement activities including planting and releasing desired species
  - Road management: Includes adding existing unclassified roads to the managed road system, decommissioning existing unclassified roads and system roads, temporary (temp) road construction and converting 0.3 miles of unclassified road to a special use permit.
  - Hazardous fuel reduction: Includes reduction of understory fuels (predominantly brush and balsam fir saplings) through mechanical removal, hand-pile and burning or understory burning.

- **Purpose of the action:**
  The purpose of the action is to implement the Forest Plan and is described in Chapter 1 of the Inga South Project EA (See Section 1.3 and 1.4).

- **Time frame of the action:**
  All of the management activities are expected to be implemented during the next ten years. Some activities may be started by the end of 2006 and may be

completed before other projects would be started. The harvest activities would occur throughout all seasons. Some units have specific harvest times such as winter or summer because of mitigations. Season of harvest is identified for each harvest unit. The reforestation activities would not occur until after completion of the harvest. Some of the road decommissioning would occur after completion of harvest as some of the roads proposed for decommissioning are needed for access.

Project activities analyzed in program-level BA

Proposed actions	**Alt. 1**	Alt. 2 – No Action	Alt. 3	Addressed in Program-level BA?
Timber Harvest	**x**	NA	x	yes
Reforestation	**x**	NA	x	yes
Non-harvest restoration	**x**	NA	x	yes
Road Management	**x**	NA	x	yes
Fuel Reduction	**x**	NA	x	yes

4.0 Status of Species

4.1. Bald Eagle

Ecology (see section 2.3 of program-level BA)

- **Terrestrial Habitat**: No new information
- **Aquatic Habitat**: No new information
- **Diet**: No new information

Population Status (see section 2.4 of program-level BA)

- **Breeding population/trend in United States**: No new information
- **Breeding population/trend in Minnesota**: No new information
- **Breeding population/trend in the Superior National Forest**: No new information
- **Wintering population/trend (United States, Minnesota, Superior National Forest):** No new information

Population Status in Project Area:

- **Project area site-specific surveys**: None. However, in spring of 2005, occupancy survey flights were flown over the project area as part of a State-wide effort to monitor historic nests as well as to document new nests.
- **Occupied habitat:** There are 2 known bald eagle nests within the project area (Grouse Lake and Dumbell Lake) and one additional stick nest (Delay Lake) that is believed to be eagle or osprey. The two eagle nests on Grouse Lake and Dumbell Lake were active in 2005. The Delay Lake

stick nest was discovered in 2004 but was not active in 2004 or 2005. There are no known osprey nests in the project area. It is important to note osprey nest because eagles are known to use the nest of osprey.

- **Potential unoccupied habitat**: There are 16 lakes and streams within the project area that provide suitable foraging habitat (fish bearing waters greater than 20 acres). Within the project area, there are roughly 4,000 acres of upland forest on NFS lands within 1/2 mile of suitable foraging waters that have the potential to support nesting or roosting eagles.
- **Proximity of known use**: See occupied habitat above

Factors Affecting Eagle Environment (see section 2.5 of program-level BA)

- **Terrestrial habitat (habitat loss, forest management, etc):** On the SNF old growth white and red pine is considered to have a minimum age of 120 years (USFS 1992). Consider changing indicator 2b for old-growth forest from >100 years to >120 years. This change would provide better consistency with Management Indicator Habitats and SNF old-growth definitions.
- **Aquatic habitat (changes in aquatic prey base, etc.):** No new information
- **Human Disturbance (forest management, roads, recreation activities, trauma, etc.):** No new information
- **Other factors:** No new information

4.2 Gray Wolf

Ecology (see section 3.3 of program-level BA)

- **Breeding habitat** : No new information
- **Home range and dispersal**: No new information
- **Diet**: No new information

Population Status (see section 3.4 of program-level BA)

- **North America and Minnesota**: No new information
- **Chippewa and Superior National Forests**: No new information
- **Summary of wolf mortality in Minnesota**: No new information

Population Status in Project Area:

- **Project area site-specific surveys**: None. However, several packs tracked by the Minnesota Wolf Project are monitored in the project area.
- **Occupied habitat:** 3 known pack territories overlap the project area, with several known/historically used den-sites. Den sites vary and consist of rock crevasses, blow-down patches, underground dug dens, and depressions on the ground. Primary prey (deer and moose) numbers are high and do not appear to be a limiting factor. Wolves have continued to occupy the area in low prey years. (M. Nelson pers. comm. 11/15/2005).
- **Proximity of known use**: see occupied habitat above

Factors Affecting Wolf Environment

- **Prey habitat:** No new information
- **Human access:** The most critical period for denning wolves is late April through May (M. Nelson pers. comm. 7/12/2005, Dunka BA).
- **Other factors:** No new information

4.3 Canada Lynx:

Ecology (see section 4.3 of program-level BA)

- **Home range and dispersal**: No new information
- **Diet**: No new information
- **Den site selection**: No new information
- **Mortality**: No new information
- **Interspecific relationships with other carnivores**: No new information
- **Population dynamics**: No new information

Population Status (see section 4.4 of program-level BA)

- **North America**: No new information
- **Minnesota**: No new information
- **Chippewa and Superior National Forests**: No new information
- **Minnesota's lynx-hare cycles**: No new information

Population Status in Project Area:

- **Project area site-specific surveys**: The Forest Service is an interagency partner in an ongoing lynx telemetry study. Lynx across the forest have been tracked, trapped and fitted with GPS or VHF collars. Collared lynx have been reported using the project area and there are incidental sightings of lynx on file including reports of lynx with kittens (Lynx sightings shapefile 8/15/05). See occupied habitat below.
- **Occupied habitat**: There are over 2,665 telemetry locations from collared animals in the analysis area from 8 individuals (5 males, 3 females). The majority of the telemetry locations (99%) are from three individual animals (Inga_clip.shp, 7/20/2005). Individual lynx were documented using habitats within the analysis area anywhere from a few days to several months. Locations are fairly well distributed throughout the analysis area. One collared female (L14) is known to den in the project area (LAU 20) with one den location in 2004 and two locations in 2005 (R. Moen pers. comm. 9/6/2005, C.Burdett 12/09/2005)
- **Potential unoccupied habitat**: Most of the project area provides potential habitat which may or may not be occupied. All habitats are well distributed across the analysis area. All denning habitat in patches greater than 5 acres are within 3 miles of adequate foraging habitat.
- **Proximity of known use:** See occupied habitat above.

Factors Affecting Lynx Environment (see section 4.5 of program-level BA)

- **Roads and trails**: No new information
- **Winter dispersed recreation**: No new information
- **Trapping and shooting**: No new information
- **Vehicle collisions**: At least 3 lynx have been documented to have been hit by trains in northern Minnesota in the past 3 years. Consideration should be given to include trains as a mortality risk factor.
- **Other factors**: The most critical period for denning Canada lynx is late April through July (R. Moen pers. comm. 7/20/2005, Dunka BA).

5.0 Affected Environment and Environmental Consequences

5.1 EAGLE:

A. Analysis Area:

- **Direct/Indirect Effects Analysis Area:**
  - *Habitat indicators*: Analysis area for Forest Plan Programmatic BA Indicators is the project area. Analysis area for additional project level indicators is 1/4 mile from known nests within the project area.
  - *Human Disturbance indicators:* Analysis area for Forest Plan Programmatic BA indicators is the project area.

- **Cumulative Effects Analysis Area and Actions Considered:**
  - **ESA -** Analysis for ESA cumulative effects considers past, on-going and reasonably foreseeable future (10 years) State, County and private activities within the project area. Past actions are taken into account in the existing conditions (See Inga South EA, Appendix F). Reasonably ongoing and foreseeable future actions include 32 acres of timber harvest on State land, very little or no harvesting on Lake County or Potlatch/Northwest Paper lands and an unknown amount of harvesting on other private lands (See Inga South EA, Appendix F).

  - **NEPA -** Analysis for NEPA cumulative effects considers past, on-going and reasonably foreseeable future (10 years) State, County, private and federal activities within the project area. Past federal actions are taken into account in the existing condition. On-going federal timber sales that have been sold but not harvested include 81 acres of pine thinning (from Red Pine and White Spruce Thinning and East Side Thinning EAs). There are no other reasonably foreseeable Forest Service vegetation management actions in the project area at this time. The Tomahawk Trail Victor Lake By-pass Environmental Assessment is currently being developed. The range of alternatives includes a maximum of 1.16 acres of clearing for a new snowmobile trail location (3,168 feet length multiplied by 16 feet width) and 0.6 miles of additional trail grooming (1.6 miles new minus 1.0 mile old). The Lake County Wildfire Protection Plan addresses long-term fuels and fire-related management needs

within the Wildland Urban Interface but does not include site-specific management actions. All reasonably foreseeable fuels and fire-related management needs are included in the Inga South EA. We anticipate issuing a special use permit for access on an existing road (U7MN101) to two private land parcels. The interdependent indirect effect of issuing this permit could include future timber harvest on these land parcels (Total of 240 acres of black spruce, pine and coniferous/deciduous . mix). See listing under ESA above for other known future State, County and private activities considered in this analysis.

Rationale for analysis areas and time frames: The appropriate scale for cumulative effects is the project scale because the concern for negative impacts comes primarily from human disturbance which is best measured at the site-specific scale. Human access effects of this project will not go beyond the project area scale, therefore cumulative effects should be measured at this scale. The programmatic BA and Forest Plan BA (USDA 2004b) covered cumulative effects to eagle habitat across a broad landscape and effects to eagle habitat are similar at the project scale. A reasonably foreseeable future timeframe of ten years is appropriate because it includes all known future projects and provides a reasonably reliable estimate of what is expected to happen. The ¼ mile from known nests analysis area is identified in the Northern States Bald Eagle Recovery Plan (NSBERP) as an appropriate scale to consider direct effects of disturbance to nesting eagles. Per ESA Section 7 Consultation Handbook, cumulative effects are to be considered in the action area (for purpose of this analysis, action area = project area).

B. Effects Analysis for Bald Eagle:

The following indicators were chosen to analyze the direct and indirect effects of the action and the cumulative effects of other actions in the project area.

Indicators

Forest Plan BA Indicator	Use?	Rationale for exclusion
1. Acres and % of red and white pine type 0-9 yrs old (MIH 7 young)	Y	
2a. Acres and % of all red and white pine forest type (MIH 7)	Y	
2b. Acres and % of red and white pine forest 100+ yrs old	N	Nesting potential is measured with Indicator 6 below which is easily calculated as part of the MIH analysis
3. Miles of ATV trails	N	There are no trails designated as open to ATVs in the project area. This project does not propose any addition to the ATV trail system.
4. Miles of snowmobile trails	N	There are currently 24 miles of trails designated open to snowmobiles in the project area. These will remain open and do not vary by alternative.
5. Miles of temp and OML 1 and 2 roads	Y	
Other Indicators		**Rationale for inclusion**
6. Acres and % of old/old-growth red and white pine (120+)	Y	Nesting potential within the red and white pine types
7. Acres where white pine will be planted within ¼ mile of lakes > 20 acres.	Y	To measure O-WL-5

Habitat and Disturbance Indicators for Bald Eagle

Bald Eagle Indicators	Existing Condition		Acres and Percent of Habitat in 2015					
			Alt 1 Modified Proposed Action		Alt 2 No Action		Alt 3	
	acre	%	acre	%	acres	%	acres	%
1. Acres and % of red and white pine type 0-9 yrs old	147	0.7	950	4.5	0	0	441	2.1
2a. Acres and % of all red and white pine forest type	7,444	35	8,383	40	7,444	35	7,963	38
6. Acres and % of old/old growth red and white pine type	875	4.2	1,978	9.4	2,047	9.7	2,047	9.7
	Miles		Miles		Miles		Miles	
5. Miles of temp and OML 1 and 2 roads	90 (0.0, 22.1, 67.9)		100 (6.4, 23.6, 70.1)		90 (0.0, 22.1, 67.9)		98 (4.2, 23.6, 70.2)	
Other Indicators	acres	%	acres	%	acres	%	acres	%
7. Acres where white pine will be planted within ¼ mile of lakes > 20 acres.	0	0	1147	5.5	0	0	520	2.5
	Miles		Miles		Miles		Miles	

Data source: Existing condition for vegetation indicators are based on 2005 CDS data, and all alternatives are based on projected CDS data in the year 2016. Roads indicator data for Existing Condition and alternatives are based on GIS and INFRA database data

Other Footnotes: Percentages are based on the percent of total upland forest on federal lands in the project area (21,007 acres) for the dry-mesic-red-and-white-pine landscape ecosystem. For indicator 5, numbers in parentheses are the miles of each road type that make up the total for that indicator. *Note*: There are currently 10.1 miles of Forest Service jurisdiction unclassified roads in the project area. With the no action alternative all would remain open. With both action alternatives the unclassified roads would be decommissioned, converted to OML 1 or 2 roads, or used as temporary roads and then decommissioned resulting in 0.0 miles of unclassified.

C. Consistency with Forest Plan for Bald Eagle:

Forest Plan Guidance	Direction	Alts In Compliance	Basis for Compliance	Remarks
O-WL-4	Maintain or improve habitat	1-3	Based on mitigations and design features (Sect. 6). Habitat indicators 1, 2a, 6 and 7.	In Alternative 1 there is a partial harvest (269.20) proposed near the Delay Lake nest and a clearcut harvest proposed near the Dumbell Lake nest (254.41). In Alternative 3 the same partial harvest is proposed near the Delay Lake nest. The recommended mitigations would make alternatives 1-3 compliant with this objective. Acres of white pine type and within stand diversity are increased with all action alternatives.
O-WL-5	Seek opportunities to benefit TE spp.	1 and 3	Habitat indicators 1, 2a, 6 and 7.	Young pine of all types and young white pine within ¼ mile of lakes >= 20 acres will increase in both action alternatives. Mature pine will increase in all alternatives and create additional nesting structure. Alternative 2 (no action) will maintain mature pine but does not seek the opportunity to benefit eagles by planting pine for future habitat needs.
O-WL-6	Reduce or eliminate adverse effects to TE	1-3	Based on mitigations and design features (Sect. 6 of BA)	Nesting eagles will be protected from disturbance and potential nest/roost trees will not be cut**.**
O-WL-7	Minimize building or upgrading roads in TE areas	1-3	Disturbance Indicator 7. Also see lynx indicator 12	The action alternatives will result in a net reduction in open road miles due to the decommissioning of unclassified roads and the closing of OML1 roads. Temporary roads will be obliterated.
O-WL-16	Promote the conservation and recovery of bald eagle	1-3	Based on all analysis indicators and mitigations	Habitat will be maintained or improved with all alternatives and nesting eagles protected from disturbance which will help to promote recovery
S-WL-3	Management will be governed by NSBERP	1-3	Based on mitigations and design features (Sect. 6 of BA)	Design features and mitigations incorporated from Guidelines for Bald Eagle Breeding Areas within the NSBERP bring Alternatives 1-3 into compliance.

CUMULATVE EFFECTS

ESA – Cumulative effects as a result of future timber harvest on non-federal ownership are expected to be minimal. Planned State harvests are located more than ½ mile from occupied habitat or suitable foraging lakes. Little to no harvest activity is predicted on County or Potlatch/Northwest Paper Lands. Private lands occur along the shoreline of foraging lakes but land use is largely residential so habitat is likely to be maintained and disturbance levels are expected to be minimal. Negligible cumulative effects are expected to known bald eagle nests.

NEPA – Cumulative effects as a result of future timber harvest on non-federal ownership are expected to be minimal. Planned State harvests are located more than ½ mile from occupied habitat or suitable foraging lakes. Little to no harvest activity is predicted on County or Potlatch/Northwest Paper Lands. Private lands occur along the shoreline of foraging lakes but land use is largely residential so habitat is likely to be maintained and disturbance levels are expected to be minimal. Negligible cumulative effects are expected to known bald eagle nests. The effects of future federal projects on bald eagles are expected to be minimal. Federal timber harvest sold but not cut includes 81 acres of pine thinning which would not result in the removal of overstory nesting trees. There are no other reasonably foreseeable vegetation management actions within the project area at this time. The Tomahawk Trail Victor Lake By-Pass could result in a change in snowmobile use but no change in disturbance level during the eagle breeding season. The special use permit request for U7MN101 is more than ½ mile from occupied habitat. The direct and indirect effects of these federal projects will be analyzed in separate analyses and bald eagle will be considered in planning for these projects.

D. Determination of Effects – Bald Eagle

Alternative	Determination	Summary of Rationale
1	**NLAA**	Alternative 1 would result in more treatment acres and more temporary roads than the other alternatives but would also create more future habitat than the other two alternatives. In Alternative 1 there is a partial harvest (269.20) proposed near the Delay Lake stick nest and a clearcut harvest (254.41) proposed near the eagle nest on Dumbell Lake. There are two additional clearcut units (255.7 and 269.13) within ¼ mile of the Delay stick nest. A new temporary road for Alternative 1 could extend within ¼ mile from the Delay Lake stick nest. No adverse effects are expected to these territories based on site specific mitigations (Sect. 6) and compliance with the NLS Bald Eagle Recovery Plan including a 660' buffer zone around each nest. There is a small increase in the miles of OML 1 and 2 under this alternative but this is a result of open unclassified roads being added to the system. Overall, there would be a decrease in open road miles under Alternative 1 (Lynx indicators 7-14). In general, available habitat for eagles will increase under this alternative. Alternative One would result in 1,147 acres of white pine planted within ¼ mile of lakes gt 20 acres. In addition, the red and white pine forest type would increase from the existing 35% of the upland forest to 40% in the year 2015. Old/old-growth red/white pine would increase to 9.4% of upland forest and young red/white pine would increase to 4.5% under this alternative by the year 2015. Cumulative effects are expected to be minimal

Alternative	Determination	Summary of Rationale
2 No Action	NLAA	Alternative 2 is the no-action Alternative which results in no proposed treatments or changes in the transportation system. There would be no planned disturbance within close proximity to the three known nests in the project area. However, there would also be no habitat improvements (pine planting) with this alternative. As with the other alternatives, young pine would continue to naturally regenerate in some areas but brush competition would prevent regeneration in some stands. No temporary roads would result from this Alternative. No existing unclassified roads would be added to the system, decommissioned and/or closed so open road miles would remain higher under this Alternative than under Alternatives 1 or 3 (see lynx indicators 7-14). In general, available habitat for eagles would be maintained under this alternative. The red and white pine forest type would continue to make up 35% of the upland forest. Old/old-growth red/white pine would increase to 9.7% of upland forest under this alternative by the year 2015 as compared to 4.2% in 2006. Cumulative effects are expected to be minimal
3	NLAA	Alternative 3 would result in fewer treatment acres and fewer temporary roads (4.2 vs. 6.4) than Alternative 1 but more than Alternative 2 (no-action). Future habitat (young pine) would increase under this alternative but there would be fewer acres of habitat improvement than with Alternative 1. In Alternative 3 there is a partial harvest (269.20) proposed near the Delay Lake stick nest but no harvest proposed near the eagle nest on Dumbell Lake or within ¼ mile of any nest. A new temporary road for Alternative 3 could extend within ¼ mile from the Delay Lake stick nest. No adverse effects are expected to the Delay Lake territory based on site specific mitigations (Sect. 6) and compliance with the NLS Bald Eagle Recovery Plan including a 660’ buffer zone around the nest. There is a small increase in the miles of OML 1 and 2 under this alternative but this is a result of open unclassified roads being added to the system. Overall, there would be a decrease in open road miles under Alternative 3 (Lynx indicators 7-14). In general, available habitat for eagles will increase under this alternative. Alternative 3 would result in 520 acres of white pine planted within ¼ mile of lakes > 20 acres. In addition, the red and white pine forest type would increase from the existing 35% of the upland forest to 38% in the year 2015. Old/old-growth red/white pine would increase to 9.7% of upland forest and young red/white pine would increase to 2.1% under this alternative by the year 2015. Cumulative effects are expected to be minimal.

Activity Specific Determination for Alternative 1 (MPA)

Management Activity	Determination	Consistent with Programmatic BA determination?
Timber Harvest	NLAA	Y
Reforestation	NLAA	Y
Non-harvest restoration	NLAA	Y
Road Management	NLAA	Y
Fuel Reduction	NLAA	Y

5.2 GRAY WOLF:

A. Analysis Area:

- **Direct/Indirect Effects Analysis Area:**
  - *Habitat indicators*: Analysis area for all indicators is federal lands within the project area.
  - *Human Disturbance indicators:* Analysis area for all indicators is federal roads within the project area.

- **Cumulative Effects Analysis Area and Actions Considered:**
  - **ESA -** Analysis for ESA cumulative effects considers past, on-going and reasonably foreseeable future (10 years) State, County and private activities within the project area. Past actions are taken into account in the existing conditions (See Inga South EA Appendix F). Reasonably ongoing and foreseeable future actions include 32 acres of timber harvest on State land, very little or no harvesting on Lake County or Potlatch/Northwest Paper lands and an unknown amount of harvesting on other private lands (See Inga South Appendix F).

  - **NEPA -**Analysis for NEPA cumulative effects considers past, on-going and reasonably foreseeable future (10 years) State, County, private and federal activities within the project area. Past federal actions are taken into account in the existing condition. On-going federal timber sales that have been sold but not harvested include 81 acres of pine thinning (from Red Pine and White Spruce Thinning and East Side Thinning EAs). There are no other reasonably foreseeable Forest Service vegetation management actions in the project area at this time. The Tomahawk Trail Victor Lake By-pass Environmental Assessment is currently being developed. The range of alternatives includes a maximum of 1.16 acres of clearing for a new snowmobile trail location (3,168 feet length multiplied by 16 feet width) and 0.6 miles of additional trail grooming (1.6 miles new minus 1.0 mile old). The Lake County Wildfire Protection Plan addresses long-term fuels and fire-related management needs within the Wildland Urban Interface but does not include site-specific management actions. All reasonably foreseeable fuels and fire-related management needs are included in the Inga South EA. We anticipate issuing

a special use permit for access on an existing road (U7MN101) to two private land parcels. The interdependent indirect effect of issuing this permit could include future timber harvest on these land parcels (Total of 240 acres of black spruce, pine and coniferous/deciduous . mix). See listing under ESA above for other known future State, County and private activities considered in this analysis.

Rationale for analysis areas and time frames: The analysis area boundaries are appropriate because they are large enough to overlap the territories of three packs and are an appropriate size to address the impacts to these packs. The cumulative effects analysis area is the project area. The programmatic BA has done a complete job of considering cumulative effects to wolf habitat across a broad landscape, to which effects are similar at the project scale. It is not necessary to go out to the Wolf Zone scale because this project does not change the road density of OML 3-5 roads. The appropriate scale for cumulative effects is the project scale because the concern for negative impacts comes primarily from human disturbance which is best measured at the site-specific scale. Human access effects of this project will not go beyond the project area scale. Per ESA Section 7 Consultation Handbook, cumulative effects are to be considered in the action area (for purpose of this analysis action area = project area). Present and foreseeable future (10 yrs) actions are considered. This is an appropriate timeframe because it includes all known future projects and provides a reasonably reliable estimate of what is expected to happen.

B. Effects Analysis for Gray Wolf:

The following indicators were chosen to analyze the direct and indirect effects of the action and the cumulative effects of other actions in the project area.

Indicators

Forest Plan BA Indicator	Use?	Rationale for exclusion
1. Acres and percent of young upland forest <10 years old (MIH 1 young)	Y	
2. Acres and percent of upland conifer (spruce and pine) > 9 years old on all uplands (MIH 5)	Y	
3. Proposed miles of RMV trails	N	There are currently 24 miles of trail designated open to snowmobile in the project area. There are no trails designated as open to ATVs in the project area. This project does not propose any changes to the trail system.
4. Cross-country use policy for RMVs	N	This project proposes no change on the RMV (off highway recreation motor vehicles) cross-country use policy.
5. Miles of temp and OML 1 roads	Y	
Other Indicators		**Rationale for inclusion**
6. Miles of roads open for RMV use (federal OML 1 and 2, unclassified)	Y	The amount of roads open to RMV use varies by alternative and will have varying effects. To help assess O-WL-5

Habitat and Disturbance Indicators for Gray Wolf

Gray Wolf Indicators	Existing Condition		Acres and Percent of Habitat in 2015					
			Alt 1 Modified Proposed Action		Alt 2 No Action		Alt 3	
	acre	%	acre	%	acres	%	acres	%
1. Acres and percent of young upland forest <10 years old (MIH 1 young)	404	2	2,655	13	0	0	1,531	7
2. Acres and percent of upland conifer (spruce and pine) > 9 years old on all uplands (MIH5)	9.843	47	10,443	50	11,304	54	10,858	52
	Miles		Miles		Miles		Miles	
5. Miles of temporary and OML 1 roads	22.1 (0.0, 22.1)		30.0 (6.4, 23.6)		22.1 (0.0, 22.1)		27.8 (4.2, 23.6)	
Other Indicators	Miles		Miles		Miles		Miles	
6. Miles of road where RMVs are allowed	97.8		90.8		97.8		90.9	

Data source: Existing condition for vegetation indicators are based on 2005 CDS data, and all alternatives are based on projected CDS data in the year 2015. Roads indicator data for Existing Condition and alternatives are based on GIS and INFRA database data.
Other Footnotes: Percentages are based on the percent of total upland forest on federal lands in the project area (21,007 acres) for the dry-mesic-red-and-white-pine landscape ecosystem. For indicator 5, numbers in parentheses are the miles of each road type that make up the total for that indicator. *Note*: There are currently 10.1 miles of Forest Service jurisdiction unclassified roads in the project area. With the no action alternative all would remain open. With all action alternatives the unclassified roads would become decommissioned, converted to OML 1 or 2 roads, or used as temporary roads and then decommissioned resulting in 0.0 miles. Miles of road where RMVs (off highway recreation motor vehicles) are allowed (Indicator 6) includes existing OML 1and 2 NFSR's and unclassified roads that have not been decommissioned or legally closed. All temporary roads needed to access harvest units will be obliterated and allowed to return to a more natural state once reforestation objectives have been met (see Inga South EA Chap. 2 Description of Treatments).

C. Consistency with Forest Plan for Gray Wolf:

Forest Plan Guidance	Direction	Alts In Compliance	Basis for Compliance	Remarks
O-WL-4	Maintain or improve habitat	1-3	All analysis indicators	In the action alternatives, habitat for prey increases and open roads decrease. Sufficient habitat for prey will be maintained with the no action alternative (Alt 2) when cumulative effects and natural disturbance are considered.
O-WL-5	Seek opportunities to benefit TE spp.	1 and 3	Indicators 5 and 6 Also lynx indicator 12	Open road density and road miles where RMVs are allowed is reduced in all action alternatives. All temporary roads needed to access harvest units will be obliterated and allowed to return to a more natural state once reforestation objectives have been met. Alternative 2 (no action) will maintain the same transportation system and wolves would not see the benefit of decommissioning/closing open roads (unclassified and system). OML roads 3-5 do not vary by alternative.
O-WL-6	Reduce or eliminate adverse effects to TE	1 and 3	Indicators 5 and 6 Also lynx indicator 12	See O-WL-5 discussion.
O-WL-7	Minimize building or upgrading roads in TE areas	1-3	Indicators 5 and 6 Also lynx indicator 12	Alt 1: 6.4 miles of temporary road which will be obliterated, 0 miles of newly constructed system road and 6.2 miles decommissioned Alt 2: No change in transportation system. Alt 3: 4.2 miles of temporary road which will be obliterated, 0 miles of newly constructed system road and 6.1 miles decommissioned
O-WL-17	Promote the conservation and recovery of gray wolf	1-3	All analysis indicators; mitigations/design features	All alternatives provide adequate levels of suitable habitat. The action alternatives would reduce the miles or road open to RMVs.
S-WL-3	Management will be governed by Eastern Timber Wolf Recovery Plan (ETWRP)	1-3	All analysis indicators	This project follows the Forest Plan Biological Assessment and the Biological Opinion for the Superior and Chippewa National Forest Revised Land and Resource Management Plan.
G-WL-10	Provide for the protection of known active den sites	1-3	See design features for TES (Sect. 6 of this document)	If an active den is discovered, it will be reported to the District biologist and mitigations applied.

CUMULATVE EFFECTS

ESA –Cumulative effects as a result of future timber harvest on non-federal ownership are expected to be minimal. Harvesting on State and Private lands will contribute to foraging habitat for prey species. Low standard road density could increase slightly; however, public scoping resulted in only one special use request which is being analyzed in the Inga South EA. The Forest Plan predicted increased human access as a result of an increase in low standard roads and trails. Despite this increase the Biological Opinion states that "it is unlikely that mortality would increase significantly from current rates, and as such, it is not anticipated to hinder wolf recovery and population stability on the National Forests or in northern Minnesota" (USDI 2004). The Biological Opinion also states that prey availability is not likely to threaten wolves in the Eastern Distinct Population Segment (USDI 2004).

NEPA – Cumulative effects as a result of future timber harvest on all ownerships are expected to be minimal. Timber harvesting will continue to provide foraging habitat for prey species and mature conifer will continue to be available as thermal cover. The Forest Plan predicted increased human access as a result of an increase in low standard roads and trails. Despite this increase the Biological Opinion states that "it is unlikely that mortality would increase significantly from current rates, and as such, it is not anticipated to hinder wolf recovery and population stability on the National Forests or in northern Minnesota" (USDI 2004). The Biological Opinion also states that prey availability is not likely to threaten wolves in the Eastern Distinct Population Segment (USDI 2004).

The Tomahawk Trail Victor Lake By-Pass could result in a change in snowmobile use in the project area (potential net increase of 0.6 miles of trail). The direct and indirect effects of this federal project will be addressed in a separate analysis and wolf will be considered in planning for that project. The special use permit request for U7MN101 could result in higher levels of use on that road and more potential for human/wolf encounters. However, as a result of Alternative One of the Inga South proposal, roads open to RMVs would be reduced by 7 miles (Indicator 6). The cumulative effects of roads and trails on wolves are expected to be minimal.

D. Determination of Effects – Gray Wolf

Alternative	Determination	Summary of Rationale
1	**NLAA**	Alternative 1 would create more young upland habitat (13%) in 2015 for wolf prey (deer, moose) than the other two alternatives but fewer acres of thermal cover for prey. There would be an increase in OML1 roads with this alternative (Indicator 5) but this is a result of adding open unclassified roads to the system and should not result in any change in disturbance levels. Under Alternatives 1 or 3, the miles of road open to RMVs would decrease by 7 miles in the project area as a result of

Alternative	Determination	Summary of Rationale
		decommissioning and legal closures (wolf indicator 6, lynx indicator 12) which is expected to reduce disturbance levels for wolves. Cumulative effects are expected to be minimal. Implementation of this project is not likely to adversely affect the gray wolf or gray wolf critical habitat.
2 – No Action	NLAA	This alternative would continue to provide adequate prey habitat. Foraging habitat for prey in the project area is not increased by harvesting on federal lands but will continue to occur as a result of natural disturbance events and harvesting on nonfederal lands. This alternative provides the highest amount of thermal cover for prey (upland conifer > 9 years). Moose and deer populations are not expected to be limiting factors for wolves under the Revised Forest Plans (Biological Opinion, pg. 16). Alternative 2 (no action) will maintain the same transportation system and wolves would not gain the benefit of decommissioning/closing open roads (unclassified and system). Cumulative effects are expected to be minimal
3	NLAA	Alternative 3 would create more young upland habitat (7%) in 2015 for wolf prey (deer, moose) than Alternative 2 but fewer acres than Alternative 1. There would be an increase in OML1 roads with this alternative (Indicator 5) but this is a result of adding open unclassified roads to the system and should not result in any change in disturbance levels. Under Alternatives 1 or 3, the miles of road open to RMVs would decrease by approximately 7 miles in the project area as a result of decommissioning and legal closures (wolf indicator 6, lynx indicator 12) which is expected to reduce disturbance levels for wolves. Cumulative effects are expected to be minimal.

Activity Specific Determination for Alternative 1 (MPA)

Management Activity	Determination	Consistent with Programmatic BA determination?
Timber Harvest	NLAA	Y
Reforestation	NLAA	Y
Non-harvest restoration	NLAA	Y
Road Management	NLAA	N* (Programmatic BA - LAA)
Fuel Reduction	NLAA	Y

* This alternative will reduce the miles of open roads from existing condition which is expected to be an improvement. Although road miles remain high the effect of this alternative is a reduction.

5.3 CANADA LYNX:

A. Analysis Area:

- **Direct/Indirect Effects Analysis Area:** *Habitat indicators*: Analysis area is federal lands within LAUs SNF 19 and 20. The project area is used to disclose habitat improvements (Indicator 10).
  Human Disturbance indicators: Analysis area is federal roads within LAUs SNF 19 and 20.

- **Cumulative Effects Analysis Area (for both NEPA and ESA):**
  Cumulative effects consider all ownerships and roads within LAUs SNF 19 and 20. Past nonfederal actions are taken into account in the existing condition. Some of the ongoing and reasonably foreseeable future nonfederal actions in the project area would take place in LAU 20 (95% of LAU 20 is within the project area). Future nonfederal activities for the project area include 32 acres of timber harvest on State land, very little or no harvesting on Lake County or Potlatch/Northwest Paper lands and an unknown amount of harvesting on other private lands (See Appendix F). The amount of unsuitable habitat on all ownerships was considered (Indicator 11). Other nonfederal activities predicted in LAU 19 include 3-4 special use permits and one trout lake access and effects are disclosed in the Dunka BA (S.Catton, pers. comm., USDA 2005a). Highway One reconstruction does not occur within LAU 19 or LAU 20.

  Past federal actions are taken into account in the existing condition. On-going federal timber sales that have been sold but not harvested in the project area include 81 acres of pine thinning (from Red Pine and White Spruce Thinning and East Side Thinning EAs). There are no other reasonably foreseeable Forest Service vegetation management actions at this time. The Tomahawk Trail Victor Lake By-pass Environmental Assessment is currently being developed within LAU 19. The range of alternatives includes a maximum of 1.16 acres of clearing for a new snowmobile trail location (3,168 feet length multiplied by 16 feet width) and 0.6 miles of additional trail grooming (1.6 miles new minus 1.0 mile old). Additional future federal projects for LAU 19 include activities proposed in the Dunka EA (USDA 2005a and b) and the Tomahawk EA. Activities resulting from the Crescent Lake decision are accounted for in the existing condition. We anticipate issuing a special use permit for access on an existing road (U7MN101) to two private land parcels within LAU 20. The interdependent indirect effect of issuing this permit could include future timber harvest on these land parcels (Total of 240 acres of black spruce, pine and coniferous/deciduous mix). The Lake County Wildfire Protection Plan addresses long-term fuels and fire-related management needs within the Wildland Urban Interface but does not include site-specific management actions. All reasonably foreseeable fuels and fire-related management needs are included in the Inga South EA.

  Rationale: See Superior National Forest Plan Appendix E: Canada Lynx Section 5. Scales of Analysis, pg E-3 for rationale for spatial analysis

boundary. The temporal analysis boundary of 10 years is an appropriate timeframe because it includes all known future projects and provides a reasonably reliable estimate of what is expected to happen.

Table 1 provides a list of all Lynx analysis units (LAUs) that overlap the Inga-South project area. The predominant LAUs in the project area are SNF 19 and 20 and appear in **bold face** in the table below. Those that are not in bold will not be analyzed because this project will not affect lynx habitat within these LAUs or the effects are extremely small.

Acres and Percent of each Lynx Analysis Units (LAU) within the Inga-South Project Area.

LAU	Gross Acres	Acres of LAU in Project Area [1]	% of LAU in Project area
SNF11	57,221	26	0.0 %
SNF18	23,553	42	0.2 %
SNF19	**24,965**	**13,510**	**54.1 %**
SNF20	**25,873**	**24,669**	**95.3 %**
SNF21	73,265	1196	1.6 %
SNF23	27,627	2184	7.9 %
SNF25	42,331	278	0.7 %
SNF26	22,603	70	0.3 %

[1] *Data source: ArcView analysis; April 2005 LAU summary data*
Other Footnotes: There are no project activities within LAUs 11, 18 or 26. Project effects to LAUs 21, 23 and 25 are minor and documented in the project record.

B. Effects Analysis for Canada Lynx:

The following indicators were chosen to analyze the direct and indirect effects of the action and the cumulative effects of other actions in the project area.

Forest Plan BA Indicator	Use?	Rationale for exclusion
1a. Acres of snowshoe hare habitat on NFS lands	Y	
1b. Percent of unsuitable habitat on NFS land	Y	
2. Acres of red squirrel habitat on NFS lands	Y	
3. Denning habitat in patches > 5 acres on federal lands	Y	
4. Percent of lynx habitat in LAUs with adequate canopy cover- (upland forest > 4 years old and lowland forest > 9 years old)	N	Unsuitable hare habitat in the LAUs is less than 3%. Foraging and denning indicators show adequate amounts of forested cover. Forest connectivity was evaluated for the existing condition (see Status of Species – occupied and unoccupied habitat) and by alternative and determined to be adequate.
5. Miles of ATV trails allowed	N	There are no trails designated as open to ATVs in the project area. This project does not propose any addition to the ATV trail system.
6. Miles of snowmobile trails allowed	N	There are currently 24 miles of trails designated open to snowmobile in the project area. These will remain open and do not vary by alternative.
7. Miles of temp, unclassified and OML 1& 2 roads	Y	
8. Policy on cross-country use of ATVs and snowmobiles	N	This project proposes no change to the cross-country use of ATV and snowmobile policy.
9. Policy on use of ATVs and snowmobiles on OML 1& 2 roads	N	This project proposes no change to the policy on ATVs and snowmobile use of OML 1 and 2 roads.
Other Indicators		**Rationale for inclusion**
10. Acres where planting of young conifer is expected to increase within stand structure (project area).	Y	To compare beneficial site-specific features of each alternative of increasing small diameter conifers and stand structure as a component of prey habitat. To help assess O-WL-5
11. Acres and % of lynx habitat currently unsuitable on all ownerships	Y	Provides a measure of G-WL-3
12. Miles of roads to be decommissioned and unclassified roads converted to OML 1 and closed on NFS lands	Y	To help measure O-WL-14
13. Miles of road where RMVs (off highway recreation motor vehicles) are allowed on NFS lands (OML 1&2, unclassified).	Y	To help measure O-WL-13
14. Road and compacted trail density on all ownership.	Y	Used to measure G-WL-8

Lynx Habitat – Forest Condition Indicators

Indicators		Existing Condition [1]		Acres and Percent of habitat in 2015 [3]					
				Alternative 1 (modified proposed action)		Alternative 2 (no action)		Alternative 3	
		Acres	% [2]	Acres	% [2]	Acres	% [2]	Acres	% [2]
1a. Snowshoe hare habitat									
Lynx Analysis Units	SNF 19	11,902	55	10,893	50	11,971	55	11,193	51
	SNF 20	10,851	61	9,051	50	10,260	57	9,073	50
1b. Young Habitat Unsuitable for Snowshoe Hare									
Lynx Analysis Units	SNF 19	157	0.7	486	2.2	407	1.9	460	2.1
	SNF 20	179	1.0	118	0.7	0	0	118	0.7
2. Red Squirrel Habitat									
Lynx Analysis Units	SNF 19	10,688	50	10,657	49	10,791	49	10,791	49
3. Denning Habitat in patches > 5 acres									
Lynx Analysis Units	SNF 19	8,866	42	8,125	39	9,911	47	8,706	42
	SNF 20	6,778	40	5,604	33	7,722	46	5,940	35

Data Source: [1] Existing Condition based on April 2005 frozen CDS data

Other Footnotes: [2] percent of lynx habitat on NFS lands (In 2006 SNF 19 = 21,482 ac, SNF 20 = 17,882 ac. In 2015 SNF 19 = 21,803 ac, SNF20 = 18,027).
Denning percent is based on forested lynx habitat on NFS lands (SNF 19 = 20,888 ac, SNF 20 = 16,902 ac)

[3] Includes proposed actions and cumulative actions (Dunka, Tomahawk, Crescent Lake in LAU19) to date on federal lands within each LAU.
This figure represents the worst case and assumes that all present and proposed actions will be in the 0-4 age class at the same time.

Lynx Habitat – Other Indicators

Indicator 10. Project Area acres where planting of young conifer is proposed and will increase within stand structure.		
Alternative 1	**Alternative 2 – No Action**	**Alternative 3**
1,025	0	658
Data Source: [1] Acreages based on 2005 frozen CDS data *Other Footnotes:* This analysis considered planting following mechanical site prep (MSP) and partial harvest treatments with higher residual basal area remaining (PC60 and PCCC). Additional young conifer is expected following even-aged treatments such as clearcutting and as a result of natural regeneration but is not included in the above totals.		

Lynx Analysis Units	Total Lynx Habitat on all ownerships (acres)	Currently Unsuitable on all ownerships	
		acres	%
Indicator 11: Currently Unsuitable Lynx Habitat on all ownerships			
SNF 19	23,586	1788	7.6
SNF 20	24,983	1602	6.4
Data Source: [1] Acreages based on April 2005 frozen CDS data *Other Footnotes:* This analysis assumes that all other ownership in SNF 19 is lynx habitat in an unsuitable condition (1,631 acres). Photo interpretation was used to more accurately estimate the suitability of other ownership for LAU20 and is estimated to be 1,423 acres. Processes and results are documented in the project record.			

Lynx Habitat – Human disturbance/Access Indicators

Indicators		Existing Condition [1]	Miles of road in 2016 [3]		
			Alternative 1 (modified proposed action)	Alternative 2 (no action)	Alternative 3
		miles	miles	miles	miles
7. Miles of Temporary, Unclassified Road, OML 1, and OML 2 roads (Combined)					
Lynx Analysis Units	SNF 19	4.2, 7.2, 15.7, 40.1 (67.2)	6.8, 0.5, 17.1, 40.5 (64.4)	4.2, 7.2, 15.7, 40.1 (67.2)	5.2, 0.5, 17.1, 40.6 (64.5)
	SNF 20	0.0, 3.5, 8.5, 26.1 (38.1)	3.7, 0.0, 8.6, 27.7 (40.0)	0.0, 3.5, 8.5, 26.1 (38.1)	3.1, 0.0, 8.6, 27.7 (40.0)
	total	4.2, 10.7, 24.2, 36.2 (105.3)	10.5, 0.5, 25.7, 68.2 (104.4)	4.2, 10.7, 24.2, 36.2 (105.3)	10.5, 0.5, 25.7, 68.2 (104.4)
12. Miles of existing road to be decommissioned and existing unclassified road converted to OML 1 – closed (Combined)					
Lynx Analysis Units	SNF 19	1.9, 0.0 (1.9)	6.8, 1.5 (8.3)	1.9, 0.0 (1.9)	6.6, 1.5 (8.1)
	SNF 20	0	1.1, 0.1 (1.2)	0	1.1, 0.1 (1.2)
	total	1.9, 0.0 (1.9)	7.9, 1.6, (9.5)	1.9, 0.0 (1.9)	7.7, 1.6 (9.3)
13. Miles of road where RMVs are allowed					
Lynx Analysis Units	SNF 19	55.2	48.9	55.2	49.7
	SNF 20	38.3	37.2	38.3	37.0
14. Road and snow-compacted Trail Density – mi/mi2					
Lynx Analysis Units	SNF 19	3.03	2.85	3.03	2.86
	SNF 20	2.36	2.33	2.36	2.33

Data Source: [1] Existing Condition and alternatives based on updated roads shapefile for roads within the Inga South project area (fall 2005) and October, 2005 Infra database for roads in portions of LAUs outside of the project area. Existing conditions for SNF 19 include net changes made in Dunka Decision Notice added to the existing condition derived from this Infra and GIS data. Existing condition for all indicators were recalculated and do not equal data for Dunka EA primarily due to correction of data errors within Inga South project area after calculations made for Dunka Project. Trail and compacted snow routes data from FP analysis was used.
Other Footnotes: Miles of road where RMVs (off highway recreation motor vehicles) are allowed includes existing OML 1and 2 NFSR's and unclassified roads that have not been decommissioned or posted as closed. In action alternatives unclassified roads are either converted to NFSR (OML 1 or 2) or decommissioned. This figure does not represent the amount of cross-country use by snowmobiles. Road and trail density based on linear mile per square land mile and is a cumulative measure that includes non-federal roads.

C. Consistency with Forest Plan– Canada Lynx

Forest Plan Guidance	Direction	Alts In Compliance	Basis for Compliance	Remarks
O-WL-4	Maintain or improve habitat	1-3	All analysis indicators	Key vegetative habitat components are maintained in all alternatives. Stand structure and diversity would be improved with Alternatives 1 and 3 (see below).
O-WL-5	Seek opportunities to benefit TE spp.	1 and 3	Indicator 10	The two action alternatives contain varying levels of conifer planting within partial harvest units (high residual ba) and mechanical site prep units. These treatments will retain a high percentage of the existing canopy and the young conifers will improve stand diversity and vegetative structure. Short-term decreases in hare habitat may occur due to the removal of brush but improvements to foraging habitat are expected within 5 years of treatment as brush returns along with young conifer.
O-WL-6	Reduce or eliminate adverse effects to TE	1 and 3	Project design and mitigation measures. Indicator 14	The action alternatives provide for key habitat components and move towards reducing road densities. Design features protect denning lynx. Alternative 2 (no action) would not reduce existing road/trail densities (LAU19 = 3.03, LAU20=2.36)
O-WL-7	Minimize building or upgrading roads in TE areas	1-3	Project design and Indicator 7	No new system roads or upgrading of roads are proposed for this project. All temporary roads needed to access harvest units will be obliterated and allowed to return to a more natural state once reforestation objectives have been met. Unclassified and system roads will be decommissioned in both action alternatives.
O-WL-8	Promote the conservation and recovery of Canada lynx	1-3	All analysis indicators	Habitat for species is maintained in all alternatives

Forest Plan Guidance	Direction	Alts In Compliance	Basis for Compliance	Remarks
O-WL-9	Manage for hare and alt prey habitat	1-3	Indicators 1a, 1b, 2 and 10	Hare habitat would remain above 50% and squirrel habitat would remain above 40% in all alternatives by the year 2015. Alternative 1 and 3 could improve prey habitat conditions by improving stand structure and diversity (see O-WL-5)
O-WL-10	Provide foraging habitat in proximity to denning habitat	1-3	Arcview analysis is in project record	All denning habitat in patches greater than 5 acres are within 3 miles of adequate foraging habitat. See G-WL-10 below.
O-WL-11	Maintain habitat connectivity to reduce road mortality	n/a	n/a	This project was not designed to address the objective. However, vegetative connectivity for movement across LAUs is maintained with all alternatives (see O-WL-10).
O-WL-12	Participate in efforts to identify, map, and maintain linkage areas	n/a	n/a	This effort is being conducted on a regional scale
O-WL-13	Maintain (or improve) competitive advantage of lynx in deep snow	1-3	Indicator 14	In all action alternatives fewer roads will be available for RMVs than are currently available. This should help to maintain the competitive advantage of lynx in deep snow. Alternative 2 maintains the existing competitive advantage
O-WL-14	Participate in efforts to reduce lynx mortality on roads	1 and 3	Indicators 14	This project is not specifically designed to reduce lynx mortality on roads. The two action alternatives vary in amounts of roads that will be decommissioned or legally closed to limit motorized access. This effort may result in less potential for negative human/lynx interactions.
O-WL-15	In BWCAW, lynx habitat will result from natural processes	n/a	n/a	This project does not occur in the BWCAW and will have no effect on lynx refugia habitat.
G-WL-1	Moderate timing and intensity of mgt activities to maintain lynx habitat	1-3	Project design	All alternatives and proposed actions are within the ecological constraints relevant to lynx habitat

Forest Plan Guidance	Direction	Alts In Compliance	Basis for Compliance	Remarks
G-WL-2	Provide protection of known den sites	1-3	Design features for TES (Sect. 6)	Known den sites will be protected. The closest proposed treatment to a known historical den location is approximately 0.9 miles. No negative effects are expected as a result of treatments within the home range of L14 (female with den in 2004 and 2005). Approximately 40 acres of treatments are proposed on the very northern edge of this home range amounting to 1.2% of the entire home range (3,450 acres for 95% kernel home range). The treatments proposed may increase prey habitat within her home range within five years of harvesting. Private harvesting (240 acres) could occur as a result of issuing a special use permit which could lead to short-term reductions in foraging and denning habitat in L14's home range. Neither FS nor private harvesting would be within the core area of L14's home range.
G-WL-3	No more than 30% of an LAU in unsuitable condition on all ownerships	1-3	Indicators 11	Both LAU 19 (7.6%) and LAU 20 (6.4%) are well below the 30% guideline.
S-WL-1	No more than 15% change to unsuitable in 10 years on NFS lands	1-3	Indicator 1b	The change in unsuitable habitat in LAUs 19 and 20 is not expected to exceed 15% in the next decade under any alternative. Percent unsuitable in LAU 19 is expected to be 3.5% by the year 2013 (Dunka BA 2005) and will change only minimally by adding the unsuitable acres predicted for 2016 (Indicator 1b at 1.9%-2.2%). There are no foreseeable future federal projects in LAU20 that would increase the amount of unsuitable above what is displayed in Indicator 1b (0-0.7%).

Forest Plan Guidance	Direction	Alts In Compliance	Basis for Compliance	Remarks
G-WL-4	Maintain at least 10% denning habitat	1-3	Indicator 3	All alternatives maintain a minimum of 33% denning habitat in all LAUs
G-WL-5	Following disturbance, retain at least 10% denning habitat	n/a	n/a	This project is not proposing to salvage after a natural disturbance
S-WL-2	No net increase in groomed or designated over-the-snow trails	n/a	n/a	This project does not propose to create any new snow-compacting trails.
G-WL-6	New over-the-snow routes should be designed to benefit lynx	n/a	n/a	This project does not propose to create any new snow-compacting trails.
G-WL-7	Close trails and roads that intersect with new snow-compacting trails.	n/a	n/a	This project does not propose to create any new snow-compacting trails.
G-WL-8	Maintain road density below 2mi/mi^2	1-3	Indicator 14 Existing condition is above 2mi/mi^2	Alternative 2 (no action) would not reduce existing road/trail densities (LAU19 = 3.03, LAU20=2.36). Neither Alternative 1 nor 3 would bring the road/trail density below 2 mi/mi^2 but density would be reduced from existing condition.
G-WL-9	Do not upgrade or pave dirt or gravel roads	n/a	n/a	This project does not propose to upgrade or pave dirt roads

CUMULATVE EFFECTS (NEPA and ESA)

Cumulative effects could occur as a result of future federal actions or actions that occur on lands outside of Forest Service jurisdiction. The cumulative effects to the forest conditions of lynx habitat (Indicator 11) from vegetation management activities and the effects of human disturbance/access as a result of road and trail management (Indicator 14) are measured.

Adverse cumulative effects are not expected from cumulative vegetation management activities in LAUs SNF 19 or 20. More than 90% of each of these LAUs is currently providing suitable lynx habitat on all ownerships (Indicator 11). Adequate amounts of foraging and denning habitat would remain on federal lands in 2015 which should offset any short-term loss in habitat on nonfederal lands. We expect timber harvesting to create additional prey foraging habitat within five years of disturbance. Historic den sites (L14) would not be disturbed by known federal or nonfederal activities (see consistency for G-WL-2). Denning and foraging habitat would continue to be adequately distributed throughout both LAUs.

As stated in the Programmatic BA, the greatest potential for cumulative negative impacts and pressure on lynx recovery is likely to be the result of human access. Road densities in SNF 19

and 20 remain above 2 miles per sq. mile in all action alternatives (Indicator 14). Private land development and road building will continue as will increased recreational demand in these LAUs. These activities could reduce the lynx competitive advantage and increase the risk of mortality. However, as a result of Alternative One of the Inga South proposal, roads open to RMVs and road/trail density would be reduced (Indicator 13 and 14).

The Tomahawk Trail Victor Lake By-Pass could result in a change in snowmobile use in the project area (potential net increase of 0.6 miles of trail). The direct and indirect effects of this federal project will be addressed in a separate analysis and lynx will be considered in planning for that project. The special use permit request for U7MN101 could result in higher levels of use on that road and changes in habitat within the home range of L14. Private harvesting (maximum of 240 acres) could occur as a result of issuing a special use permit which could lead to short-term reductions in existing foraging and denning habitat in L14's home range but could also create prey foraging habitat. Neither FS nor private timber harvesting would be within the core area of L14's home range.

D. Determination of Effects – Canada Lynx

Alternative	Determination	Summary of Rationale
1	**NLAA**	Forest conditions would continue to provide for lynx denning, foraging and movement across the analysis area. All alternatives are similar in availability of foraging habitat for hare and squirrel Percent of hare habitat acres (Indicator 1a) is slightly lower with this alternative (50% in both LAUs) in 2015 than with the other two alternatives. Percent of denning habitat (Indicator 3) would also be slightly lower with this alternative (LAU 19 = 39%, LAU 20 = 33%) as compared to other alternatives but proximity of denning and foraging habitat would be maintained. Road and compacted trail densities are currently above 2 mi per sq. mi in both LAUs minimizing the lynx's competitive advantage and maintaining a risk of mortality due to roads. Road/trail densities would be reduced slightly with Alternative 1 due to the decommissioning of roads (Indicator 12 and 14) resulting in a density for LAU 19 of 2.85 and a density for LAU 20 of 2.33. Cumulative effects are expected to be minimal.
2	NLAA – no action	Forest conditions would continue to provide for lynx denning, foraging and movement across the analysis area. All alternatives are similar in availability of foraging habitat for hare and squirrel Percent of hare habitat acres (Indicator 1a) is slightly higher with this alternative (LAU 19 = 55%, LAU 20 = 57%) in 2015 than with the other two alternatives. Percent of denning habitat (Indicator 3) would also be highest with this alternative (LAU 19 = 47%, LAU 20 = 46%) as compared to other alternatives. Road and compacted trail densities are currently above 2 mi per sq. mi in both LAUs minimizing the lynx's competitive advantage and maintaining a risk of mortality due to roads (LAU19 = 3.03 LAU

Alternative	Determination	Summary of Rationale
		20=2.36). Alternative 2 (no action) would maintain the same transportation system and lynx would not gain the benefit of decommissioning/closing open roads (unclassified and system). Cumulative effects are expected to be minimal
3	NLAA	Forest conditions would continue to provide for lynx denning, foraging and movement across the analysis area. All alternatives are similar in availability of foraging habitat for hare and squirrel Percent of hare habitat acres (Indicator 1a) is similar to Alternative 1 but less than Alternative 2 for the year 2015. Percent of denning habitat (Indicator 3) would also be slightly lower (LAU 19 = 42%, LAU 20 = 35%) with this alternative as compared to Alternative 2 but higher than Alternative 1. Proximity of denning and foraging habitat would be maintained. Road and compacted trail densities are currently above 2 mi per sq. mi in both LAUs minimizing the lynx's competitive advantage and maintaining a high risk of mortality due to roads. Road/trail densities would be reduced slightly with Alternative 3 due to the decommissioning of roads (Indicator 12 and 14) resulting in a density for LAU 19 of 2.86 and a density for LAU 20 of 2.33 which is similar to Alternative 1. Cumulative effects are expected to be minimal.

Activity Specific Determination for Alternative 1 (MPA)

Management Activity	Determination	Consistent with Programmatic BA determination?
Timber Harvest	NLAA	Y
Reforestation	NLAA	Y
Non-harvest restoration	NLAA	Y
Road Management	NLAA	N* (Programmatic BA - LAA)
Fuel Reduction	NLAA	Y

* This alternative will reduce the miles of open roads from existing condition which is expected to be an improvement. Although road miles remain high the effect of this alternative is a reduction.

6.0 Site-specific Design Features and Mitigations

Design features common to all Final Harvest and Fuel Treatments, Tofte Ranger District, Superior National Forest, in all alternatives.	
Resource	**Design Feature**
Threatened, Endangered, and Sensitive Species	Where adverse impacts to known TES species can be minimized or avoided, a site-specific design criteria/mitigation measure would be identified. Examples of unit specific design criteria/mitigations include measures such as seasonal restrictions or protective buffers. Where identified, follow unit specific design criteria and mitigations to protect TES, MIS or other species of interest that are known to occur in or adjacent to a treatment unit and are likely to be affected by management activities. Retain any tree with a large stick nest and buffer it with a two chain radius (132') until the District biologist can be consulted and a determination is made. Look for opportunities to incorporate nests into reserve tree clumps or legacy patches. If management activities threaten any known, active wolf or lynx dens, these activities would be delayed until after the wolves or lynx have finished using the den site. If any threatened, endangered, sensitive or other plant and animal species of interest or their nests, dens or roost trees are found during planning layout or operations, activities would be temporarily halted in the area. The District Biologist would be consulted and appropriate mitigation measures would be carried out prior to restarting operations. The Forest Plan, recovery plans and conservation strategies will be used when making mitigation recommendations. Pre-burn treatments would occur around supercanopy red and white pine (potential eagle nest trees) where fuel loading is high. Treatments would involve removal of fuel concentrations from the base of trees and/or wetting of remaining fuels around the trees prior to burning. Burn plans will include specific smoke management measures designed to prevent the incident of unacceptably high concentrations of smoke and pollutants at known or newly discovered active nest sites OR conduct activities between August 15th and February 15th which is outside of the eagle's nesting period.
Vegetation for Wildlife and Within-Stand Diversity	In stands 20 acres or larger that were regenerated with clearcuts, retain a minimum of 5% of the stand in legacy patches of live trees where no harvest occurs. Legacy patches should be at least two acres in size wherever possible and no less than ¼ acre. When locating patches consider including important features such as wetland inclusions, seasonal ponds, riparian areas, forested corridors, den trees, cavity trees, trees with stick nests, large mature white pine, rare plant locations and rare native plant communities. In general, retain a minimum of 6-12 live leave trees per acre to provide present and future benefits including shelter, resting sites, cavities, perches, rest sites, foraging sites, mast, and coarse woody debris. The trees will be at least six inches in diameter for hardwoods and 5 inches in diameter for conifers, and include at least two trees per acre from the largest size classes available on site. A variety of species would be selected for within-stand species and structural diversity. In clear-cut harvest units reserve trees are retained in addition to legacy patches. In general. all standing, live, healthy cedar, white pine, and tamarack are

Design features common to all Final Harvest and Fuel Treatments, Tofte Ranger District, Superior National Forest, in all alternatives.	
Resource	**Design Feature**
	designated as leave trees and are not to be cut except for trees needed to be removed because of safety hazard concerns or where specified on the unit card. These trees would count towards the 6-12 leave trees except where jack pine or black spruce are required for the Three-Toed Woodpecker (O-WL-23). Unmerchantable trees, dead standing trees and trees not designated for harvest will be left. The operator will be allowed to fell (and leave in place) a portion of these trees in areas where deemed necessary to facilitate the logging operations, as well as for safety reasons. Dead trees do not count towards the 6-12 live trees/acre reserved in clearcuts. If seasonal ponds are identified during layout they will generally be protected with a minimum 50-foot buffer. Seasonal ponds have an identifiable edge caused by annual flooding and may be identified during dry periods by the lack of forest litter in the depression.

Site Specific Mitigation Measures for Wildlife and Plants for All Alternatives			
Unit(s)	**Resource**	**Feature of concern**	**Mitigation**
254041 269020	Wildlife	Eagle/osprey nest within unit	Buffer the nest tree with a 660' no harvest/disturbance zone. If the nest is active, restrict activities associated with roads and harvesting during the bald eagle nesting season (Feb. 15 - Oct. 1). Follow the NLS Bald Eagle Recovery Plan. Within the stand, retain supercanopy red and white pine for nest trees. Protect existing regenerating pine as much as possible.
255007 269013	Wildlife	Within 1/4 mile of eagle/osprey nest	Retain supercanopy red and white pine for nest trees. Protect existing regenerating pine as much as possible. If the nest is active, restrict activities associated with roads during the bald eagle nesting season (Feb. 15 - Oct. 1).
228013, 228095 229010, 231006 231018, 231019 254044, 228044, 231007 228094, 229005 224006	Wildlife	Eagle/osprey nesting potential	Maintain mature red and white pine. Protect existing regenerating pine as much as possible
235053, 236002, 228062, 236067, 228028, 235054 236015, 228055, 254067 259020, 228042, 229006, 231008, 229013	Wildlife	Eagle/osprey nesting potential	Retain some supercanopy red and white pine for nest trees. Protect existing regenerating pine as much as possible.
222028, 228070, 229011 237028, 224001, 237019 237021, 312002, 255020 229013, 312007, 312008	Wildlife	Within a large mature pine patch	Manage to maintain the characteristics of mature or older native upland forest vegetation and promote the maintenance or

Site Specific Mitigation Measures for Wildlife and Plants for All Alternatives			
Unit(s)	**Resource**	**Feature of concern**	**Mitigation**
224006, 228020, 228058 228060, 228061, 237027 235053, 236002, 228062			development of interior forest habitat conditions
229021, 229022, 228042 228013, 312008, 228020 228058, 228060, 228061 228062, 265010, 285007 285032, 287006, 228028	Wildlife	Deer browsing may affect success of plantings.	Monitor success of plantings. Protect seedlings from browsing if necessary.
236041 236070	Wildlife	Contains habitat for Sensitive butterfly	Only allow operations from August 15-June 15th. For 236.41 - Retain at least 12 mature trees per acre to favor dwarf bilberry.
262016 262019 256056	Wildlife	Stand diversity	Protect existing red and white pine regeneration wherever possible. In 256.56 – protect regenerating cedar as much as possible.
231014	Wildlife	Stand diversity	Retain mature white pine, red pine and cedar. Leave small islands of spruce-fir.
266037	Wildlife	Stand diversity	Maintain mature red and white pine and yellow birch.
267022	Wildlife	Stand diversity	Leave yellow birch and cedar.
267058	Wildlife	Stand diversity	Maintain mature red and white pine. Protect existing regenerating pine as much as possible.
231016	Wildlife	Stand diversity	Maintain mature red and white pine. Protect existing regenerating pine as much as possible. Leave scattered reserved aspen to reduce competition from suckering.
229022 229021	Wildlife	Stand diversity/deer	Include some spruce as leave trees for diversity and thermal cover.
235049 235052	Wildlife	Stand diversity	Leave mature white pine and cedar. Protect existing regeneration as much as possible.
236017	Wildlife	Stand diversity	Leave mature red and white pine and protect regenerating pine wherever possible.
235049	Wildlife	Stand diversity	Leave mature white pine and cedar. Protect existing regeneration as much as possible.
235052 236017	Wildlife	Stand diversity	Leave mature white pine and cedar. Protect existing regeneration as much as possible.
312015 312016	Wildlife	Stand diversity	Maintain at least 12-15 mature white pine per acre.
259060	Wildlife	Nesting potential for boreal owl	Leave scattered reserved aspen to reduce competition from suckering and to retain some large aspen capable of producing cavities.

Site Specific Mitigation Measures for Wildlife and Plants for All Alternatives			
Unit(s)	**Resource**	**Feature of concern**	**Mitigation**
			Locate reserve areas along southern boundary in proximity to lowland stands.
259058		Nesting potential for boreal owl. Retain stand diversity.	Maintain mature red and white pine. Protect existing regenerating pine as much as possible. Leave scattered reserved aspen to reduce competition from suckering and to maintain nest trees. Locate reserve areas along western edge of stand in proximity to lowland stand.
259002 265017	Wildlife	Nesting potential for boreal owl	Reduce treatment acres. Retain northern portion of stand as mature for nesting habitat. Leave areas and leave trees should consolidate along wetland/lowland boundaries to maintain potential nesting trees. If present, retain some large aspen capable of producing cavities.
265010, 262019, 259020 256040, 256041, 257050 259060, 262015, 262028 262034, 262036, 262055 262063, 262075, 263066 264019, 286019, 286032	Wildlife	Nesting potential for boreal owl	Leave areas and leave trees should consolidate along wetland/lowland boundaries to maintain potential nesting trees. If present, retain some large aspen capable of producing cavities.
266035	Wildlife	Nesting potential for boreal owl	Retain some large aspen capable of producing cavities. Leave a 150 meter buffer along western edge of stand to maintain nesting habitat.
259001	Wildlife	Nesting potential for boreal owl	Retain southeastern portion of stand as mature for nesting habitat. Leave 10-15 trees/acre. Favor spruce and pine as leave trees but leave some mature aspen to reduce suckering and provide cavity trees for boreal owl. Leave areas should consolidate along wetland/lowland boundaries.
230014 231026	Wildlife Riparian	Riparian Habitat values	Locate reserve trees and reserve areas on creek side of unit.
258019	Wildlife	Adjacent recently managed stands creating a large young opening (<20 years)	Leave 12-15 trees/acre plus legacy patches
258021 258027	Wildlife	Adjacent recently managed stands creating a large young opening (<20 years). Nesting potential for boreal owl.	Leave 12-15 trees/acre plus legacy patches. Leave areas and leave trees should consolidate along wetland/lowland boundaries to maintain potential nesting trees. If present, retain some large aspen capable of producing cavities.

Site Specific Mitigation Measures for Wildlife and Plants for All Alternatives			
Unit(s)	**Resource**	**Feature of concern**	**Mitigation**
231008 229005	Wildlife	Three-toed woodpecker	Retain 6-10 jack pine per acre where possible.
256043	Wildlife	Rare plant	Avoid decking or landing logs at the site of this rare plant occurrence.
224006, 222028, 229013 228070, 228058, 235053 237021	Noxious Weeds	Tansy	Noxious weeds within or adjacent to unit. See design features for invasive plants.
259020	Noxious Weeds	Tansy and bull thistle	Noxious weeds within or adjacent to unit. See design features for invasive plants.
259060	Noxious Weeds	Tansy and Canada thistle	Noxious weeds within or adjacent to unit. See design features for invasive plants.
236070	Noxious Weeds	Spotted Knapweed	Noxious weeds within or adjacent to unit. See design features for invasive plants.
228044	Plants	Sensitive wetland plant population.	Protect shoreline from disturbance.
255020	Plants	Sensitive wetland communities	Retain young pine on edge of wetlands.
236067	Plants	Sensitive wetland communities	Protect wetland edge.

7.0 Monitoring

The Forest Plan identifies three monitoring elements related to threatened and endangered species (Chapter 4, Table MON-4):

- To what extent is Forest management contributing to the conservation of threatened and endangered species and moving toward short term (10-20 years) and long-term (100 years) objectives for their habitat conditions and population trends?

- To what extent are road and trail closures effective in prohibiting unauthorized motor vehicle use?

- To what extent is the Forest maintaining no net increase in groomed or designated over-the-snow trail routes unless the designation effectively consolidates use and improves lynx habitat through a net reduction of compacted snow areas?

Conducted by: ___/s/ Peg Robertsen_____ Date: ___01/24/2006_
Peg Robertsen, Wildlife Biologist

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