FOREST-WIDE TRAVEL MANAGEMENT PROJECT

Superior National Forest

Biological Evaluation

Region 9 Regional Forester Sensitive Species

Wildlife and Aquatic Evaluation and Assessment:

Prepared by: /s/ Dan Ryan Date: 12/12/2008
Dan Ryan, Wildlife Biologist

Botanical Evaluation and Assessment:

Prepared by: /s/ Jack Greenlee Date: 12/12/2008
Jack Greenlee, Forest Plant Ecologist

TABLE OF CONTENTS

EXECUTIVE SUMMARY **3**

FEDERALLY LISTED SPECIES 3
SENSITIVE SPECIES 3
Wildlife *3*
Vascular plants, lichens, and byrophytes *3*

BIOLOGICAL EVALUATION **3**

INTRODUCTION: 3
PROJECT ALTERNATIVES CONSIDERED AND ANALYZED IN DETAIL 5
SURVEYS CONDUCTED 12
SITE-SPECIFIC MITIGATION 12
MONITORING 12
DESCRIPTION OF AFFECTED SPECIES: 12
BALD EAGLE 13
GRAY WOLF 15
NORTHERN GOSHAWK 17
LARGE AND MATURE UPLAND FOREST PATCH GUILD 20
AQUATIC SPECIES GUILD 21
SENSITIVE SPECIES: VASCULAR PLANTS, LICHENS, AND BRYOPHYTES 23
Analysis area and methods *23*
ENVIRONMENTAL CONSEQUENCES *24*
Habitat Group 1: RFSS plants of shallow water and non-forested wetlands and riparian areas 25
Habitat Group 2: RFSS plants of cliffs and talus slopes 27
Habitat Group 3: RFSS plants of upland disturbed areas 28
Habitat Group 4: RFSS plants of forested wetlands 30
Habitat Group 5: RFSS plants of northern hardwood forests 33
Habitat group 6: RFSS plants of dry to mesic upland forests 34

REFERENCES **36**

EXECUTIVE SUMMARY

FEDERALLY LISTED SPECIES
See the Forest-wide Travel Management Biological Assessment (BA) for results on the Canada lynx.

SENSITIVE SPECIES
WILDLIFE
Alternative 1, 2, 3 and 4 would have no direct, indirect, or cumulative effects to Le Conte's sparrow, olive-sided flycatcher, yellow rail, peregrine falcon, sharp-tailed grouse, tiger beetle, Mancinus alpine butterfly, red-disked alpine butterfly, Nabokov's blue butterfly, jutta artic butterfly, Freija's grizzled skipper butterfly and Quebec emerald dragon fly.

For Alternatives 1, 2, 3 and 4 the proposed activities may impact individuals of heather vole, gray wolf, northern goshawk, boreal owl, black-throated blue warbler, bay-breasted warbler, Connecticut warbler, three-toed woodpecker, great gray owl, wood turtle, lake sturgeon, shortjaw cisco, northern brook lamprey, creek heelsplitter, black sandshell but are not likely to cause a trend to federal listing or loss of viability.

VASCULAR PLANTS, LICHENS, AND BYROPHYTES

Alternatives 1, 2, 3, and 4 would have no direct, indirect, or cumulative effects to long-leaved arnica, maidenhair spleenwort, Appalachian fir club moss, sticky locoweed, nodding saxifrage, encrusted saxifrage, false asphodel, smooth woodsia, *Arctoparmelia centrifuga*, and *Arctoparmelia subcentrifuga*.

The proposed activities in Alternatives 1, 2, 3, and 4 may impact individuals of alpine milkvetch, swamp beggar-ticks, floating marsh-marigold, Katahdin sedge, linear-leaved sundew, neat spike rush, moor rush, auricled twayblade, fall dropseed muhly, American shoregrass, dwarf water lily, club-spur orchid, northern bur-reed, awlwort, lance-leaved violet, *Cladonia wainoi*, large-leaved sandwort, Ross' sedge, pointed moonwort, common moonwort, Michigan moonwort, pale moonwort, ternate grapefern, least moonwort, Douglas hawthorn, small shinleaf, cloudberry, fairy slipper, ram's head ladyslipper, Western Jacob's ladder, *Caloplaca parvula, Certraria aurescens, Frullania selwyniana, Menegazzia terebrata, Ramalina thrausta, Sticta fuliginosa, Usnea longissima, Pseudocyphellaria crocata*, moschatel, triangle grapefern, goblin fern, New England sedge, Chilean sweet cicely, Braun's holly fern, Canada yew, barren strawberry, Canada ricegrass, rough-fruited fairy bells, and *Peltigera venosa*, but are not likely to cause a trend to federal listing or loss of viability.

BIOLOGICAL EVALUATION

INTRODUCTION:
This Biological Evaluation (BE) evaluates the effects of the Forest-wide Travel Management project on threatened, endangered, proposed, and Regional Forester-listed (R9) sensitive species (U.S. Department of Agriculture (USDA) Forest Service Manual sections 2670.3, 2670.5 (3),

2672.4). The species evaluated in this report include all species on the newly revised R9 sensitive species list (November 8, 2006).

The management objective is to maintain viable and well-distributed representation of all native species that occur on the Superior National Forest (National Forest Management Act Regulation 219.19 and 219.26, Secretary of Agriculture Regulation 9500-4, USDA Forest Service Manual 2670.12, 2670.22, and 2670.32, Forest Plan p. 3-4). I used the following working definitions for viability and well-distributed from Iverson and René (1997):

viability--the likelihood that habitat conditions will support persistent and well-distributed populations over time;

well-distributed--species and habitat distribution are based on the current and historic natural distribution and dispersal capabilities of individual species, and dispersal includes the concepts of metapopulation dynamics and gene flow.

The purpose of the Forest-wide Travel Management Project (See Environmental Assessment for more detail) is to determine which roads and trails on the Superior National Forest are to be available for public motorized use, including highway vehicle use (licensed cars and trucks), All Terrain Vehicle (ATV) use, Off-Highway Motorcycle Use, and use by unlicensed Off Road-Vehicles (Class 2 ATVs and non-highway legal 4 wheel drive vehicles).

The area covered by the analysis of direct and indirect effects includes all national forest system lands within the proclamation boundaries of the Superior National Forest and also includes the Kabetogema and Pigeon River Purchase units. Not included in this project is the Boundary Waters Canoe Area Wilderness where motorized use is restricted by legislation. Although no decisions will be made for lands within the BWCAW, the effects to the wilderness will be considered as part of this analysis. The project area is located in Cook, Lake and St. Louis Counties, and encompasses approximately 2,768,000 acres of which approximately 1,363,900 are national forest system lands. Other landowners who manage land within the Project Area boundaries include the State of Minnesota, Cook County, Lake County, St. Louis County, and private landowners. All management actions proposed as part of the Forest-wide Travel Management Project would occur on National Forest System land, although they may be closely linked with decisions made by others on their lands. The analysis boundary includes that area to which direct and indirect effects would occur.

The area covered by the cumulative effects analysis includes lands of all ownerships within the Forest boundary because the Forest's large size contains enough habitats of the sensitive species to evaluate the effects of the project. The time scale used for the analysis of direct, indirect and cumulative effects is 15 year which includes actions in the past 10 years and reasonably foreseeable actions in the next five years. This time scale is chosen because it is reasonable to assume that all proposed projects would be implemented by this time and expected effects have occurred. This is also an appropriate time scale for cumulative effects because it allows for the most realistic prediction of reasonably foreseeable future projects.

PROJECT ALTERNATIVES CONSIDERED AND ANALYZED IN DETAIL

The alternatives include the following actions (See Chapter 2 of the EA):

Table 1. Forest-wide Travel management proposed actions by alternative.

Task	**Existing**	**MPA**	**MORE**	**LESS**
Alternative	**1**	**2**	**3**	**4**
OML-1 Roads available for ATV/OHM use	383.65	422.73	424.91	422.15
OML-1 Roads on the Forest	939.9	1008.36	1006.18	989.61
OML-2 Roads available for OHV use (Includes ATV)	855.13	902.93	912.12	871.72
OML-2 Roads on the Forest	935.77	991.9	994.97	987.93
OML-3 Roads available for OHV (Includes ATV) use	3.44	86.22	117.62	41.49
OML-3 Roads on the Forest	232.13	232.51	232.51	232.51
OML-4 Roads available for OHV (includes ATV) use	0	75.68	148.81	70.31
OML-4 Roads on the Forest	319.62	319.62	319.62	319.62
OML-5 Roads available for OHV (Includes ATV) use	0	9.86	13.34	9.86
OML-5 Roads on the Forest	81.09	81.09	81.09	81.09
Trails available for ATV/OHM use	48.05	105.27	164.58	59.31
Unclassified Roads on the Forest	327.73	24.38	25.65	25
Unclassified Roads available for OHV use	280.2			
Unclassified Roads closed to OHV use	47.53			
Available for ATV/OHM Totals	1530.47	1602.69	1781.38	1474.84
Available for all OHVs Totals	1098.77	1074.69	1191.89	993.38

Table 2A and 2B display all Region 9 Regional Foresters Sensitive Species (RFSS) known or expected to occur on the Superior National Forest. There are currently 87 Regional Forester Sensitive Species on the Superior National Forest. The sensitive species list for the Superior National Forest is revised periodically as new information becomes available. 54 species were analyzed in detail because there is a chance of the proposal affecting habitat for these species, and the species are at a moderate to high risk of being impacted by project activities. The remaining 33 species were deemed to be at low risk, because no activities are proposed in their preferred habitat. These habitats include cedar swamps, expansive grasslands, sedge wetlands, wet meadows, shallow marshes, shallow pools, small ponds, open bogs, calcareous lakeshores, and near very large lakes.

Table 2A: Sensitive Species evaluated, and impacts by alternative.

TES Species			
Scientific name **Common name**	**No Impact**	**May Impact**	**Habitat Summary**
SENSITIVE SPECIES: TERRESTRIAL WILDLIFE			
Heather vole *Phenacomys intermedius*		1,2,3,4	Forest, brushland or clearcuts with *Vaccinium* spp. and rocks.
Northern goshawk *Accipiter gentilis*		1,2,3,4	Large patch of older trees with closed canopy and open understory.
Boreal owl *Aegolius funereus*		1,2,3,4	Secondary cavity nester. Old boreal forest (inc. aspen) next to lowland conifer foraging areas.
Le Conte's sparrow *Ammodramus leconteii*	1,2,3,4		Uplands and lowlands with dense, tall, grass/sedge vegetation and thick ground litter.
Olive-sided flycatcher *Contopus cooperi*	1,2,3,4		Snags, low density conifer lowlands, riverine/riparian areas.
Yellow rail *Conturnicops noveboracensis*	1,2,3,4		Lowland sedge meadows with specific characteristics such as overhead mat of dead sedge.
Black-throated blue warbler *Dendroica caerulescens*		1,2,3,4	Large contiguous mature forests, probably associated with small canopy gaps and a well-developed shrub understory
Bay-breasted warbler *Dendroica castanea*		1,2,3,4	Mature upland and lowland spruce/fir forests.
Peregrine falcon *Falco peregrinus anatum*	1,2,3,4		Nest: cliff/ledges; Hunt: forest openings, lakes, wetlands
Connecticut warbler *Oporornis agilis*		1,2,3,4	Jack pine or lowland conifer with a thick ericaceous understory.
Three-toed woodpecker *Picoides tridactylus*		1,2,3,4	Coniferous forests with snags
Great gray owl		1,2,3,4	Nesting habitat of mature trees on wet soil

TES Species			
Scientific name **Common name**	**No Impact**	**May Impact**	**Habitat Summary**
Strix nebulosa			with >60% canopy closure near open foraging areas.
Sharp-tailed grouse *Tympanuchus phasianellus*	1,2,3,4		Brushland complexes (>5,000 acres) with open areas, brush and small trees, as well as large open agricultural hay or pasture with associated brush habitat.
Wood turtle *Clemmys insculpta*		1,2,3,4	Upland and lowland habitats with suitable shade and insects for forage. Riparian habitats with open sandy areas for nesting.
SENSITIVE SPECIES: AQUATIC WILDIFE			
Lake sturgeon *Acipenser fulvescens*		1,2,3,4	On SNF: Large lakes and rivers in the Hudson Bay drainage.
Shortjaw cisco *Coregonus zenithicus*		1,2,3,4	Lake Superior, Saganaga and Gunflint Lakes, possibly others.
Northern brook lamprey *Ichthyomyzon fossor*		1,2,3,4	Warm, medium-sized, low-gradient streams with sections of higher gradient reaches suitable for spawning. Ammocoete's require organically enriched, sandy substrate until metamorphosis.
Creek heelsplitter *Lasmigona compressa*		1,2,3,4	Headwaters of larger rivers. St. Louis river and tributaries. Lake of the Woods tributaries.
Black sandshell *Ligumia recta*		1,2,3,4	Medium to large rivers.
SENSITIVE SPECIES: INSECTS			
Tiger beetle spp. *Cicindela denikei*	1,2,3,4		Sandy or rocky openings in northern hardwood forest communities.
Mancinus alpine *Erebia disa mancinus*	1,2,3,4		Shady black spruce swamp. Found in
Red-disked alpine *Erebia discoidalis discoidalis*	1,2,3,4		Black spruce areas
Nabokov's (or Northern) blue *Lycaeides idas nabokovi*	1,2,3,4		*Vaccinium cespitosum* host in open sandy jack pine areas.
Jutta arctic *Oeneis jutta ascerta*	1,2,3,4		Moderately forested black spruce bogs with sedges.
Freija's grizzled skipper *Pyrgus centaureae freija*	1,2,3,4		Upland acidic meadow.
Quebec Emerald dragonfly *Somatochlora brevicincta*	1,2,3,4		Predominantly bogs, fens, and heaths.

Table 2B. Sensitive Plant Known or Suspected Occurrence in the Travel Management Project Area

Scientific name **Common name**	**Potential Habitat Present in project area**	**Known Species Presence in project area < 200 feet from route proposed open to OHV, OHM, or ATV**	**Habitat Summary**
SENSITIVE SPECIES: Vascular Plants (Note: Unless cited otherwise, habitat descriptions are derived from information provided by the Minnesota Natural Heritage and Non-game Research Program [MNDNR 2007])			
Moschatel *Adoxa moschatellina*	Yes	No	Shaded damp cliffs and slopes in upland mature northern hardwood forest on North Shore
Long-leaved arnica *Arnica lonchophylla*	No	No	Cool & moist cliffs and ledges on North Shore. Arctic disjunct
Maidenhair spleenwort *Asplenium trichomanes*	No	No	In crevices of moist, mostly east-facing cliffs, ledges, and talus, Rove formation
Alpine milkvetch *Astragalus alpinus*	Yes	No	Sandy, gravelly fluctuating shorelines with sparse vegetation. Inland strand beach - sparse vegetation
Swamp beggar-ticks *Bidens discoidea*	Yes	No	Wet habitats: silty shores, hummocks in floating mats and swamps, partly submerged logs
Pointed moonwort *Botrychium acuminatum*	Yes	No	Open habitats such as old log landing, old dirt roads, borrow pits
Triangle grape-fern *Botrychium lanceolatum* var *angustisegmentum*	Yes	Yes	Northern hardwood forest, oldfields, old logging roads, trails
Common moonwort *Botrychium lunaria*	Yes	Yes	Open habitats such as old log landings, sawmill sites, old building sites
Michigan moonwort *Botrychium michiganense (hesperium)*	Yes	Yes	Open habitats such as old log landing, old dirt roads, gravel pits, powerline corridors, borrow pits. Also beach ridges, old fields, trails, and dredge spoil dumps (Walton 2000a)
Goblin fern *Botrychium mormo*	Yes	No	Mesic northern hardwood forest with thick leaf litter layer
Pale moonwort *Botrychium pallidum*	Yes	Yes	Open, disturbed habitats, log landings, roadsides, dunes, sandy gravel pits.
Ternate grape-fern *Botrychium rugulosum (=ternatum)*	Yes	Yes	Generally open habitats, such as old log landings and edges of trails.
Least moonwort *Botrychium simplex*	Yes	Yes	Generally open habitats, such as old log landings, roadside ditch, trails, open fields, base of cliff, railroad rights of way
Floating marsh-marigold *Caltha natans*	Yes	Yes	Perennial herb; shallow water of pools, ditches, sheltered lake margins, slow moving creeks, sloughs and oxbows, pools in shrub swamps
Fairy slipper *Calypso bulbosa*	Yes	Yes	Hummocks in northern white cedar swamps, moist to wet lowland conifer swamps, and to lesser extent in upland coniferous forests (Smith 1993)

Scientific name **Common name**	**Potential Habitat Present in project area**	**Known Species Presence in project area < 200 feet from route proposed open to OHV, OHM, or ATV**	**Habitat Summary**
Katahdin sedge *Carex katahdinensis*	Yes	No	In seasonally moist, gravelly/sandy soil; along shores of large and small lakes; margins of ephemeral pools; associated with seasonal flooding
New England sedge *Carex novae-angliae*	Yes	Yes	Moist woods with sugar maple, also with birch, aspen, tall shrubs; yellow birch and white spruce dominated forest
Ross' sedge *Carex rossii*	Yes	No	Rocky summits, dry exposed cliff faces, rocky slopes, in east Border Lakes subsection
Douglas's hawthorn *Crataegus douglasii*	Yes	Yes	North Shore rocky, gravelly streambeds/banks and open areas; and rocky borders of woods
Ram's-head lady's slipper *Cypripedium arietinum*	Yes	Yes	Wide variety of forests, both upland and lowland, but in MN predominantly in white cedar swamps; also in forests dominated by jack pine, red pine, or white pine
Rough-fruited fairy bells *Disporum trachycarpum*	Yes	No	Semi-open jack pine forest with aspen, birch, shallow rocky soils, in east Border Lakes subsection
Linear leaved sundew *Drosera linearis*	Yes	No	Minerotrophic water tracks in patterned peatlands
Neat spike-rush *Eleocharis nitida*	Yes	Yes	Mineral soil of wetlands, often w/ open canopy and disturbance, such as logging roads/ditches through wetlands
Appalachian fir club moss *Huperzia appalachiana*	No	No	Shelves and crevices on cliff/talus/rock outcrops, and shrub dominated talus piles
Moor rush *Juncus stygius*	Yes	No	Shallow pools in non-forested peatlands, often in a sedge-dominated community
Creeping rush *Juncus subtilis*	No	No	Sandy lakeshore – only known occurrence in BWCAW (Gerdes 2005a)
Auricled twayblade *Listera auriculata*	Yes	Yes	On alluvial or lake-deposited sands or gravels, with occasional seasonal flooding, associated with riparian alder or spruce/fir forest
American shore-grass *Littorella uniflora*	Yes	Yes	Shallow margins of nutrient-poor lakes, seepage lakes, sandy substrate, may have fine gravel/organic soil. Fluctuating water level up to about 1 meter.
Large-leaved sandwort *Moehringia macrophylla*	Yes	No	Cliffs/rock outcrops, talus, conifer sites on shallow soils, pine plantation with rocky outcrops; usually semi-open shrub or tree canopy
Fall dropseed muhly *Muhlenbergia uniflora*	Yes	Yes	Wet sandy beaches, floating peat mats
Dwarf water-lily	Yes	No	Slow moving streams, rivers, beaver

Scientific name **Common name**	**Potential Habitat Present in project area**	**Known Species Presence in project area < 200 feet from route proposed open to OHV, OHM, or ATV**	**Habitat Summary**
Nymphaea leibergii			impoundments 1-2 m deep. Occurs at outer margin of emergent vegetation.
Chilean sweet cicely *Osmorhiza berteroi*	Yes	No	Northern hardwood forest dominated by sugar maple on North Shore.
Sticky locoweed *Oxytropis borealis* var *viscida (=oxytropis viscida* var *viscida*	No	No	Slate cliffs and talus slopes in east Border Lakes subsection. Arctic/alpine disjunct
Canada Rice Grass *Piptatherum canadensis*	Yes	Yes	Sandy/gravelly soil; red pine/jack pine plantations, borders, edges, trailsides, openings (Gerdes 2005)
Club spur orchid *Platanthera clavellata*	Yes	Yes	Floating bog mats, sphagnum, stunted conifer swamp, mixed spruce tamarack, borrow pits, winter logging roads
Western Jacob's ladder *Polemonium occidentale ssp. lacustre*	Yes	No	Primarily white cedar swamps, also mixed conifer swamps; thrives in openings (Carlson and Sather 2001)
Braun's holly fern *Polystichum braunii*	Yes	No	Cool, shady cliffs and slopes in northern hardwoods in North Shore Highlands subsection
Lesser wintergreen or Small shinleaf *Pyrola minor*	Yes	No	Black spruce swamps, and ecotone between uplands and lowland alder/conifer swamp, prefers closed canopy.
Cloudberry *Rubus chamaemorus*	Yes	No	Black spruce/sphagnum forest, acidic. Superior NF at southern edge of species range
Nodding saxifrage *Saxifraga cernua*	No	No	Cliffs, ledges, diabase cliff (calcium based feldspars). Arctic/alpine disjunct. One location in MN on open cliff.
Encrusted saxifrage *Saxifraga paniculata*	No	No	Cliffs, sheltered crevices, and ledges of north-facing cliffs; Arctic/alpine disjunct
Northern bur-reed *Sparganium glomeratum*	Yes	Yes	Floating muck mats in emergent wetland habitat such as moats, pond margins, road ditches
Awlwort *Subularia aquatica*	Yes	No	Beach zone of sandy nutrient-poor lakes. Shallow lake margins. Submerged or emerged, or stranded. 15-45 cm deep water, but can occur deeper. Can flower while stranded, or under other conditions.
Canada yew *Taxus canadensis*	Yes	Yes	Wide variety of uplands and lowlands, including cedar/ash swamps, talus and cliffs, northern hardwoods, aspen/birch forest (USDA Forest Service 2006)
False-asphodel *Tofieldia pusilla*	No	No	Sedge mats at edges of shoreline rock pools along Lake Superior. Arctic disjunct.
Lance-leaved violet	Yes	No	Sandy to peaty lakeshores; borders of

Scientific name **Common name**	**Potential Habitat Present in project area**	**Known Species Presence in project area < 200 feet from route proposed open to OHV, OHM, or ATV**	**Habitat Summary**
Viola lanceolata			marshes and bogs, damp sand ditches (USDA Forest Service 2004g)
Barrenstrawberry *Waldsteinia fragarioides*	Yes	No	Upland coniferous and deciduous forests, in recently harvested areas, established plantations, and areas with no recent harvest
Smooth woodsia *Woodsia glabella*	No	No	Moist, north-facing cliffs along Lake Superior. Arctic disjunct.
A lichen sp. *Arctoparmelia centrifuga*	No	No	Lichen; Sunny rocks and open talus slopes (USDA Forest Service 2002a)
A lichen sp. *Arctoparmelia subcentrifuga*	No	No	Lichen; Sunny rocks and open talus slopes
a lichen sp. *Caloplaca parvula*	Yes	No	Smooth bark of young black ash in moist, humid old growth black ash stand (USDA Forest Service 2002c)
a lichen sp. *Cetraria aurescens*	Yes	No	Conifer bark in lowland conifer swamps (old cedar/black spruce - USDA Forest Service 2002d)
a lichen sp. *Cladonia wainoi (= pseudorangiformis)*	Yes	No	On rock outcrops and thin soil – exposed sites with lots of light (USDA Forest Service 2002e)
A liverwort sp. *Frullania selwyniana*	Yes	No	Lowland cedar swamps on bark of white cedar (Janssens 2002)
Port-hole lichen *Menegazzia terebrata*	Yes	Yes	Cedar swamps, especially old growth; base of cedar trees (USDA Forest Service 2002h)
a Dog lichen *Peltigera venosa*	Yes	No	Soil and moist cliffs, exposed root wads (USDA Forest Service 2002i)
a lichen sp. *Pseudocyphellaria crocata*	Yes	No	Mossy rocks, trees in partially shaded, moist, frequently foggy habitats (USDA Forest Service 2002j)
A lichen sp. *Ramalina thrausta*	Yes	Yes	Cedar swamps, especially old growth (USDA Forest Service 2002k)
a lichen sp. *Sticta fuliginosa*	Yes	No	On hardwoods in humid, old growth cedar or ash bogs (USDA Forest Service 2002l)
a lichen sp. *Usnea longissima*	Yes	Yes	On old conifers in moist situations, often in or near a conifer or hardwood swamp (USDA Forest Service 2002m)

SURVEYS CONDUCTED

Project surveys were not conducted for regional forester sensitive species. These species are assumed present in suitable habitat. This project would only produce a motor vehicle use map. No surveys were conducted because the action alternatives 2, 3, 4 would, in most cases, have less impact than the no action Alternative 1. Data from the Minnesota Natural Heritage Database (previous surveys conducted for other projects on the Forest and surveys conducted by other agencies) were consulted for certain species.

SITE-SPECIFIC MITIGATION

There are no mitigation measures established specifically for this project. All Forest Plan standards and guidelines and best management practices already in place will be adhered to during project implementation. However, there are mitigation measures specific to the project that would generally contribute to the conservation of regional forester sensitive species:

1. Annually update the motor vehicle use map, incorporating information from the public and changes in resource conditions.
2. Following the publishing of the motor vehicle use map, law enforcement will increase public awareness of off highway vehicle designations through field contacts with users, and if necessary, issuing citations.
3. Superior National Forest staff will promote public education of the motor vehicle use map through issuing news releases, updating the forest website, meetings with off highway vehicle clubs and other special interest groups, and the development of off highway vehicle education material.
4. Superior National Forest staff will work with other agencies including the Minnesota Department of Natural Resources, the 1854 Authority, townships, and St. Louis, Lake, and Cook counties to increase awareness of off highway vehicle designations, and to help reduce barriers for off highway vehicle riders using roads that cross multiple townships.

MONITORING

There is no project-specific monitoring included with any of the alternatives, except for required Forest Plan monitoring for effective road closures, management indicator species, and other wildlife resource issues. The gray wolf and northern goshawk are management indicator species, which are monitored over time to assess the effects of management activities on their population trends. The monitoring of management indicator species also helps to assess the effects on other species with similar habitat needs. The Superior National Forest, the Minnesota Department of Natural Resources, and the Natural Resources Research Institute regularly conduct monitoring of management indicator species.

DESCRIPTION OF AFFECTED SPECIES:

The analysis will look at gray wolf, bald eagle, northern goshawk, large and mature upland patch guild, aquatic species guild, and vascular plants, lichens and bryophytes. Gray wolf and bald eagle are analyzed separately because they only recently came off of the Threatened and Endangered Species list and both are susceptible to disturbance from humans. Northern goshawk is analyzed separately because it is also susceptible to human disturbance and has some distinct nesting territories. Other species are grouped into the mature upland patch guild (Black-

throated blue warbler, bay-breasted warbler, Connecticut warbler, three-toed woodpecker, boreal owl, great gray owl), aquatic species guild (wood turtle, lake sturgeon, short-jaw cisco, northern brook lamprey, creek heelsplitter, black sandshell), and vascular plants, lichens and bryophytes (broken into 6 habitat guilds).

BALD EAGLE

A. ANALYSIS AREA

- **Direct/Indirect Effects Analysis Area:**
  Human Disturbance indicators: The analysis area for direct and indirect effects caused by human disturbance is ¼ mile from known nests. Negative effects to bald eagles are caused primarily by human disturbance, which is more likely to occur when off vehicle access is allowed.

- **Cumulative Effects Analysis Area:**
  The analysis area for cumulative effects includes National Forest, State of Minnesota, County, Tribal, and private lands in the project area.
  Rationale: The direct/indirect effects analysis area is appropriate because most eagles nest within ½ mile of lakes greater than 20 acres and fish-bearing streams. Human disturbance is analyzed ¼ mile from known nests as specified by the Northern States Bald Eagle Recovery Plan (Grier, et. al, 1983). Cumulative effects are analyzed on all ownerships in the project area as specified by the Endangered Species Act Section 7 Consultation Handbook (USFWS, 1998).

Analysis Indicators: Miles of road open to vehicles within ¼ mile of existing bald eagle nests will be used to show possible disturbance to nesting eagles. Miles of vehicles use in nearbank riparian habitat is also used to demonstrate possible disturbance in new nesting territories and also as possible negative impacts to future nest trees and possible aquatic impacts to prey species (fish).

Effects of Proposed Activities

Direct effects

Table 3. Existing conditions of bald eagle habitat, and effects by alternative.

Other Indicators	Alt. 1 Existing		**Alt. 2**		Alt. 3		Alt. 4	
	nests	miles	**nests**	**miles**	nests	miles	nests	miles
Roads open to motor vehicles within ¼ mile of nests	20	8.9	**20**	**8.7**	20	8.9	19	7.6
% nests with vehicle use in ¼ mile	9.3%		**9.3%**		9.3%		8.8%	

	Alt. 1 Existing	**Alt. 2**	Alt. 3	Alt. 4
Miles of vehicle use in nearbank riparian zone	26.3	10.8	17.2	7.4

The primary effect that off highway vehicle use may have on bald eagle populations is the potential for disturbance of the breeding pair, especially during the critical nesting period.

- Some bald eagles can tolerate human activity, and may choose to build their nests near roads that need to be kept open for public use.
- Nesting bald eagles may be disturbed briefly by the sound of passing off highway vehicles; however, most off highway vehicles would not be visible from the nest due to the dense forest canopy cover.
- Alternatives 2 and 4 would reduce roads (Table 3) open to vehicles within bald eagle breeding areas.

Indirect effects

- All action alternatives would reduce road miles in the nearbank riparian zone which could improve aquatic habitat conditions, thereby, improving bald eagle prey species (fish) numbers. There also could potentially be less impacts to future bald eagle nesting habitat (red and white pine trees).
- Nests may blow down during storms, and bald eagles may move to different sites from year to year. Conservation of nesting habitat is even more important than the preservation of specific nest sites. Bald eagle nesting, foraging, and roosting habitat is usually within ½ mile of lakes greater than 20 acres and fish-bearing streams.
- Alternatives 2 and 4 would reduce human disturbance due to off highway vehicles, and improve bald eagle nesting, foraging, and roosting habitat. Alternative 4 is most desirable.

Cumulative effects

See Appendix x in the EA for a list of past, present, and reasonably foreseeable projects analyzed in this cumulative effects section

Spatial framework: The analysis of cumulative effects considers the impact of past, present, and future management activities to bald eagles on all land ownerships in the project area.

Time frame: Cumulative effects analysis considers a 15 year period, which includes the accomplishments of the past 10 years, and reasonably foreseeable activities within the next 5 years. The next 5 years is a realistic timeframe for estimating what projects may be proposed in the vicinity.

Past impacts: The project area is highly fragmented because of timber harvesting, mixed ownership patterns, development, and road construction. The quantity and standard of roads has remained relatively stable in the last 10 years. Road density has stabilized, but

the quality and standard of roads on the Superior has increased because of timber harvest and recreational activities. Increased human access may result in disturbance during the breeding season to bald eagles. Minnesota off highway vehicle registrations has increased dramatically, from 9,204 registrations in 1994 to 222,594 registrations in 2004.

Present impacts: Since 2004, many miles of road have been identified for decommissioning. Although only a portion of these miles of road decommissioning has actually been implemented on the ground due to limited budgets. Most of these objective maintenance level 1 roads have brushed in naturally. Road decommissioning from previous resource management projects is making real progress at reducing the road density, and consolidating road usage on the Superior National Forest. White pine restoration has been ongoing on USFS, State and County lands which should provide for future nest trees for bald eagles.

Future impacts: Off highway vehicle use is expected to increase over the next 5 years, due to ever increasing public demand for outdoor leisure activities. As more land that is private is posted with no trespassing signs, more pressure is place upon Federal, State, County, and other jurisdictions to designate trail routes for off highway vehicles. Although the bald eagle may benefit from the action alternatives on Federal Lands, the off highway vehicle project may shift the demand for access to State and County lands within the Superior National Forest. Forest Plan objective O-RMV-2 would allow up to 90 miles of designated off highway vehicle trails, some from this project and some from future projects that would be considered in future NEPA analysis. Lakeshore development should continue on private lands. Public lands should remain undeveloped and provide the majority of nesting sites for bald eagles.

Conclusion and Determination

Alternatives 1, 2, 3, and 4 **may impact** individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. Alternative 4 best supports bald eagle conservation, followed by Alternative 2, Alternative 1, and Alternative 3.

GRAY WOLF

The quantity and standard of roads in the project area has increased over the past twenty years because of timber harvest and recreational activities. Increased miles of roads has lowered the amount of remote habitat available to wolves, increased the risks of mortality from illegal shooting and trapping, collisions with vehicles, and introduced domestic canine parasites and diseases. However, wolves have adapted to areas with higher road and human densities than previously believed to be suitable for wolf survival (USFWS 2002).

Analysis Indicators: There would be no difference in high standard roads by alternative so this analysis looked at all roads open to motorized vehicles, not just high standard roads, by wolf zone. This indicator was used because any motorized use could lead to a higher potential for harassing or killing wolves.

Effects of Proposed Activities

Direct and Indirect Effects
The primary effect that off highway vehicle use may have on gray wolf populations within the Superior National Forest is the increased potential for harassment and illegal killing of individuals. High standard roads in the project area are below the 1 mile per square mile threshold (Zone 1 = 0.53 mi/mi^2, Zone 2 = 0.67 mi/mi^2, Zone 4 = 0.87 mi/mi^2) in the Recovery Plan for the Eastern Timber Wolf (USFWS, 1992).

Table 4. Total miles of roads open to motor vehicles by alternative and Wolf Management Zone.

Indicator of project effects*	Alt 1 (Existing)	Alt 2 (MPA)	Alt 3 (More)	Alt 4 (Less)
Miles of road open to all motor vehicles for gray wolf - Zone 1	2,013	1,936	2,038	1,663
Miles of road open to all motor vehicles for gray wolf - Zone 2	884	816	834	722
Miles of road open to all motor vehicles for gray wolf - Zone 4	1,744	1,694	1,717	1,566

* All indicators are miles of road open to all motor vehicles which including highway vehicles as well as OHVs.

The more roads that are left open to off highway vehicle use within the Superior National Forest, the more potential exists for harassing or illegally killing individual wolves. The current road system will remain in place and will continue to be open to some form of motorized use under this project. Of the alternatives evaluated, Alternative 4 would minimize the risk of harassment and illegal killing of wolves within the Superior National Forest, followed by Alternative 2, Alternative 3 and Alternative 1.

Cumulative Effects
See Appendix x in the EA for a list of past, present, and reasonably foreseeable projects analyzed in this cumulative effects section

Spatial framework: The analysis of cumulative effects considers the impact of past, present, and future management activities on regional forester sensitive species on all land ownerships in the project area. Opportunities for consolidating off highway vehicle use on ownerships other than National Forest were included in this proposed action. Consultation with the State, Counties and tribes occurred (see Chapter 1 in EA) to try and mesh our travel planning as much as possible. Other agencies do have different regulations about seasonal use of motorized vehicles but overall, between public landowners, road miles open to motor vehicles declines.

Time frame: Cumulative effects analysis considers a 15 year period, which includes the accomplishments of the past 10 years, and reasonably foreseeable activities within the next 5 years. The next 5 years is a realistic timeframe for estimating what projects may be proposed in the vicinity.

Past impacts: The project area is highly fragmented because of timber harvesting, mixed ownership patterns, development, and road construction. The quantity and standard of roads has

remained relatively stable in the last 10 years. Road density has stabilized, but the quality and standard of roads on the Superior has increased because of timber harvest and recreational activities. Increased road miles and road usage have lowered the amount of remote habitat available to the gray wolf. Increased human access may result in disturbance during the breeding season, illegal shooting and trapping, introduced parasites and diseases, and competition with other predators. Minnesota off highway vehicle registrations has increased dramatically, from 9,204 registrations in 1994 to 222,594 registrations in 2004.

Also, the DNR has made decisions on state forest lands in Cook and Lake Counties. Lake county has made 148.2 miles of travelways available for ORV riding and Cook County had made 314.9 miles of travelways available for ORV riding.

Present impacts: Since 2004, many miles of road have been identified for decommissioning. Although only a portion of these miles of road decommissioning has actually been implemented on the ground due to limited budgets. Road decommissioning from previous resource management projects is making progress at reducing the road density, and consolidating road usage on the Superior National Forest.

Future impacts: Off highway vehicle use is expected to increase over the next 5 years, due to ever increasing public demand for outdoor leisure activities. As more land that is private is posted with no trespassing signs, more pressure is place upon Federal, State, County, and other jurisdictions to designate trail routes for off highway vehicles. Although the gray wolf may benefit from the action alternatives on Federal Lands, the off highway vehicle project may shift the demand for access to State and County lands within the Superior National Forest. Forest Plan objective O-RMV-2 would allow up to 90 miles of designated off highway vehicle trails, some from this project and some from future projects that would be considered in future NEPA analysis.

Mitigation Measures
None.

Conclusion and Determination
Alternatives 1, 2, 3, and 4 **may impact** individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. Alternative 4 best supports gray wolf conservation, followed by Alternative 2, Alternative 3, and Alternative 1.

NORTHERN GOSHAWK

Existing Condition
Preferred habitat for the Northern goshawk consists of large tracts of mature, closed canopy, deciduous, coniferous, or mixed forest with an open understory in fairly contiguous blocks, intermixed with young forest and openings for additional production of important prey species. Large tracts of forest are important on the Superior, since the multitude of lakes and wetlands in the area naturally fragments the habitat and increases home range size. Suitable habitat is defined as forest conditions that currently fulfill primary nesting, post-fledging, or foraging

requirements. Mature forest provides compositional and structural features suitable for the development of a prey base that is available to the goshawk. Some habitat does not currently fulfill one of the goshawk's primary life requirements, but age and stand development would provide goshawk habitat in the future. These habitats may currently produce important prey species, but prey species in these situations are largely unavailable to the goshawk. This includes forest stands in the grass/forb, seedling/sapling, and pole stages of stand development. Unsuitable habitat conditions for goshawk include lakes, non-forested wetlands, bogs, lowland conifer, brush, and upland openings.

The amount and distribution of temporary fragmentation of mature forest habitat due to timber harvest is generally considered the greatest threat to the goshawk in the U.S. Forest management activities simplify compositional and structural diversity within stands and across the landscape (Peterson and Fichtel, 1992). Timber harvest patterns also reflect a tendency to clump activities. Projects may frequently involve silvicultural prescriptions in multiple stands of proximate compartments to facilitate logging operations. This can result in simultaneous regeneration harvest and thinning of potentially suitable habitat over large areas. In addition, some of the project area has been permanently fragmented by private land ownership, which tends to convert forest cover to farmland or developed land.

Reynolds et al. (1992) and Graham et al. (1994) state that the nesting home range of goshawks contains three components: the nest area, the post-fledging family area, and the foraging area. Table 4 illustrates some of the biological functions associated with these three habitat components:

Table 5. Biological function of the three components of goshawk home range.

Biological function	Nest area	Post-fledging	Foraging
Courtship and breeding	x		
Egg-laying and incubation	x		
Security for the female and young	x	x	
Foraging for young and female until dispersal occurs	x	x	
Alternate nest sites	x	x	
Nest and territory defense	x	x	
Foraging for adults and juveniles, and especially male during nesting			x
Security for adults and juveniles, and especially the male, while foraging			x

Goshawks are sensitive to disturbance at nest and roost sites and nest abandonment has been documented within 300 feet of logging or recreational camping (Squires and Reynolds 1997).

Analysis Indicator: To assess the change in habitat and effects to goshawks, I measured the amount of roads open to motorized vehicles within post-fledging areas of any known nest in the last three years on the Superior to assess the impacts of this project on known goshawk territories. I used post-fledging since it also incorporates the nesting area within the buffer. I also analyzed the effects of this project on possible foraging habitat forest-wide by measuring the

amount of roads open to motorized vehicles within large mature upland patches over the whole Forest.

Direct/Indirect Effects

Vehicle use could disturb a nesting pair of northern goshawk during the breeding season of March 1 to August 31. Vehicle use would be most disruptive in the nesting analysis area from 0 to 860 feet of the nest tree. Vehicle use could also disturb adults as they feed their young in the post-fledging analysis area from 860 feet to 0.5 miles from the nest tree.

Table 6. Miles of road open to motorized vehicles within goshawk post-fledging area and large mature patches > 300 acres.

Indicator of project effects*	Alt 1 (Existing)	Alt 2 (MPA)	Alt 3 (More)	Alt 4 (Less)
Northern goshawk post-fledging areas	143	136	141	106
Large mature upland patches > 300 acres	468	443	470	367

* All indicators are miles of road open to all motor vehicles which including highway vehicles as well as OHVs.

Conclusion: Overall, all action alternatives show a decrease in miles of motorized road within goshawk post-fledging areas with Alternative 4 showing the greatest reduction followed by Alt. 2, and Alt. 3. Also, all action alternatives show a decrease in miles of motorized road within goshawk foraging areas (using large mature patches greater than 300 acres as a surrogate) with Alternative 4 showing the greatest reduction followed by Alt. 2, and Alt. 3.

Cumulative Effects
See Appendix x in the EA for a list of past, present, and reasonably foreseeable projects analyzed in this cumulative effects section

Past impacts: Minnesota off highway vehicle registrations has increased dramatically, from 9,204 registrations in 1994 to 222,594 registrations in 2004. Increased human access may result in disturbance during the breeding season.
Present impacts: The Minnesota Department of Natural Resources is in the process of classifying their lands within and adjacent to the Superior.
Future impacts: Although the northern goshawk may benefit from the action alternatives on Federal Lands, the off highway vehicle project may shift the demand for access to State and County lands within the Superior National Forest. Please refer to the cumulative effects section for the gray wolf.

Mitigation Measures
None.

Conclusions and Determinations
Alternatives 1, 2, 3, and 4 **may impact** individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. Alternative

4 best supports northern goshawk conservation by reducing possible disturbance to goshawks by reducing road miles within post-fledging and possible foraging habitat, followed by Alternative 2, Alternative 3, and Alternative 1.

LARGE AND MATURE UPLAND FOREST PATCH GUILD

Black-throated blue warbler *(Dendroica caerulescens)*
Bay-breasted warbler *(Dendroica castanea)*
Connecticut Warbler *(Oporomis agilis)*
Three-toed woodpecker *(Picoides tridactylus)*
Boreal owl (*Aegolius funereus*)
Great gray owl *(Strix nebulosa)*

Effects of Proposed Activities

Off highway vehicle use could disturb nesting pairs of black-throated blue warblers, bay-breasted warblers, Connecticut warblers, black-backed woodpeckers, boreal owls or great gray owls. Although the Northern goshawk also prefers large and mature forest, the 6 previous bird species usually do not have specified historic nesting areas around which to conduct an analysis. Each species prefers a unique habitat, but they can be grouped together since they may be found in large and mature upland forest patches. A patch of mature forest is defined as any forest type that is at least 50 years old, and at least 40 acres in size. The edge effects caused by nest predators and brood parasitism may penetrate over 300 feet into the forest, so patches smaller than 300 acres provide less value in terms of mature interior forested habitat for migratory birds, because they contain relatively small amounts of effective forest interior. Standards and guidelines for large mature upland forest patches are found on pages 2-26 and 2-27 of the Forest Plan.

Analysis Indicators

Mature upland patches over 300 acres were analyzed for off highway vehicle use by alternative, in order to indicate in a general way the effects of project activities to each species.

Direct and Indirect Effects

Table 7. Total vehicle miles in large mature upland forest patches > 300 acres by alternative.

Indicator of project effects*	Alt 1 (Existing)	Alt 2 (MPA)	Alt 3 (More)	Alt 4 (Less)
Large mature upland patches > 300 acres (miles)	468	443	470	367

* All indicators are miles of road open to all motor vehicles which including highway vehicles as well as OHVs.

Conclusion: Two of three action alternatives would reduce amounts of road fragmentation and human disturbance to sensitive species in large and mature upland forest patches, with Alternative 4 being the most desirable followed by Alt. 2, Alt, 1 and Alt. 4.

Cumulative Effects

See Appendix x in the EA for a list of past, present, and reasonably foreseeable projects analyzed in this cumulative effects section

Past impacts: Minnesota off highway vehicle registrations has quadrupled, from 9,204 registrations in 1994 to 222,594 registrations in 2004. Increased human access may result in disturbance during the breeding season.
Present impacts: The Minnesota Department of Natural Resources is in the process of classifying their lands within and adjacent to the Superior.
Future impacts: Although the black-throated blue warbler, bay-breasted warbler, Connecticut warbler, black-backed woodpecker, boreal owl and great gray owl may benefit from the action alternatives on Federal Lands, the off highway vehicle project may shift the demand for access to State and County lands within the Superior National Forest. Please refer to the cumulative effects section for the gray wolf.

Mitigation Measures
None.

Determination
Alternatives 1, 2, 3, and 4 **may impact** individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. Alternative 3 best supports, by reducing possible disturbance of species within these large mature patches, black-throated blue warbler, bay-breasted warbler, Connecticut warbler, black-backed woodpecker, boreal owl and great gray owl conservation, followed by Alternative 2, Alternative 1, and Alternative 3.

AQUATIC SPECIES GUILD

Wood turtle (*Clemmys insculpta*)
Lake sturgeon (*Acipenser fulvescens*)
Short-jaw cisco (*Coregonus zenithicus*)
Northern brook lamprey (*Ichthyomyzon fossor*)
Creek Heelsplitter (*Lasmigona compressa*)
Black Sandshell (*Ligumia recta*)

Effects of Proposed Activities
Off highway vehicle use could indirectly affect aquatic sensitive species by causing erosion and sedimentation into lakes and streams. Sensitive fish species require clean lakes and rivers, with sand and gravel substrates, and abundant submergent aquatic vegetation. Gravel reefs create a riffle habitat, and the gentle turbulence stimulates fish to spawn. The turbulence oxygenates the water, keeps the surface clear of any fine sediment, and benefits the deposited fish eggs. Abundant submerged aquatic vegetation provides a refuge for developing fish fry from larger predators. Threats to the species include off-highway vehicle use, which can cause erosion, siltation of spawning riffles, and smothering of aquatic vegetation. Migration barriers that deny fish access to upstream spawning beds include beaver dams, and culverts that are above the stream surface. Narrow stream crossing structures would increase water turbulence and velocity during peak flood events, can cause stream scour and sedimentation, and can impede migration of slower swimming fish species during the spawning season.

Sensitive mollusks may be found in mud, sand, or fine gravel of small to large rivers with slow to moderate flow. Freshwater mussels have been experiencing declines in species diversity and population size for at least 100 years in part due to siltation from off-highway vehicle use. These mussels are extremely sensitive to water quality, and the larvae are dependent upon fish hosts to metamorphose from planktonic larvae to sessile adult mussels. Any road crossing streams that blocks fish migration, would also limit the dispersal and distribution of sensitive mussel species. Roads in riparian areas can also lead to direct mortality of wood turtles with vehicles and also can increase the collection of wood turtles for the pet trade. Standards and guidelines for riparian areas are found on pages 2-13 to 2-15 of the Forest Plan.

Analysis Indicators
Analysis of miles of road within the nearbank riparian zone (100 feet from lakes, rivers and streams) and number of road/stream crossings were conducted to determine possible amounts of disturbance from siltation and migration barriers to aquatic species.

Direct and Indirect Effects

Table 8. Off highway vehicle miles in the riparian areas by alternative.

Indicator of project effects	Alt 1 (Existing)	Alt 2 (MPA)	Alt 3 (More)	Alt 4 (Less)
Miles in nearbank riparian	26.3	10.8	17.2	7.4
No. of stream crossings	317	121	200	73

Conclusion: All action alternatives would reduce the potential for erosion and sedimentation within the nearbank riparian zone, with Alternative 4 being the most desirable followed by Alt. 2, Alt. 3 and Alt. 1. All action alternatives would reduce the potential for erosion and sedimentation by reducing the number of road/stream crossings, with Alternative 4 being the most desirable followed by Alt. 2, Alt. 3 and Alt. 1.

Cumulative Effects
See Appendix x in the EA for a list of past, present, and reasonably foreseeable projects analyzed in this cumulative effects section

Past impacts: Minnesota off highway vehicle registrations has increased dramatically, from 9,204 registrations in 1994 to 222,594 registrations in 2004. Increased human access may result in increased erosion and sedimentation into lakes and streams.
Present impacts The Minnesota Department of Natural Resources is in the process of classifying their lands within and adjacent to the Superior.
Future impacts: Although the wood turtle, lake sturgeon, short-jaw cisco, northern brook lamprey, creek heelsplitter and black sandshell may benefit from the action alternatives on Federal Lands, the off highway vehicle project may shift the demand for access to State and County lands within the Superior National Forest. Please refer to the cumulative effects section for the gray wolf.

Mitigation Measures
None.

Conclusion and Determination
Alternatives 1, 2, 3, and 4 **may impact** individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. Alternative 4 best supports wood turtle, lake sturgeon, short-jaw cisco, northern brook lamprey, creek heelsplitter and black sandshell conservation by reducing road miles and stream crossings, followed by Alternative 2, Alternative 3, and Alternative 1.

SENSITIVE SPECIES: VASCULAR PLANTS, LICHENS, AND BRYOPHYTES

ANALYSIS AREA AND METHODS
For sensitive plants, the area covered by the analysis of direct and indirect effects includes all Superior National Forest lands where changes in travel management are proposed. This area was selected because this is where project activities will occur which cause the direct and indirect effects. Not included in this project is the Boundary Waters Canoe Area Wilderness where motorized use is restricted by legislation. Although no decisions will be made for lands within the BWCAW, the effects to the wilderness will be considered as part of this analysis. The area covered by the cumulative effects analysis includes lands of all ownerships within the Travel Management Project Area. This cumulative effects analysis area was selected because non-Forest Service lands within Project Area boundaries share a number of physical characteristics (e.g. bedrock features, land forming processes) with adjacent Forest Service lands. These characteristics influence land uses, which in turn influence rare plant distribution throughout the Project Area, so the Project Area boundary makes a logical analysis unit for cumulative effects.

The time period for direct, indirect, and cumulative effects is fifteen years including the past 10 years and the next 5 years. This time scale incorporates recent projects that have affected sensitive plants in the project area. The future time frame is realistic since any potential effects to sensitive plants, such as habitat disturbance or effects from noxious weeds, are likely to occur rapidly.

One indicator was used to help evaluate the potential effects of the Travel Management Project on RFSS plants (Table 8). This indicator describes the number of known RFSS plant occurrences less than 200 feet from routes that are proposed to be open to OHV. This indicator does a good job of evaluating impacts and distinguishing between alternatives because it highlights how much potential off-highway vehicle traffic would be occurring in proximity to known RFSS plant occurrences. This indicator is also representative of the degree of impacts that would occur in suitable sensitive plant habitat.

For ease of analysis and to reduce repetitiveness, the RFSS plants have been grouped into 6 habitat groups or guilds (Table 8). The habitat groups are described in more detail in the Biological Evaluation for the Forest Plan for the Superior National Forest (USDA Forest Service 2004b)

Table 8. Number of RFSS plant populations known from <200 feet from routes proposed as open to OHM, OHV, or ATV

Guild	Alternative 1	Alternative 2	Alternative 3	Alternative 4
1. RFSS plants of non-forested wetlands, shallow water, and riparian areas	24	7	11	6
2. RFSS plants of cliffs and talus slopes	0	0	0	0
3. RFSS plants of upland disturbed areas (old landings, old roadbeds, etc.)	21	6	9	0
4. RFSS plants of forested wetlands	1	4	5	3
5. RFSS plants of northern hardwood forests (sugar maple, basswood, yellow birch, red oak)	6	3	4	0
6. RFSS plants of dry to mesic upland forests	29	10	15	7
TOTALS	81	30	44	14

As noted earlier in this BE, project surveys were not conducted for regional forester sensitive species. This project would only produce a motor vehicle use map. No surveys were conducted because the action alternatives 2, 3, 4 would have less impact than the no action Alternative 1.

All sensitive vascular and non-vascular plant species known or suspected to occur in the project area are displayed in Table 2B. These species are analyzed below. The only plants whose habitat would not be affected by this project are long leaved arnica, maidenhair spleenwort, Appalachian fir clubmoss, creeping rush, sticky locoweed, nodding saxifrage, encrusted saxifrage, false asphodel, smooth woodsia, *Arctoparmelia centrifuga*, and *Arctoparmelia subcentrifuga*. These species are not analyzed further in this BE.

The analysis below is performed using the data contained in the MNDNR Natural Heritage Database (MN DNR 2007).

ENVIRONMENTAL CONSEQUENCES

All three of the action alternatives would have less impact on sensitive plants than the No Action Alternative. Alternatives 2, 3, and 4 propose 157, 78, and 184 miles of decommissioning of unclassified road, compared to no decommissioning under Alternative 1. Decommissioning unclassified roads would benefit sensitive plant habitat by reducing the risk of invasive plant impacts and reducing the potential for direct disturbance of sensitive plants by OHVs.

Alternatives 2-4 would all reduce the amount of unmanaged, unclassified roads relative to Alternative 1. Converting some of these unclassified roads to managed system roads would greatly reduce the chances for off-site impacts to sensitive plant habitat from processes such as erosion. Off-site impacts are much more likely with unclassified roads, which receive no maintenance, compared to roads that are part of the maintained road system.

For all alternatives, relatively little suitable habitat would be directly or indirectly affected by OHV use. Impacts would primarily be occurring on the existing road surface, which only a few plants use as suitable habitat, or on a narrow margin of habitat alongside the existing road. Consider Alternative 3, which has the greatest amount of roads available for ATV/OHM use, 1781 miles. If ATV/OHM use impacts suitable habitat for 10 feet on either side of all these miles, that still represents only 4318 acres of impacts to suitable habitat, relative to all the suitable habitat available in the entire 2.2 million acre Superior National Forest. When considered from a Forest-wide perspective, only a relatively small proportion of suitable sensitive plant habitat would be affected by these proposals.

Habitat Group 1: RFSS plants of shallow water and non-forested wetlands and riparian areas

Existing Condition
The following sensitive plants use this habitat group and either occur in or have suitable habitat in the analysis area (Table 2B): alpine milkvetch, swamp beggar-ticks, floating marsh-marigold, Katahdin sedge, linear-leaved sundew, neat spike rush, moor rush, auricled twayblade, fall dropseed muhly, American shoregrass, dwarf water lily, club-spur orchid, northern bur-reed, awlwort, and lance-leaved violet.

Direct/Indirect Effects
Alternative 1
For the No Action Alternative, there are 24 RFSS plant occurrences from this habitat group less than 200 feet from a route that would be open to OHV (Table 8). Most of these known occurrences are found in wetlands away from the potential routes and would not be directly impacted by OHV use under this alternative. However, two species, neat spike rush and clustered bur reed, do grow in or adjacent to routes, either on a moist road surface or in a ditch adjacent to routes. These species could be directly impacted by being driven over by OHV. They could also be impacted by any invasive plants spread by these vehicles along the edge habitat that exists in road corridors. There could also be indirect impacts caused by fugitive dust from highway vehicle use or OHV use; dust blanketing sensitive plants or suitable habitat could impact their growth and survival (Ouren et al. 2007). However, use of these roads could also benefit these two species by keeping the habitat open and in full sunlight, and by spreading their seeds to new areas via tires. The negative impacts would be somewhat offset by the positive impacts, and these species would continue to occupy suitable habitat on the Forest.

Suitable habitat for species in this habitat group could be impacted by the No Action Alternative. Some of the routes pass through suitable wetland habitat, and illegal OHV use in the wetland could occur, although probably not to a great extent. Such use could negatively affect suitable habitat for most of these species. The only exceptions, as described above, would be for neat spike rush and clustered bur reed, which could also experience some benefits from such disturbance. Another potential impact is the spread of noxious weeds.

In general, the overall scale of Alternative 1 impacts to sensitive plants or suitable habitat in this guild would be moderate and would not result in any significant reduction to the amount of

suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 2
For the Modified Proposed Action (MPA), there are 7 RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to known occurrences and to suitable habitat would be the same as described for the No Action Alternative, only much smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 3
For the More Alternative, there are 11 RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to known occurrences and to suitable habitat would be the same as described for the No Action Alternative, only much smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 4
For the Less Alternative, there are 6 RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to known occurrences and to suitable habitat would be the same as described for the No Action Alternative, only much smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Cumulative Effects
There would be few cumulative effects of any of the 4 alternatives on these species since very little suitable habitat would be affected by OHV use under any of the alternatives. In the past, construction and use of lowland roads and wetland draining were the two actions that probably had the biggest impacts on species in this habitat group within the cumulative effects analysis area. At present and in the future, construction and use of roads in lowlands in the cumulative effects analysis area, including construction of non-jurisdictional roads, future special use permit roads, roads and trails associated with state and county OHV planning, and roads associated with county, state, or federal timber sales would continue to impact suitable habitat, but the proportion of total suitable habitat affected by these activities would be very small.

Summary: Project activities associated with Alternatives 2, 3, and 4 would have only minor direct and indirect negative effects on the suitable habitat for these species, while Alternative 1 would have slightly greater negative effects. Alternative 1 would have the greatest effects, followed by Alternative 3, then Alternative 2, and then Alternative 4, which would have the least effects.

Determination
For Alternatives 1, 2, 3, and 4, the proposed activities may impact individuals of alpine milkvetch, swamp beggar-ticks, floating marsh-marigold, Katahdin sedge, linear-leaved sundew, neat spike rush, moor rush, auricled twayblade, fall dropseed muhly, American shoregrass, dwarf water lily, club-spur orchid, northern bur-reed, awlwort, and lance-leaved violet, but are not likely to cause a trend to federal listing or loss of viability.

Habitat Group 2: RFSS plants of cliffs and talus slopes

Existing Condition
The following sensitive plants use this habitat group and either occur in or have suitable habitat in the analysis area (Table 2B): *Cladonia wainoi*, large-leaved sandwort, and Ross' sedge.

Direct/Indirect Effects
Alternative 1
There are no known occurrences of any species in this habitat group that would be affected by the No Action Alternative (Table 8). In some cases these plants occur on cliffs or talus slopes, but they also may occur on generally rocky, broken ground. Some routes in the No Action Alternative pass through this latter type of suitable habitat. Illegal OHV use off of Alternative 1 routes could occur, although probably not to a great degree. If this use occurred in this type of rocky habitat, it could directly negatively impact suitable habitat for these plants. In addition, OHV use could lead to the spread of noxious weeds along routes, which could also impact suitable habitat for these plants. There could also be indirect impacts caused by fugitive dust from highway vehicle use or OHM use; dust blanketing sensitive plants or suitable habitat could impact their growth and survival (Ouren et al. 2007). However, the overall proportion of habitat impacted by any of these effects would likely be very small. In general, the overall scale of impacts to sensitive plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 2
For the Modified Proposed Action (MPA), there are no known RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to suitable habitat would be the same as described for the No Action Alternative, only much smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 3
For the More Alternative, there are no known RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to suitable habitat would be the same as described for the No Action Alternative, only smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant

reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 4
For the Less Alternative, there are no known RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to suitable habitat would be the same as described for the No Action Alternative, only much smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Cumulative Effects
There would be few cumulative effects of any of the 4 alternatives on these species since very little suitable habitat would be affected by OHV use under any of the alternatives. Since Europeans began settling the area, there have been relatively few past actions that have impacted this habitat within the cumulative effects analysis area except for road construction and occasional timber harvest. For example, past vegetation management projects may have had some small direct or indirect impacts on cliff or rock outcrop habitat. Current and future actions in the cumulative effects analysis area that could affect this habitat include both road construction and timber harvest. Construction of future special use or non-jurisdictional roads could impact a small amount of rock outcrop habitat, as could current federal timber sales as well as future federal and non-federal timber sales. Road or trail construction associated with state or county OHV planning could also impact a small amount of suitable habitat. However, cumulative impacts of the four alternatives would be minimal because these habitats are quite dispersed and only a small proportion of this suitable habitat would be affected by management activities.

Summary: Project activities associated with Alternatives 1, 2, 3, and 4 would have only minor direct and indirect negative effects on the suitable habitat for these species.

Determination
For Alternatives 1, 2, 3, and 4, the proposed activities may impact individuals of *Cladonia wainoi*, large-leaved sandwort, and Ross' sedge, but are not likely to cause a trend to federal listing or loss of viability.

Habitat Group 3: RFSS plants of upland disturbed areas

Existing Condition
The following sensitive plants use this habitat group and either occur in or have suitable habitat in the analysis area (Table 2B): pointed moonwort, common moonwort, Michigan moonwort, pale moonwort, ternate grapefern, least moonwort, and Douglas hawthorn. The moonwort and grapefern species often occur on infrequently-used road surfaces. Of all the RFSS plants, the moonwort and grapefern species in this habitat group are the most likely to have suitable habitat directly affected by the Travel Management Project.

Direct/Indirect Effects

Alternative 1

For the No Action Alternative, there are 21 RFSS plant occurrences from this habitat group less than 200 feet from a route that would be open to OHV (Table 8). Most of these known occurrences are found on or adjacent to an old road surface. These species could be directly impacted by being driven over by OHV. The exact impacts would depend on the frequency of use of the road. They could also be impacted by any invasive plants spread by these vehicles along the edge habitat that exists in road corridors. There could also be indirect impacts caused by fugitive dust from highway vehicle use or OHV use; dust blanketing sensitive plants or suitable habitat could impact their growth and survival (Ouren et al. 2007). However, use of these roads could also benefit these species by keeping the habitat open (i.e. not dominated by shrubs or trees - USDA Forest Service 2001a, b, c, d, and e) and in full sunlight, and by spreading their spores to new areas via tires. Also, the lack of any decommissioning in Alternative 1 would contribute to the roads continuing to serve as suitable habitat for these plants; road decommissioning would eventually lead to the the roads being re-forested, which would be a negative effect for these species. In general, the negative impacts would be offset by the positive impacts, and these species would continue to occupy suitable habitat on the Forest.

For example, one commenter mentioned several *Botrychium* species that occur on FR122E, an infrequently used OML 2 road open to OHV. Under Alternative 1, individuals from these plants could be affected by the suite of impacts described above. However, some road use would help keep the road in a more open condition so it can continue to serve as suitable habitat.

Suitable habitat for species in this habitat group would be impacted by the No Action Alternative in a similar manner to the known occurrences described above.

In general, the overall scale of Alternative 1 impacts to sensitive plants or suitable habitat in this guild would be moderate and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 2

For the Modified Proposed Action (MPA), there are 6 RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to known occurrences and to suitable habitat would be the same as described for the No Action Alternative, only much smaller in scale because less habitat would be affected by this alternative. Road decommissioning associated with the MPA could lead to some degradation of suitable habitat for these species as decommissioned roads become reforested. However, the overall impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 3

For the More Alternative, there are 9 RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to known occurrences and to suitable habitat would be the same as described for the No Action

Alternative, only much smaller in scale because less habitat would be affected by this alternative. Road decommissioning associated with Alternative 3 could lead to some degradation of suitable habitat for these species as decommissioned roads become reforested. However, the overall impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 4
For the Less Alternative, there are no known RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to known occurrences and to suitable habitat would be the same as described for the No Action Alternative, only much smaller in scale because less habitat would be affected by this alternative. Road decommissioning associated with Alternative 4 would be the highest of any alternative and could lead to some degradation of suitable habitat for these species as decommissioned roads become reforested. Despite the loss of habitat to road decommissioning, the overall impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Cumulative Effects
There would be few cumulative effects of any of the 4 alternatives on these species since very little suitable habitat would be affected by OHV use under any of the alternatives. Ongoing and future projects (for example, federal, state, or county timber harvest or road building, or state and county OHV planning) would continue within the cumulative effects analysis area. These activities, while sometimes impacting suitable habitat, would also create suitable habitat at the same time. Because ground disturbing activities have created ample suitable habitat in the past and at present, and because similar types of activities will probably occur into the future, it is unlikely that there will be any cumulative effects to species in this habitat group.

Summary: Project activities associated with Alternatives 2, 3, and 4 would have only minor direct and indirect negative effects on the suitable habitat for these species, while Alternative 1 would have slightly greater negative effects. Alternative 1 would have the greatest effects, followed by Alternative 3, then Alternative 2, and then Alternative 4, which would have the least effects.

Determination
For Alternatives 1, 2, 3, and 4,, the proposed activities may impact individuals of pointed moonwort, common moonwort, Michigan moonwort, pale moonwort, ternate grapefern, least moonwort, and Douglas hawthorn but are not likely to cause a trend to federal listing or loss of viability.

Habitat Group 4: RFSS plants of forested wetlands

Existing Condition
The following sensitive plants use this habitat group and either occur in or have suitable habitat in the analysis area (Table 2B): small shinleaf, cloudberry, fairy slipper, ram's head ladyslipper,

Western Jacob's ladder, *Caloplaca parvula*, *Certraria aurescens*, *Frullania selwyniana*, *Menegazzia terebrata*, *Ramalina thrausta*, *Sticta fuliginosa*, and *Usnea longissima*. *Pseudocyphellaria crocata* is analyzed here as well because local occurrences are found in open and forested peatlands.

Direct/Indirect Effects

Alternative 1

For the No Action Alternative, there is one RFSS plant occurrence from this habitat group less than 200 feet from a route that would be open to OHV (Table 8). This known sensitive plant occurrence is found in a forested wetland away from the potential routes and would not be directly impacted by OHV use under this alternative. However, it could be impacted by any invasive plants spread by these vehicles along the edge habitat that exists in road corridors. There could also be indirect impacts caused by fugitive dust from highway vehicle use or OHV use; dust blanketing sensitive plants or suitable habitat could impact their growth and survival (Ouren et al. 2007).

Suitable habitat for species in this habitat group could be impacted by the No Action Alternative. Some of the routes pass through suitable forested wetland habitat, and illegal OHV use in the wetland could occur, although probably not to a great extent. Such use could negatively affect suitable habitat for most of these species. Invasive plants and fugitive dust could also indirectly impact suitable habitat, as described above.

In general, the overall scale of Alternative 1 impacts to sensitive plants or suitable habitat in this guild would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 2

For the Modified Proposed Action (MPA), there are 4 RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The additional sensitive plants affected by the MPA are located in proximity to existing Forest Service system roads that would be open to OHV in Alternative 2, but not Alternative 1. These known sensitive plant occurrences are not located directly on a road, and would not be directly affected by Alternative 2. The types of indirect effects to known occurrences and to suitable habitat would be the same as described for the No Action Alternative, only smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 3

For the More Alternative, there are 5 RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The additional sensitive plants affected by the More Alternative are located in proximity to existing Forest Service system roads that would be open to OHV in Alternative 3, but not Alternative 1. These known sensitive plant occurrences are not located directly on a road, and would not be directly affected by Alternative 3. The types of indirect effects to known occurrences and to suitable

habitat would be the same as described for the No Action Alternative, only smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in significant any reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 4

For the Less Alternative, there are 3 RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The additional sensitive plants affected by the Less Alternative are located in proximity to existing Forest Service system roads that would be open to OHV in Alternative 4, but not Alternative 1. These known sensitive plant occurrences are not located directly on a road, and would not be directly affected by Alternative 4. The types of indirect effects to known occurrences and to suitable habitat would be the same as described for the No Action Alternative, only smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Cumulative Effects

There would be few cumulative effects of any of the 4 alternatives on these species since very little suitable habitat would be affected by OHV use under any of the alternatives. Since Europeans began settling the area, timber harvest, wetland drainage, and road construction have impacted forested wetlands and reduced the amount and distribution of this habitat within the cumulative effects analysis area (Bradof 1992, Heinselman 1996, Frelich 1998, MN FRC 1999a). More recently, timber sales on federal, State, county, and private lands have changed the age class distribution of lowland forest habitats, but have not altered the overall suitability of the habitat for sensitive species in this habitat group. At present and in the future, construction and use of roads in lowland forests elsewhere in the cumulative effects analysis area, including construction of non-jurisdictional roads, future special use permit roads, and state and county OHV planning, would continue to impact suitable habitat, but the proportion of total suitable habitat affected by these activities would be very small. Similarly, current and future timber sales affecting lowlands on state, county, or private land could change the age class of lowland black spruce forests in the project area, temporarily making some stands less suitable for this suite of sensitive plants. However, the proportion of total suitable habitat affected by these activities would be very small.

Summary: Project activities associated with Alternatives 2, 3, and 4 would have only minor direct and indirect negative effects on the suitable habitat for these species, while Alternative 1 would have slightly greater negative effects. Alternative 1 would have the greatest effects, followed by Alternative 3, then Alternative 2, and then Alternative 4, which would have the least effects.

Determination

For Alternatives 1, 2, 3, and 4, the proposed activities may impact individuals of small shinleaf, cloudberry, fairy slipper, ram's head ladyslipper, western Jacob's ladder, *Caloplaca parvula, Certraria aurescens, Frullania selwyniana, Menegazzia terebrata, Ramalina thrausta, Sticta*

fuliginosa, *Usnea longissima*, and *Pseudocyphellaria crocata*, but are not likely to cause a trend to federal listing or loss of viability.

Habitat Group 5: RFSS plants of northern hardwood forests

Existing Condition
The following sensitive plants use this habitat group and either occur in or have suitable habitat in the analysis area (Table 2B): moschatel, triangle grapefern, goblin fern, New England sedge, Chilean sweet cicely, and Braun's holly fern.

Direct/Indirect Effects
Alternative 1
For the No Action Alternative, there are 6 RFSS plant occurrences from this habitat group less than 200 feet from a route that would be open to OHV (Table 8). Most of these known occurrences are found in northern hardwood forest away from the potential routes and would not be directly impacted by OHV use under this alternative. However, one species, triangle grapefern, can occasionally grow on old, infrequently used road surfaces. This species could be directly impacted by being driven over by OHV. All the species in this group could also be impacted by any invasive species spread by OHV along the edge habitat that exists in road corridors. There could also be indirect impacts caused by fugitive dust from highway vehicle use or OHV use; dust blanketing sensitive plants or suitable habitat could impact their growth and survival (Ouren et al. 2007).

Suitable habitat for species in this habitat group could be impacted by the No Action Alternative. Some of the routes pass through suitable northern hardwood habitat, and illegal OHV use in this forest habitat could occur, although probably not to a great extent. Invasive species and fugitive dust could also indirectly impact suitable habitat, as described above.

In general, the overall scale of Alternative 1 impacts to sensitive plants or suitable habitat in this guild would be moderate and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 2
For the Modified Proposed Action (MPA), there are 3 RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to known occurrences and to suitable habitat would be the same as described for the No Action Alternative, only smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 3
For the More Alternative, there are 4 RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to known occurrences and to suitable habitat would be the same as described for the No Action

Alternative, only smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 4
For the Less Alternative, there are no known RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to suitable habitat would be the same as described for the No Action Alternative, only smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Cumulative Effects
There would be few cumulative effects of any of the 4 alternatives on these species since very little suitable habitat would be affected by OHV use under any of the alternatives. Since Europeans began settling the area, timber harvest (and subsequent forest type changes) and road construction are among the land uses that have most greatly impacted upland forests and altered the amount and distribution of this habitat in the cumulative effects analysis area. In the habitats where these species occur, some species like yellow birch, white spruce, and white cedar have decreased in abundance compared to the historical condition, while other species like aspen have increased (USDA Forest Service 2004b). More recently, timber sales on federal, state, and private lands have changed the age class distribution of upland forest habitats. Construction of federal and non-federal roads in the project area has also impacted a small proportion of suitable habitat for this suite of species. For these species, current and reasonably foreseeable timber harvest and road and trail construction (including any associated with state and county OHV planning) on lands in the cumulative effects analysis area would impact suitable habitat for this species, but negligible cumulative impacts would result because the proportion of total suitable habitat affected by these activities would be very small.

Summary:
Project activities associated with Alternatives 2, 3, and 4 would have only minor direct and indirect negative effects on the suitable habitat for these species, while Alternative 1 would have slightly greater negative effects. Alternative 1 would have the greatest effects, followed by Alternative 3, then Alternative 2, and then Alternative 4, which would have the least effects.

Determination
For Alternatives 1, 2, 3, and 4, the proposed activities may impact individuals of moschatel, triangle grapefern, goblin fern, New England sedge, Chilean sweet cicely, and Braun's holly fern, but are not likely to cause a trend to federal listing or loss of viability.

Habitat group 6: RFSS plants of dry to mesic upland forests

Existing Condition
The following sensitive plants use this habitat group and either occur in or have suitable habitat in the analysis area (Table 2B): Canada yew, barren strawberry, Canada ricegrass, rough-fruited fairy bells, and *Peltigera venosa*. *Peltigera venosa*, although not included as part of any habitat group in the Forest Plan BE, is analyzed with this habitat group in this BE because of its affinity for bare soil habitats such as rootwads.

Direct/Indirect Effects
Alternative 1
For the No Action Alternative, there are 29 RFSS plant occurrences from this habitat group less than 200 feet from a route that would be open to OHV (Table 8). Most of these known occurrences are found in upland forest habitat away from the potential routes and would not be directly impacted by OHV use under this alternative because trees and shrubs would prevent OHVs from straying from legal trails. All the species in this group could also be impacted by any invasive plants spread by OHV along the edge habitat that exists in road corridors. There could also be indirect impacts caused by fugitive dust from highway vehicle use or OHV use; dust blanketing sensitive plants or suitable habitat could impact their growth and survival (Ouren et al. 2007).

Suitable habitat for species in this habitat group could be impacted by the No Action Alternative. Some of the routes pass through suitable upland forest habitat, and illegal OHV use in this forest habitat could occur, although probably not to a great extent due to tree and shrub cover. Invasive plants and fugitive dust could also indirectly impact suitable habitat, as described above.

In general, the overall scale of Alternative 1 impacts to sensitive plants or suitable habitat in this guild would be moderate and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 2
For the Modified Proposed Action (MPA), there are 10 RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to known occurrences and to suitable habitat would be the same as described for the No Action Alternative, only smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 3
For the More Alternative, there are 15 RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to known occurrences and to suitable habitat would be the same as described for the No Action Alternative, only smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Alternative 4
For the Less Alternative, there are 7 RFSS plant occurrences from this habitat group that are less than 200 feet from a route that would be open to any OHV (Table 8). The types of effects to known occurrences and to suitable habitat would be the same as described for the No Action Alternative, only smaller in scale because less habitat would be affected by this alternative. The impacts to plants or suitable habitat in this habitat group would be low and would not result in any significant reduction to the amount of suitable habitat on the Forest or in any threats to the continued existence of these plants on the Forest.

Cumulative Effects
There would be few cumulative effects of any of the 4 alternatives on these species since very little suitable habitat would be affected by OHV use under any of the alternatives. Since Europeans began settling the area, timber harvest (and subsequent forest type changes) and road construction are among the land uses that have most greatly impacted upland forests and altered the amount and distribution of this habitat in the cumulative effects analysis area. Some upland forest types like aspen have increased in acreage since pre-settlement times, while other forest types like red, white and jack pine have decreased (Frelich 1998). More recently, timber sales on federal and State lands have changed the age class distribution of upland forest habitats. Construction of federal and non-federal timber harvest roads have also impacted a small proportion of suitable habitat for these species. Ongoing and future road or trail construction in the cumulative effects analysis area, including construction of non-jurisdictional roads, future special use permit roads, and state and county OHV planning, would impact suitable habitats for this suite of rare plants, but would not result in cumulative impacts because these activities would affect only a small proportion of the available suitable habitat.

Summary: Project activities associated with Alternatives 2, 3, and 4 would have only minor direct and indirect negative effects on the suitable habitat for these species, while Alternative 1 would have slightly greater negative effects. Alternative 1 would have the greatest effects, followed by Alternative 3, then Alternative 2, and then Alternative 4, which would have the least effects.

Determination
For Alternatives 1, 2, 3, and 4, the proposed activities may impact individuals of Canada yew, barren strawberry, Canada ricegrass, rough-fruited fairy bells, or *Peltigera venosa* but are not likely to cause a trend to federal listing or loss of viability.

REFERENCES

Bradof, K.L. 1992. "Ditching of Red Lake Peatland during the homestead era." In: *The Patterned Peatlands of Minnesota*. Ed. Wright, H.E., B.A. Coffin, N.E. Aaseng. University of Minnesota Press, Minneapolis, MN. Pp. 263-284.

Carlson, B., and N. Sather. 2001. Western Jacob's ladder, a true rarity. Unpublished report, Minnesota County Biological Survey, St. Paul, Minnesota. 2 p.

Coffin, B., and L. Pfannmuller, editors. 1988. Minnesota's endangered flora and fauna. University of Minnesota Press and Minnesota Dept. Natural Resources. 473pp.

Critical Connections Ecological Services. 2006. Rare plant survey report. Unpublished report on file at USDA Forest Service, Aurora, Minnesota. Pages unnumbered.

Delaney, B. 2005. Rare plant search Superior National Forest. Unpublished report on file at USDA Forest Service, Aurora, Minnesota. Pages unnumbered.

Delaney, B. 2006. Rare plant search Superior National Forest. Unpublished report on file at USDA Forest Service, Aurora, Minnesota. Pages unnumbered.

Frelich, L. 1998. Natural variability of forested ecosystems in northern Minnesota. Unpublished report, University of Minnesota, St. Paul, Minnesota. 15 p.

Gerdes, L. 2005. Canada rice-grass: species new to Minnesota! Unpublished report. Minnesota County Biological Survey. St. Paul, Minnesota. 3 pp.

Gerdes, L. 2005a. Slender rush: species new to Minnesota! Unpublished report. Minnesota County Biological Survey. St. Paul, Minnesota. 3 pp.

Gundale, M.J. 2002. Influence of exotic earthworms on the soil organic horizon and the rare fern *Botrychium mormo*. Conservation Biology 16(6): 1555-1561.

Heinselman, M. 1996. The Boundary Waters wilderness ecosystem. University of Minnesota Press, Minneapolis, Minnesota. Pp. 18, 97-111.

Iverson, G.C., and B. René. 1997. Conceptual approaches for maintaining well-distributed, viable wildlife populations: a resource assessment. Pages 1-23 in K.R. Julin, compiler, Assessments of wildlife viability, old-growth timber volume estimates, forested wetlands, and slope stability. USDA Forest Service General Technical Report PNW-GTR-392.

Knowles, B. 2001. email to Jack Greenlee, October 11, 2001.

Minnesota Department of Natural Resources - Natural Heritage and Non-Game Research Program. 2006. Rare Features Database: rare plant occurrences on the Superior National Forest. St. Paul, Minnesota.

Minnesota Forest Resource Council. 1999a. Minnesota northeast landscape conditions and trends assessment. Minnesota Forest Resource Council document LT-0799. St. Paul, Minnesota. Pp. 37-41, 95-105.

Ouren et al. 2007

Reynolds, R.T., R.T. Russell, M.H. Reiser, and others. 1992. Management recommendations for the northern goshawk in the southwestern United States. USDA Forest Service General Technical Report RM-217, Ft. Collins, CO. 90pp.

Schmoller, D. 1999. Species Data Form, *Taxus canadensis*. Unpublished report on file at USDA Forest Service, Duluth, Minnesota. 12pp.

Schmoller, D. 2001. Superior National Forest Gunflint Ranger District rare plant surveys 2001. Unpublished report on file at USDA Forest Service, Grand Marais, Minnesota, pages unnumbered.

Smith, W.R. 1993. Orchids of Minnesota. University of Minnesota Press, Minneapolis, Minnesota. 172 p.

Squires, J.R., and R.T. Reynolds. 1997. Northern goshawk (*Accipiter gentilis*). In A. Poole and F. Gill, editors, The Birds of North America, No. 298. The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

USDA Forest Service. 2000a. Lichen PVA Panel Notes. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. Pp. 10-11.

USDA Forest Service. 2000b. Population viability assessment workshop notes, Duluth, MN, 11-13 January 2000.

USDA Forest Service. 2001a. Conservation Assessment for western moonwort (*Botrychium hesperium*). Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 35 p.

USDA Forest Service. 2001b. Conservation Assessment for common moonwort (*Botrychium lunaria*). Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 39 p.

USDA Forest Service. 2001c. Conservation Assessment for pale moonwort (*Botrychium pallidum*). Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 38 p.

USDA Forest Service. 2001d. Conservation Assessment for ternate grapefern (*Botrychium rugulosum*). Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 46 p.

USDA Forest Service. 2001e. Conservation Assessment for least grapefern (*Botrychium simplex*). Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 52 p.

USDA Forest Service. 2002a. Conservation assessment for *Arctoparmelia centrifuga*. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 11 p.

USDA Forest Service. 2002c. Conservation assessment for *Caloplaca parvula*. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 10 p.

USDA Forest Service. 2002d. Conservation assessment for *Certraria aurescens*. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 11 p.

USDA Forest Service. 2002e. Conservation assessment for *Cladonia wainoi*. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 10 p.

USDA Forest Service. 2002h. Conservation assessment for *Menegazzia terebrata*. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 15 p.

USDA Forest Service. 2002i. Conservation assessment for *Peltigera venosa*. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 11 p.

USDA Forest Service. 2002j. Conservation assessment for *Pseudocyphellaria crocata*. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 11 p.

USDA Forest Service. 2002k. Conservation assessment for *Ramalina thrausta*. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 11 p.

USDA Forest Service. 2002l. Conservation assessment for *Sticta fuliginosa*. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 11 p.

USDA Forest Service. 2002m. Conservation assessment for *Usnea longissima*. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 13 p.

USDA Forest Service. 2002n. Conservation approach for goblin fern (*Botrychium mormo* W.H. Wagner). Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 30 p.

USDA Forest Service 2004a. Superior National Forest Land and Resource Management Plan. Superior National Forest. Duluth, Minnesota. P. 74.

USDA Forest Service. 2004c. Superior National Forest rare plant occurrence records – new records and non-MNDNR tracked records. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 10 p.

USDA Forest Service. 2004g. Conservation assessment for Lance-leaved Violet (*Viola lanceolata var. lanceolata)*. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 22 p.

USDA Forest Service. 2005. Trygstad *Waldsteinia fragarioides* monitoring results: 2003-2004. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 4 p.

USDA Forest Service. 2006. Whyte EA in house TES plant surveys. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808. 1 p.

USDA Forest Service. 2007. Regional forester sensitive plants and animals, signed by regional forester on 16 January 2007. Administrative report in planning record. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, Minnesota 55808.

Walton, G. 1998. The 1998 Big Grass rare plant survey in the Superior National Forest Kawishiwi District. Unpublished report on file at USDA Forest Service, Aurora, Minnesota. 18 p.

Walton, G. 1999. The 1999 Junction Project rare plant survey in the Superior National Forest Laurentian District. Unpublished report on file at USDA Forest Service, Aurora, Minnesota. 13 p.

Walton, G. 2000a. The 2000 Big Rice rare plant survey in the Laurentian District of the Superior National Forest. Unpublished report on file at USDA Forest Service, Aurora, Minnesota. 25 p.

Walton, G. 2000c. The 2000 Metroplus rare plant survey in the Superior National Forest Kawishiwi District. Unpublished report on file at USDA Forest Service, Ely, Minnesota. 21 p.

Walton, G. 2001. The 2001 Sensitive Plant Survey in the Superior National Forest Kawishiwi District: Burntside Area, Bear Island Land Exchange, Ojibway Lake Summer Homes, and Permanent Road Access (Request 6832). Unpublished report on file at USDA Forest Service, Ely, Minnesota. 46 pp.

Wetmore, C. 2000. Rare lichen survey of Superior National Forest. Unpublished report on file at USDA Forest Service, Duluth, Minnesota. Pages unnumbered.