McCaslin Project DEIS
Appendix D -- Additional Wildlife Information

Table D-1.Chequamegon-Nicolet National Forest Threatened Endangered (TES) and Forest Regional Foresters Sensitive Species (RFSS) status in McCaslin Project Area.

Scientific Name	Common Name	Global/State Rank*	LOO**	Potential Habitat
TES				
Canis lupus	Timber Wolf	G4 S2 FE ST	Minimal	Yes
Haliaeetus leucocephalus	Bald Eagle	G4 S2NS3B FT SC	Confirmed	Yes
Lynx canadensis	Canada Lynx	G5 SA FT SC	None	No
Nicrophorus americanus	American burying beetle	G2G3 SH FE SE	None	No
Oxytropis campestris var chartacea	Fassett's Locoweed	G5T1 S2 FT SE	None	No
Lycaeides melissa samuelis	Karner blue butterfly	G5T2 S2S3 FE SC	None	No
RFSS (Fauna)				
Accipiter gentiles	Northern goshawk	G5 S2N S2S3B SC	Confirmed	Yes
Acipenser fulvenscens	Lake sturgeon	G3 S3 SC	None	No
Ammodramus leconteii	LeConte's sparrow	G4 S2B SC	Minimal	Yes
Bartramia longicauda	Upland sandpiper	G5 S2B SC	Minimal	Yes
Buteo lineatus	Red-shouldered hawk	G5 S1N S3S4B ST	Confirmed	Yes
Catharus ustulatus	Swainson's thrush	G5 S2B SC	Probable	Yes
Chlidonia niger	Black tern	G4 S3B SC	Minimal	Yes
Clemmys insculpta	Wood turtle	G4 S3 ST	Minimal	Yes
Cygnus buccinator	Trumpeter swan	G4 S1B SE	Minimal	Yes
Dendroica cerulea	Cerulean warbler	G4 S2S3B ST	Confirmed	Yes
Falcipennis Canadensis	Spruce grouse	G5 S2B S1S2N ST	Minimal	No
Gomphus viridifrons	Green-faces clubtail	G3 S3 SC	Minimal	Yes
Incisalia henrici	Henry's elfin butterfly	G5 S2 SC	Minimal	Yes
Lycaeides idas nabokovi	Northern blue butterfly	G5 S1 SE	Confirmed	Yes
Martes Americana	American (pine) marten	G5 S3 SE	Minimal	Yes
Moxostoma valenciennesi	Greater redhorse	G3 S2S3 ST	Minimal	Yes
Myotis septentrionalis	Northern (long-eared) myotis	G4 S4 SC	None	No
Notropis nogenus	Pugnose shiner	G3 S2S3 ST	Minimal	Yes
Oeneis chryxus	Brown (chryxus) arctic	G5 S2 SC	None	No
Ophiogomphus anomalus	Extra-striped snaketail	G3 S1 SE	Minimal	Yes
Ophiogomphus howei	Pygmy snaketail	G3 S3 ST	Minimal	Yes
Oporornis agilis	Connecticut warbler	G4 S3B SC	Confirmed	Yes
Phyciodes batesii	Tawny crescent spot	G4 S3 SC	Minimal	Yes
Picoides arcticus	Black-backed woodpecker	G5 S2B SC	Minimal	Yes
Pieris virginiensis	West Virginia white	G4 S2 SC	Probable	Yes
Pipistrellus subflavus	Eastern pipistrelle bat	G5 S3S4 SC	None	No
Plethobasus cyphysus	Bullhead mussel	G2G3 S1 SE	None	No
Somatochlora forcipata	Forcipate emerald	G5 S2S3	None	No

Scientific Name	Common Name	Global/State Rank*	LOO**	Potential Habitat
Stylurus scudderi	Zebra clubtail	G3 G4 S3 SC	Minimal	Yes
Tympanuchus phasianellus	Sharp-tailed grouse	G4 S2 SC	None	No
RFSS (Flora)				
Amerorchis rotundifolia	Round-leaved orchis	G5 S2 ST	Minimal	Yes
Arabis missouriensis	Missouri rock cress	G5 S2 SC	Confirmed	Yes
Asplenium trichomanes-ramosum	Green spleenwort	G4 S1 SE	Minimal	Yes
Astragalus alpinus	Alpine milkvetch	G5 S1 SE	None	No
Botrychium minganense	Mingan's moonwort	G4 S2 SC	Confirmed	Yes
Botrychium mormo	Goblin fern	G3 S3 SE	Confirmed	Yes
Botrychium oneidense	Blunt-lobed grape-fern	G4Q S2 SC	Confirmed	Yes
Botrychium rugulosum	Ternate grape-fern	G3 S2 SC	Minimal	Yes
Callitriche hermaphroditica	Northern water-starwort	G5 S2 SC	None	No
Calypso bulbosa	Fairy slipper	G5 S3 ST	Minimal	Yes
Cardamine maxima	Large toothwort	G5 S1 SC	Minimal	Yes
Carex assiniboinensis	Assiniboine sedge	G4G5 S3 SC	Probable	Yes
Carex backii	Rocky Mountain Sedge	G4 S1 SC	Probable	Yes
Carex crawei	Crawe's sedge	G5 S3 SC	None	No
Carex gynocrates	Northern bog sedge	G5 S3 SC	Minimal	Yes
Carex lenticularis	Shore sedge	G5, S2, ST	None	No
Carex livida var radicaulis	Livid sedge	G5T5 S2 SC	None	No
Carex michauxiana	Michaux's sedge	G5 S2 ST	None	No
Carex sychnocephala	Many-headed sedge	G4 S2 SC	None	No
Carex vaginata	Sheathed sedge	G5 S3 SC	Minimal	Yes
Ceratophyllum echinatum	Spineless hornwort	G4? S2 SC	None	No
Cynoglossum virginianum var boreale	Northern wild comfrey	G5T4T5	Confirmed	Yes
Cypripedium arietinum	Ram's-head lady's-slipper	G3 S2 ST	Minimal	Yes
Diplazium pycnocarpon	Glade fern	G5 S2 SC	None	No
Disporum hookeri	Fairy bells, Hooker's mandarin	G5	None	No
Dryopteris expansa	Spreading wood fern	G5 S2 SC	Minimal	Yes
Dryopteris filix-mas	Male fern	G5 S1 SC	None	No
Dryopteris fragrans var remotiuscula	Fragrant fern	G5T? S3 SC	Minimal	Yes
Eleocharis engelmannii	Engelmann's spike-rush	G4G5Q, S2, SC	None	No
Eleocharis olivacea	Capitate spike-rush	G5 S2 SC	None	No
Eleocharis quinqueflora	Few-flowered spike-rush	G5 S2 SC	None	No
Epilobium palustre	Marsh willow-herb	G5 S3 SC	Minimal	Yes
Equisetum palustre	Marsh horsetail	G5 S2 SC	Minimal	Yes
Eriophorum chamissonis	Rusty cotton-grass	G5 S2 SC	None	No
Geum macrophyllum var macrophyllum	Large-leaved avens	G5T5 S1 SC	None	No
Juglans cinerea	Butternut	G3G4 S3? SC	Confirmed	Yes
Juncus stygius	Moor rush	G5 S1 SE	None	No
Leucophysalis grandiflora	Large-flowered ground-cherry	G4? S1 SC	None	No
Littorella uniflora	American shore-grass	G5 S2 SC	None	No
Listera auriculata	Auricled twayblade	G3 S1 SE	None	No
Listera convallarioides	Broad-leaved twayblade	G5 S1 ST	None	No

Scientific Name	Common Name	Global/State Rank*	LOO**	Potential Habitat
Malaxis brachypoda	White adder's-mouth	G4Q S3 SC	Minimal	Yes
Medeola virginiana	Indian cucumber-root	G5 S3 SC	Confirmed	Yes
Moehringia macrophylla	Large-leaved sandwort	G4, S1, SE	None	No
Myriophyllum farwellii	Farwell's water-milfoil	G5 S3 SC	None	No
Panax quinquefolius	American ginseng	G3G4 S4 SC	Confirmed	Yes
Parnassia palustris	Marsh grass-of-parnassus	G5 S1 ST	None	No
Petasites sagittatus	Arrow-leaved sweet colt's-foot	G5 S3 ST	None	No
Platanthera flava var herbiola	Pale-green orchid	G4T4Q S2 ST	None	No
Piptatherum canadense	Canada mountain rice-grass	G5, S1, SC	None	No
Poa paludigena	Bog bluegrass	G3 S3 ST	None	No
Polemonium occidentale var lacustre	Western Jacob's-ladder	G5?T1Q S1 SE	None	No
Polystichum braunii	Braun's holly fern	G5 S2 ST	Confirmed	Yes
Potamogeton confervoides	Algal-like pondweed	G4 S3 ST	Minimal	Yes
Potamogeton hillii	Hill's pondweed	G3 S1 SC	None	No
Potamogeton pulcher	Spotted pondweed	G5 S1 SE	None	No
Pterospora andromeda	Giant pinedrops	G5 S1 SE	None	No
Pyrola minor	Lesser wintergreen	G5 S1 SE	None	No
Ranunculus gmelinii	Small yellow water-crowfoot	G5 S2 SE	Minimal	Yes
Ranunculus lapponicus	Lapland buttercup	G5 S1 SE	None	No
Rhynchospora fusca	Brown beak-sedge	G4G5 S2 SC	None	No
Streptopus amplexifolius	White mandarin	G5 S3 SC	None	No
Tiarella cordifolia	Heart-leaved foam flower	G5 S1 SE	Probable	Yes
Ulmus americana	American elm	G5?	Confirmed	Yes
Vaccinium caespitosum	Dwarf bilberry	G5 S2 END	Confirmed	Yes
Valeriana uliginosa	Marsh valerian	G4Q S2 ST	None	No

* Global and State Ranking

Global Element Rank:
- G1 - Critically imperiled globally
- G2 - Imperiled globally
- G3 - Very rare and local throughout range
- G4 - Apparently globally secure, rare in parts of range
- G5 - Demonstrably secure globally, rare locally

Federal Status:
- FT - Federally threatened
- FE - Federally endangered
- FP - Federally proposed

State Element Rank:
- S1 - Critically imperiled
- S2 - Imperiled
- S3 - Rare or uncommon
- SA - Accidental
- SH - Historical occurrence
- S#B - Long-distance migrant, breeding status
- S#N - Long-distance migrant, non-breeding status

State Status:
- SE - State endangered
- ST - State threatened
- SC -State special concern

** Likelihood of occurrence

Confirmed = habitat is present; species has been observed within or near (within 0.25 miles) the project/proposed project area; a documented occurrence is on file for uncommon or rare species.

Probable = habitat is suitable; species has been documented on the Forest but not necessarily within project/proposed project area. Likelihood of occurrence is high. (Consideration is given to transient species such as eastern timber wolf.)

Minimal = some habitat exists; species may or may not have been documented on Forest. Likelihood of occurrence within the project area or proposed project area is low.

None = species may occur within region, but has no recent record of occurrence on the Nicolet National Forest, and/or habitat within the project area does not exist, or is not suitable.

Table D-2. Species general habitat description and rational for inclusion or exclusion of EIS analysis.

Species	General Habitat Description	Inclusion or Exclusion	Impact
TES			
Timber Wolf	Large, remote landscapes with wide variety of habitat types with adequate prey populations of mainly white-tailed deer	Included, minimal habitat	None
Bald Eagle	Nests in old-growth conifer (white pine) habitat with nests located within 660 feet of larger rivers or lakes.	Included, recorded obs/nesting.	None
Canada Lynx	Dense coniferous forest inhabited by snowshoe hare. Also frequent a variety of other habitats including shrub swamps, aspen, paper birch, northern hardwoods, upland openings, bogs, caves, and ledges and feed on alternate prey sources.	Excluded, no habitat.	None
American burying beetle	Mature climax forest ecosystems with deep litter, humus and soil layers, and lack of heavy understory provide the necessary conditions.	Excluded, no habitat.	None
Fassett's Locoweed	Open to partially shaded, sandy or gravelly shorelines of fluctuating shorelines (maintain open habitat) of alkaline lakes between the waterline and the tree line	Excluded, no habitat.	None
Karner blue butterfly	Natural sandy pine and oak barrens, pine prairies, oak savannas and along lakeshore dunes	Excluded, no habitat.	None
RFSS (Fauna)			
Northern Goshawk	Woodlands with intermediate canopy coverage interspersed with fields or wetlands. They prefer woodlands that consist of deciduous forests and northern maple-hemlock-pine stands that have interspersed canopy coverage with open areas for foraging.	Included, recorded obs/nesting.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Lake Sturgeon	Bottoms of large, clean warm water rivers and lakes. Inland populations prefer habitat in deep mid-river areas and pools where water depths vary between 12-30 feet and food is abundant.	Excluded, no habitat.	None
Le Conte's Sparrow	Moist grasslands, wet meadows, peripheries of wetlands, hay land, retired cropland, and native prairie.	Included, minimal habitat	None
Upland sandpiper	Large open grasslands, grasslands smaller than 30 ha. Optimum habitat is mixture of short grass areas and long grasses in areas larger than 150 acres. (RE 2002)	Included, minimal habitat.	None
Red-shouldered hawk	Bottomland hardwoods, mesic deciduous or mixed deciduous- conifer forests and wooded margins of marshes.	Included, recorded obs/nesting.	May impact individuals but not likely to cause a trend to federal listing or loss of viability

Species	General Habitat Description	Inclusion or Exclusion	Impact
Swainson's thrush	Mature upland mixed deciduous /conifer forest and lowland conifer forest. The most important habitat factor appears to be a dense conifer understory, for nesting cover. (RE 2002)	Included, suitable habitat.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Wood Turtle	Semi-aquatic along forested rivers and streams. Spends most of the summer on land, but does not venture far from the river.	Included, minimal habitat.	None
Trumpeter Swan	An interspersion of open water and emergent marsh habitat in isolated areas away from human disturbance.	Included, minimal habitat.	None
Cerulean warbler	Generally considered to be mature deciduous forest, often in mesic or floodplain situations, large habitat patches for successful breeding, nests near or adjacent to small canopy gaps or forest openings.	Included, recorded observation.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Spruce Grouse	Spruce bogs, jack pine, and upland spruce/fir areas, with a preference for relatively undisturbed spruce/cedar/tamarack swamps.	Included, minimal habitat.	None
Green-faced clubtail	Warm water, medium (>100'), fast streams with fairly clean gravel/sand substrate. Found closer to shore and in fast current areas of streams. Is not found in big rivers or trout streams.	Included, minimal habitat.	None
Henrys (frosted) Elfin	Pine barrens, edges of boggy areas, forest edges, openings, clearings, brushy areas and forest roads or trails.	Excluded, no habitat.	None
Northern blue butterfly	This butterfly requires open barrens conditions and is dependant on dwarf bilberry as a host plant, openings can be small	Included, confirmed observation.	
American (pine) marten	Pine martens live in mature, dense conifer forests. They prefer woods with northern white cedar, balsam fir, spruce and eastern hemlock, especially where trees have fallen (WDNR TES).	Included, minimal habitat.	None
Greater Redhorse	Clear waters of medium to large-sized rivers, reservoirs and large lakes at depths of less than 3 feet over sand, gravel or boulders.	Included, minimal habitat.	None
Northern (long-eared) myotis bat	Associated with forested communities, especially older age riparian and bottomland forests, uses small gaps and openings for foraging. Snags and loose-barked trees are important for summer roosting, especially in close proximity to water (RE 2000).	Excluded, no habitat.	None
Pugnose Shiner	Clear, weedy shoals of glacial lakes and streams of low gradient, over sand, mud, gravel, or marl. Associated with aquatic plants, including pondweed, water milfoil, elodea, eelgrass, coontail, bulrush, and filamentous algae.	Included, minimal habitat.	None

Species	General Habitat Description	Inclusion or Exclusion	Impact
Brown (Chryxus) arctic	Arctic and alpine tundra, open pine forest, open prairies, mountain meadows and sage flats (RE 2002).	Excluded, no habitat.	None
Extra-striped snaketail	Medium to large, free flowing, high water quality, moderate gradient warm water rivers. Particularly in riffle areas of gravel, sand, or cobble.	Included, minimal habitat.	None
Pygmy Snaketail	Medium to large, moderate gradient, free flowing rivers with good water quality.	Included, minimal habitat.	None
Connecticut Warbler	Predominately mature, lowland coniferous habitats (black spruce-tamarack bogs), and jack pine barrens with a thick shrub understory.	Included, recorded observation.	None
Tawny crescent spot	Populations have been found in northern part of WI, primarily in jack pine areas such as the Moquah Barrens in Bayfield County and Waubee Lake area in Oconto County.	Included, minimal habitat.	None
Black-backed woodpecker	Dense coniferous forests, especially in burned, swampy, cutover, or beetle-killed forests where dead trees are numerous.	Included, minimal habitat.	None
West Virginia white	Moist, shady, rich deciduous woods where toothwort, its larval host, can be found (RE 2002).	Included, suitable habitat.	None
Eastern pipistrelle	Partly open country with large trees, or woodland edges. Avoid deep woods and open fields. Presence of snags and hollow trees is important. Also, prefer hibernacula with stable moisture and temperature conditions (RE 2000)	Excluded, no habitat.	None
Bullhead mussel	Considered a large-river species, but also inhabits medium-sized rivers. Associated with riffles and gravel/cobble substrates but usually has been reported from deep water (>2 m) with slight to swift currents and mud, sand, or gravel bottoms (NS Web)	Excluded, no habitat.	None
Forcipate emerald	Habitat is bogs/acid peatlands or wetlands. Sphagnum is almost always present. species can't stand warm water temperatures – needs water cooled by shade or groundwater (RE 2000).	Excluded, no habitat.	None
Zebra Clubtail	Medium to large, moderate gradient, free flowing rivers with good water quality.	Included, minimal habitat.	None
Sharp-tailed Grouse	Large (2000-10,000 ac.) areas of open/brush upland or bog habitat. Mixed prairie and parklands, open woodlands, brushlands, scrub and grasslands.	Excluded, no habitat.	None
Ellipse mussel	Generally not found in large rivers. Habitat is small to medium streams with gravel or mixed sand and gravel, with good current (RE 2002).	Excluded, no habitat.	None
RFSS (Flora)			
Round-leaved orchis	Cold balsam fir-white cedar-black spruce swamps, usually with underlying layers of marl.	Excluded, minimal habitat.	None
Missouri rock cress	Typically found growing on dry-mesic soils with variable amounts of disturbance. It is often associated with bedrock glades and outcrops, bracken grassland, barrens, gravel bars, and other disturbance communities.	Included, recorded observation.	None
Green spleenwort	Found growing on moist, calcareous, limestone bedrock with dense bryophyte cover under full canopy shade.	Excluded, minimal habitat.	None

Species	General Habitat Description	Inclusion or Exclusion	Impact
Alpine milkvetch	Known from only one area in Wisconsin, is found on the Washburn Ranger District. It inhabits the sandy-gravelly shore of two neutral pH seepage lakes at about the high water mark.	Excluded, no habitat.	None
Mingan's moonwort	Grows in both open and shaded areas including meadows, lake and stream banks, and mixed hardwood forest.	Included, confirmed observation.	None
Goblin fern	Occurs under the full shade of northern hardwood forest dominated by sugar maple and basswood. Associated with a thick, spongy duff layer.	Included, confirmed observation.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Blunt-lobed grape-fern	Occurs in low, wet shady woods and swamps including the edges of woodland ephemeral ponds and transitional zones between upland and lowland forest.	Included, confirmed observation.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Ternate grape-fern	Found growing in open to semi-shaded areas in loamy-sand to sandy, acidic soils.	Excluded, minimal habitat.	None
Northern water-starwort	Found in shallow to deep waters of lakes and streams. On the Chequamegon-Nicolet, it has been found in a slightly alkaline flowage lake in <2 feet of water.	Excluded, no habitat.	None
Fairy slipper	Found growing in cool soils under old, undisturbed white cedar with full shade. It does not grow in soggy soils but rather prefers dryer islands within cedar swamps, often growing very close to the slightly raised areas surrounding cedar trunks.	Excluded, minimal habitat.	None
Large toothwort	Grows on extremely rich, silt-capped soils in mesic hardwood forests, often on flood plains.	Excluded, minimal habitat.	None
Assiniboine sedge	Occurs in rich, mesic hardwood forest including floodplains.	Included, suitable habitat.	None
Rocky Mountain Sedge	Found growing in cool sandy mixed woods, rock outcrops, and cliffs.	Included, suitable habitat.	None
Crawe's sedge	Grows on wet, sandy or mucky shores of calcareous lakes, and in wet meadows.	Excluded, no habitat.	None
Shore sedge	Found growing along wet sandy shores of Lake Superior and inland lakes and rivers.	Excluded, no habitat.	None
Livid sedge	Found in open bogs, calcareous fens, and peaty shores, often in sphagnum.	Excluded, no habitat.	None
Michaux's sedge	Typically found in Wisconsin growing in sphagnum bogs associated with Lake Superior.	Excluded, no habitat.	None
Many-headed sedge	Found growing on wet sandy or mucky shores of receding lakes or rivers.	Excluded, no habitat.	None
Sheathed sedge	Found growing in mossy white cedar and mixed conifer swamp.	Excluded, minimal habitat.	None
Spineless hornwort	Found in slightly acidic, soft-water lakes and slow moving streams as well as pools in bogs or marshes.	Excluded, no habitat.	None
Northern wild comfrey	Found growing on loamy-sand soils under sparse to moderate forest canopy of pine or pine mixed with red oak, paper birch and aspen, or in small natural forest openings.	Included, recorded observation.	None

Species	General Habitat Description	Inclusion or Exclusion	Impact
Ram's-head lady's-slipper	A plant of cool sub acid or neutral soils. On the Forest, it occurs in wet swamp conifer forest (mixed white cedar-balsam fir) and cool forest edges,	Included, minimal habitat.	None
Glade fern	A fern more closely associated with southern mesic forest south of the tension zone, has recently been found on the Medford unit of the Medford-Park Falls Ranger District. It grows on extremely rich, silt soils under the full shade of mesic hardwood forest.	Excluded, no habitat.	None
Fairy bells, Hooker's mandarin	It occurs under the full shade of upland mesic hemlock-hardwood forest in the western Upper Peninsula Michigan's Porcupine Mountains and Trap Hills.	Excluded, no habitat.	None
Spreading wood fern	Occurs under the full shade of mixed northern hardwood forest in the close proximity of exposed bedrock or talus, cool air drainage, and high moisture (running water, seeps, etc.).	Excluded, minimal habitat.	None
Male fern	Found in the Penokee-Gogebic Range of northern Wisconsin and western Upper Peninsula Michigan growing on dry, rocky, wooded slopes, often near the top of ridges.	Excluded, no habitat.	None
Fragrant fern	Typically found growing on shaded and open exposed bedrock cliffs or talus where there is cool airflow.	Excluded, minimal habitat.	None
Engelmann's spike-rush	Typically found on wet, mucky or sandy shores, peaty shores, exposed mud flats, and rarely bog mats.	Excluded, no habitat.	None
Capitate spike-rush	Found on sandy or muddy shores and bog mats surrounding lakes, usually in marly places, sometimes in several inches of water.	Excluded, no habitat.	None
Few-flowered spike-rush	Found on sandy or gravelly shores, and on bog mats surrounding lakes, usually in marly places and prefers a firm substrate.	Excluded, no habitat.	None
Marsh willow-herb	Found in open sphagnum bogs, edges of wet conifer swamp, and wet fen. This habitat is widespread and relatively undisturbed and is typically not directly impacted by management on the Forest.	Excluded, minimal habitat.	None
Marsh horsetail	Typically found growing along the wet edge of small streams, ponds, lakes and wetlands.	Excluded, minimal habitat.	None
Rusty cotton-grass	It typically is found growing in open, acidic bogs and is known from two sites on the Forest, both of which are on the Washburn Ranger District.	Excluded, no habitat.	None
Large-leaved avens	Typically found growing on dry-mesic, loamy sand soils along forest edges, in small openings, or along trails.	Excluded, no habitat.	None
Butternut	Found growing on rich, loamy, well-drained soils as well as on drier, rocky soils when associated with limestone.	Included, confirmed observation.	Beneficial
Moor rush	Found on rich, calcareous fens or bogs in full sunlight.	Excluded, no habitat.	None
Large-flowered ground-cherry	Typically occurs in open sandy, gravelly or rocky disturbed areas including floodplains, old beaver meadows, or areas recently burned. It will usually survive in a site two to three years after a disturbance and then disappear.	Excluded, no habitat.	None
American shore-grass	Small, perennial, aquatic plant that occurs in sandy or mucky lakeshores and open water to over 1 meter deep. Lakes are typically soft water, low pH with low nutrient and dissolved carbon levels.	Excluded, no habitat.	None

Species	General Habitat Description	Inclusion or Exclusion	Impact
Auricled twayblade	It is only found on raw, alluvial sand along creeks, rivers, and shoreline near the Great Lakes where it relies on cooler air and seasonal disturbance.	Excluded, no habitat.	None
Broad-leaved twayblade	Found growing near the base of steep slopes along swamp borders in seeps or in seepy ravines under hemlock-hardwood forest.	Excluded, no habitat.	None
White adder's-mouth	Inhabits cold, wet soils growing under mixed white cedar-balsam fir- black spruce, often at an ecotonal edge.	Excluded, minimal habitat.	None
Indian cucumber-root	Closely associated with the range of American beech (*Fagus grandifolia*) in Wisconsin. It prefers rich, mesic maple-beech forest with a full canopy although it is also found in wet woods including mixed swamp conifer and transitional zones.	Included, confirmed observation.	None
Large-leaved sandwort	Occurs mainly on dry, sheltered, rock outcrops, often in crevices under full to partial shade.	Excluded, no habitat.	None
Farwell's water-milfoil	Found in acidic ponds, lakes, and slow moving streams. It is known from several locations on the western portion of the Forest.	Excluded, no habitat.	None
American ginseng	Grows in rich loamy soils under the full shade of mixed northern hardwood forest often dominated by sugar maple and basswood.	Included, confirmed observation.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Marsh grass-of-parnassus	Circumboreal species that reaches its southeastern limit in Wisconsin and Michigan. It is found growing in calcareous fens and wet meadows, stream banks, shores, and near spring sources with moss ground cover.	Excluded, no habitat.	None
Arrow-leaved sweet colt's-foot	Early blooming member of the Aster family that is at the southern edge of its range in Wisconsin. Its habitat includes wet meadows, marshes, and shrub carr and often is found growing in several inches of water.	Excluded, no habitat.	None
Pale-green orchid	Primarily a southern plant that barely ranges north to the Chequamegon-Nicolet National Forest. Locally, it is known from open, moist prairie remnants along the Jump River in Taylor County just west of the Forest boundary and from a wet roadside in Ashland County (this population is no longer extant as of 2001). Elsewhere in its range, it is known from wet, swampy elm-ash, red maple, and white oak flatwoods where it grows near shallow pools in deep, matted leaf-litter.	Excluded, no habitat.	None
Canada mountain rice-grass	Found growing under the sparse canopy of jack pine or mixed pine forest on sandy soils. Often, these soils have moisture near the surface or the site is on a north-facing slope where moisture levels stay a little higher.	Excluded, no habitat.	None
Bog bluegrass	Typically found growing in wet, springy black ash swamp, mixed swamp conifer, and transitional zones, often in sphagnum or other moss.	Excluded, no habitat.	None
Western Jacob's-ladder	Grows in relatively open, rich mixed white cedar, tamarack, and black spruce swamps. Areas have a continuous carpet of moss and have neutral pH and water chemistry that suggests groundwater upwelling.	Excluded, no habitat.	None

Species	General Habitat Description	Inclusion or Exclusion	Impact
Braun's holly fern	Occurs under the full shade of mixed northern hardwood forest in the close proximity of exposed bedrock or talus and high moisture (running water, seeps, etc.).	Included, confirmed observation.	None
Algal-like pondweed	Found in acidic, often dark-stained bog ponds and lakes including slow areas of streams that feed or flow from them.	Excluded, minimal habitat.	None
Hill's pondweed	Known from one site in Wisconsin, is found on the Eagle River-Florence Ranger District. Its habitat includes clear, cold, calcareous streams and beaver ponds.	Excluded, no habitat.	None
Spotted pondweed	Found growing in shallow to deep water of acidic lakes and embayments on rivers.	Excluded, no habitat.	None
Giant pinedrops	Typically found on sandy soils under pine with thick pine duff.	Excluded, no habitat.	None
Lesser wintergreen	Found growing in cold soils under boreal-like forest (balsam fir-white cedar-spruce), transitional zones, and at the edge of alder thickets.	Excluded, no habitat.	None
Small yellow water-crowfoot	A circumboreal species that reaches its southern limit in Wisconsin. It is found growing in a variety of wet sites including edges of rivers, streams, lakes, and ponds (both in standing water and on banks), pools in bogs, and white cedar swamps.	Excluded, minimal habitat.	None
Lapland buttercup	A circumboreal species that barely reaches to the southern shore of Lake Superior and was only recently (late 1990's) found in Wisconsin. It typically inhabits cool, wet to wet-mesic white cedar forest.	Excluded, no habitat.	None
Brown beak-sedge	Found on sandy-peaty shores, marly fens, and less commonly on bog mats.	Excluded, no habitat.	None
White mandarin	Found growing in mesic, shaded forest. In Wisconsin, it is restricted to Bayfield and Ashland Counties and on the Forest is restricted to the Penokee-Gogebic Range in areas that naturally reduce or limit white-tailed deer herbivory (cliffs, talus, etc.).	Excluded, no habitat.	None
Heart-leaved foam flower	Found growing in deciduous or mixed forest, often in wet hollows or springy places. Wisconsin, at the western edge of foamflowers range, has three known sites including one on the Lakewood-Laona Ranger District.	Included, suitable habitat.	None
American elm	Found in swamp forests such as river floodplains and also in rich upland hardwoods, especially somewhat poorly drained areas.	Included, recorded observation.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Dwarf bilberry	Found in sandy and gravelly openings in dry pine-oak woodland and barrens, sandy old-field swales, and in rock crevices near rivers.	Included, confirmed observation.	None
Marsh valerian	Found in wet, calcareous, open white cedar woodland and fen habitats, often underlain with limestone and with groundwater upwelling.	Excluded, no habitat.	None

Table D-3. MIS general habitat description and rational for inclusion or exclusion of EIS analysis.

MIS	Habitat Type	Inclusion or Exclusion
Bald Eagle	Nests in old-growth conifer (white pine) habitat with nests located within 660 feet of larger rivers or lakes.	Excluded, selected for analysis in Effect Analysis to TES.
Barred Owl	Large cavity trees: mixed northern hardwoods with available cavities	Included, record of observation and suitable habitat.
Beaver	Streams, lakes associated mainly with aspen and other deciduous trees	Excluded, riparian aspen habitat not affected. Aspen habitat analyzed with ruffed grouse.
Black-backed Woodpecker	Dense coniferous forests, especially in burned, swampy, cutover, or beetle-killed forests where dead trees are numerous.	Excluded, however selected for analysis in BE.
Black-burnian Warbler	Primarily upland conifer (hemlock) but also lowland conifer and hemlock inclusion in hardwoods or mixed forest habitat	Included, record of observation and suitable habitat.
Black-throated Green Warbler	Mixed upland conifer, but also lowland conifer and hemlock inclusions in hardwood.	Included, record of observation and suitable habitat.
Bobcat	Lowland/swamp conifer forest in areas of low human disturbance and low road density.	Excluded, habitat not affected.
Brook Trout	Cold water streams and lakes.	Included, record of observation and suitable habitat.
Chestnut-sided warbler	Regenerating deciduous (aspen) and hardwoods	Included, record of observation and suitable habitat.
Common Loon	Secluded lakes > 20 acres (clear to light brown)	Excluded, habitat not affected.
Common Raven	Mature/ old growth softwoods and occasionally uneven aged deciduous forest.	Excluded, habitat not affected;
Eastern Gray Squirrel	Oak and mixed oak/pine forest	Excluded, minimal changes to oak habitats in all Alternatives (4 stands, select cut)
Lincolns Sparrow	The 1986 Nicolet LRMP Forest Plan identified the Lincoln's sparrow habitat as 0-10 year old regenerating upland softwood forest, however, NNBBS data indicates that this species is more typically found in lowland conifer bog.	Excluded, habitat not affected and no records in MPA.
Ovenbird	Long rotation, old growth, mature, and uneven aged deciduous forest.	Included, record of observation and suitable habitat.
Pileated Woodpecker	Large snag trees; swamp conifer and north. hardwoods	Included, record of observation and suitable habitat.
Pine Warbler	Primarily mature upland conifer; red, jack and white pine forest	Included, record of observation and suitable habitat.
Red-eyed vireo	Hardwood and aspen forests	Included, record of observation and suitable habitat.
Ruffed Grouse	Aspen and mixed forest types; mostly younger age classes	Included, record of observation and suitable habitat.
Scarlet Tanager	Mature deciduous forests	Included, record of observation and suitable habitat.
Thirteen-lined Ground Squirrel	Small upland openings	Excluded, habitat not affected.

White-tailed deer	Areas interspersed with fields, woodland openings, aspen and regenerating hardwood and conifer forest, dense conifer swamps (seasonally)	Included, record of observation and suitable habitat.
Wood Duck	Forest riparian habitat: natural/artificial cavities	Excluded, habitat not affected.

TableD-4. Summary of determination of impacts to RFSS.

Species	No Impact	Beneficial Impact	May impact individuals but not likely to cause a trend to Federal listing or loss of viability	May impact individuals and likely to result in a trend to Federal listing or loss of viability
Animal Species				
Northern goshawk		X	X	
Lake sturgeon	X			
LeConte's sparrow	X			
Upland sandpiper	X			
Red-shouldered hawk		X	X	
Swainson's thrush		X	X	
Black tern	X			
Wood turtle	X			
Trumpeter swan	X			
Cerulean warbler		X	X	
Spruce grouse	X			
Green-faces clubtail	X			
Henry's elfin butterfly	X			
Northern blue butterfly		X		
American (pine) marten	X			
Greater redhorse	X			
Northern (long-eared) myotis	X			
Pugnose shiner	X			
Brown (chryxus) arctic	X			
Extra-striped snaketail	X			
Pygmy snaketail	X			
Connecticut warbler	X			
Tawny crescent spot		X		
Black-backed woodpecker	X			
West Virginia white	X			
Eastern pipistrelle bat	X			
Bullhead mussel	X			
Forcipate emerald	X			
Zebra clubtail	X			
Sharp-tailed grouse	X			
Ellipse mussel	X			
Plants				
Round-leaved orchis	X			
Missouri rock cress	X			
Green spleenwort	X			

Species	No Impact	Beneficial Impact	May impact individuals but not likely to cause a trend to Federal listing or loss of viability	May impact individuals and likely to result in a trend to Federal listing or loss of viability
Alpine milkvetch	X			
Mingan's moonwort	X			
Goblin fern			X	
Blunt-lobed grape-fern			X	
Ternate grape-fern	X			
Northern water-starwort	X			
Fairy slipper	X			
Large toothwort	X			
Assiniboine sedge	X			
Rocky Mountain Sedge	X			
Crawe's sedge	X			
Northern bog sedge	X			
Shore sedge	X			
Livid sedge	X			
Michaux's sedge	X			
Many-headed sedge	X			
Sheathed sedge	X			
Spineless hornwort	X			
Northern wild comfrey	X			
Ram's-head lady's-slipper	X			
Glade fern	X			
Fairy bells, Hooker's mandarin	X			
Spreading wood fern	X			
Male fern	X			
Fragrant fern	X			
Engelmann's spike-rush	X			
Capitate spike-rush	X			
Few-flowered spike-rush	X			
Marsh willow-herb	X			
Marsh horsetail	X			
Rusty cotton-grass	X			
Large-leaved avens	X			
Butternut		X		
Moor rush	X			
Large-flowered ground-cherry	X			
American shore-grass	X			
Auricled twayblade	X			

Species	No Impact	Beneficial Impact	May impact individuals but not likely to cause a trend to Federal listing or loss of viability	May impact individuals and likely to result in a trend to Federal listing or loss of viability
Broad-leaved twayblade	X			
White adder's-mouth	X			
Indian cucumber-root	X			
Large-leaved sandwort	X			
Farwell's water-milfoil	X			
Canada mountain rice-grass	X			
American ginseng			X	
Marsh grass-of-parnassus	X			
Arrow-leaved sweet colt's-foot	X			
Pale-green orchid	X			
Bog bluegrass	X			
Western Jacob's-ladder	X			
Braun's holly fern	X			
Algal-like pondweed	X			
Hill's pondweed	X			
Spotted pondweed	X			
Giant pinedrops	X			
Lesser wintergreen	X			
Small yellow water-crowfoot	X			
Lapland buttercup	X			
Brown beak-sedge	X			
White mandarin	X			
Heart-leaved foam flower	X			
American elm	X			
Dwarf bilberry		X		
Marsh valerian	X			

BIOLOGICAL EVALUATION

FOR THE

McCASLIN ENVIRONMENTAL IMPACT STATEMENT

Chequamegon-Nicolet National Forest
Lakewood – Laona Ranger District

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1 INTRODUCTION

The purpose of biological evaluations and assessments (BE/s, BA/s) are to "review all USDA Forest Service (FS) planned, funded, and executed, or permitted programs and activities for possible effects on endangered, threatened, proposed, or sensitive species" (FSM 2672.4). "Endangered (E)", "threatened (T)", and "proposed (P)" refer to those species covered by the Federal Endangered Species Act (19 USC 1536(c), 50 CFR 402.12(f) and 402.14(c)) and listed by the USDI Fish and Wildlife Service (FWS) or National Marine Fisheries Service. "Sensitive" species include "those plant and animal species identified by a Regional Forester for which population viability is a concern" (FSM 2670.5). The FS is responsible for protecting all federally proposed and listed species and the Regional Forester's Sensitive species (RFSS). In addition, the FS is directed to "assist states in achieving their goals for conservation of endemic species" (FSM 2670.32). State listed species are addressed in the project environmental impact statement when they are known to occur within a project area or are likely to be impacted by the activities of a project. Protection measures for State listed species will be undertaken where feasible. For more information on species status, species considered, requirements, management guidelines, and bibliography used to complete this site-specific BE reference the 2001 BE Reference Document.

Scott Anderson, Wildlife Biologist, and Steve Janke, Plant Ecologist, with the Chequamegon-Nicolet National Forest (CNNF), Lakewood/Laona Ranger District, (La/La RD) were principle authors of this document. The information contained in this BE was based on district and forest wildlife records, literature review, contact with other professionals knowledgeable of species habitat requirements and personal observations.

2 LOCATION OF PROJECT AREA

The McCaslin Project Area (MPA) is located immediately north of Lakewood, Wisconsin, within Oconto and Forest County. The project area is about 36,000 acres in size with a majority of the area in National Forest System lands (approx. 21,000 acres). The legal description of the area is: Township 33 North, Range 15 East, sections 1-3, 11-14, and 24-5; Township 33 North, Range 16 East, sections 1-11, 14-23, 27-30; Township 33 North, Range 17 East, sections 5 and 6; and Township 34 North, Range 16 East, sections 16, 17, 20-29; 32-36.

The lands that make up the project area were created largely by glacial actions during the last Ice Age. The topography ranges from flat to rolling terrain that is dominated by landforms such as moraines and outwash plains. The northern portion of the project area is typified by finer-textured loamy soils that support high-quality northern hardwoods mixed with aspen and early successional conifers, such as spruce. The southern portion of the project area is typified by sandier-textured soils that support pine, aspen, and mixed hardwoods. The North Branch of the Oconto River runs through the center of the project area, on an east-west course and there are numerous streams that also run through the area and empty into the Oconto River. In addition, a number of lakes are located within the project area and because of these features, it is a popular recreation area for camping, hunting, fishing, and sightseeing.

3 CONSULTATION WITH OTHER AGENCIES

Information regarding proposed, threatened, endangered and plants and animals within the MPA was obtained through the cooperation of the U.S. Fish and Wildlife Service (FWS) and Wisconsin Department of Natural Resources (WDNR) - Bureau of Endangered Resources (BER). The FWS response letter (May 01, 2001) indicated that the bald eagle (*Haliaeetus leucocephalus*), gray wolf (*Canis lupus*), karner blue butterfly (*Lycaeides melissa samuelis*) and Canada lynx (*Lynx Canadensis*) are federally listed threatened or endangered species that occur or have potential habitat within Oconto and/or Forest County. The WDNR- BER species of concern list (May 07, 2001) included species for which they have Natural Heritage Database records in or around MPA. These species are analyzed within the RFSS section of the BE.

4 BACKGROUND

The forest found in the project area today is a direct result of the passage of time and active management through the years (Table 1). Like most areas on the CNNF, the project area was extensively logged in the late 1800's and early 1900's before the establishment of the National Forests in the early 1930's. Aerial photographs of the project area, taken in 1938, depict an entire landscape dominated by brush fields that resulted from this Era of Exploitation. A new chapter began in the 1930's when these lands were organized into what is now known as the CNNF. The

Civilian Conservation Corps, local citizens, and personnel from the USDA-Forest Service worked together to replant and tend the newly established forest.

Table 1. Forest types in the McCaslin Project Area.

Forest Type	Acres [1]	Percent
Red Pine	869.8	3.9
White Pine	871.6	3.9
Hemlock	6.0	-
Balsam Fir - Aspen	321	1.4
Northern white Cedar	123	0.6
Tamarack	76.2	0.3
White Spruce-Balsam Fir-Aspen	641	2.9
Upland Back Spruce	30	0.1
Mixed Swamp Conifer	576.3	2.6
Northern Red Oak	1,458.8	6.6
Black Ash-American Elm-Red Maple	314.6	1.4
Mixed Lowland Hardwood	96.7	0.4
Sugar Maple-Yellow Birch	156.8	0.7
Sugar Maple-Basswood	4,814.9	21.7
Mixed Northern Hardwoods	1,714.7	7.7
Quacking Aspen	6,461	29.2
Aspen-White Spruce-Balsam Fir	664.9	3.0
Non-forested Lowland	1,680.6	7.6
Non-forested Upland	327.5	1.5
Totals	22,153.6	100

[1] National Forest Lands only

During the subsequent 70 years, the Forest Service conducted numerous activities designed to encourage the growth and development of the forest and to create a mix of forest types and ages that are favorable to a variety of wildlife species. Commercial timber harvests, pre-commercial thinning, and tree planting have been the primary methods to achieve these objectives.

Available records indicate that a variety of timber harvests were conducted in the mid 1970's and again in the mid n thinning longer-lived forest types, such as maple and red pine, and on regenerating shorter-lived forest types, such as aspen and jack pine. The last time the project area was comprehensively analyzed was in 1990 (McCaslin Opportunity Area (OA)) and 1991 (Virgin Island OA). Subsequent Environmental Assessments (EA) were developed from the information collected in those comprehensive analyses to analyze management projects (Moraine, 1990- McCaslin OA; Foxtail, 1991- northeast portion of Virgin Island OA; and Shamrock, 1991- southwest portion of Virgin Island OA). Projects from these EA's were subsequently implemented between 1992 and 1997. The projects implemented included road construction, road closure, timber harvesting, wildlife opening maintenance, prescribed burning, and other wildlife habitat improvement. Other management projects conducted in the vicinity in recent years include the South Otter project (1992- north west of the project area) and the Thunder Springs EA (1997- southeast of the project area). These adjacent projects included similar actions to those listed above.

5 DESCRIPTION OF ALTERNATIVES

The purpose of the McCaslin Project is to implement land management activities that are consistent with direction in the Nicolet Forest Plan (NFP). The NFP allocated the majority of the lands within the MPA to Management Areas 1.1, 1.2, 3.1, 3.2 and 4.2. These allocations identified desired future conditions and gave general management direction for each of the management areas. Analysis of the MPA, represented by the McCaslin Mountain and

Virgin Island OA's, indicated that the following conditions warranted action to accomplish the direction and desired conditions identified in the NFP. Specifically, the following needs for action have been identified:

- There is a need for modified composition, density, and age distributions of forest stands that move the area toward the desired future conditions identified in the NFP and the McCaslin Mountain and Virgin Island OA Analyses. The density of trees in hardwood and conifer stands in the area is higher than that called for in the NFP. The high density of trees is suppressing the growth rate of trees, limiting their value from ecological and economic standpoints.

- There is a need to control the competition of vegetation around certain young plantations within the project area. Following the last analysis of the project area, a number of areas were planted with seedlings or regenerated through natural seeding or sprouting. In some of the areas, brushy species have since taken root and are competing with the desired seedlings.

- There is a need to encourage the regeneration of eastern hemlock and American butternut. The NFP has identified the need for a higher representation of hemlock (NFP pp. 89, 105, 113) and it has been a Forest policy to encourage its establishment where opportunities are present. American butternut is currently being attacked nationwide by a very virulent exotic fungus called butternut canker that has decimated butternut populations. American butternut is a minor timber species in the eastern United States, with an unusually high presence within the State of Wisconsin. In particular, the part of the state in which the project area is located has a relatively high representation of this species.

- There is a need to increase the white pine component in the project area. The NFP (pp. 89, 105, 113) gives desired future conditions (DFC's) for vegetation composition in each of the management areas. Preliminary analysis shows that the amount of existing white pine is less than these DFC's throughout the MPA.

- There is a need to improve access to some areas that have an inadequate road system to facilitate harvesting and hauling operations. There is also a need to identify roads that are not needed for future use and to designate them for closure, abandonment, or obliteration.

- There is a need to provide for a diverse range of plant and animal communities based on the suitability and capability of the specific land area. There is also a need to increase the percentage of forest in the young age classes to maintain and improve habitat for game wildlife species. In addition, there is a need to provide habitat for non-game wildlife, threatened and endangered plants and animals, and species of concern.

In response to the identified needs, the FS is proposing to implement an array of land management activities that are consistent with existing management direction and that respond to the needs for action stated above. The McCaslin Project would provide opportunities to harvest timber (primarily sugar maple-basswood, mixed northern hardwoods, aspen, white and red pine) and improve area transportation systems, wildlife habitat, and biological diversity. This would be accomplished by conducting one of the following summarized alternatives. (Table 2-5)

5.1 ALTERNATIVE 1 - NO ACTION

This alternative was developed in response to National Environmental Policy Act (NEPA) requirements and serves as a baseline against which all other alternatives are evaluated. The following proposed activities would not occur in the MPA; timber harvest, site preparation, constructed/re-constructed roads and log landings, prescribed burns or under burns. The No Action Alternative proposes that ecological processes control vegetative development and that all stands would continue to grow and mature. Some trees will die from forces related to size, competition, or age stress. These species would than be replaced by other or more shade-tolerant individuals and over time, the stands will begin to resemble the climax vegetation type. Annual maintenance of roads, trails, wildlife openings and recreational facilities would continue to occur.

5.2 ALTERNATIVE 2 - PROPOSED ACTION

Based on the opportunities and needs outlined in the Purpose and need for Action Section, the Forest Service proposes the following actions in the McCaslin Project Area.

Table 2. Alternative 2

Stand Type	CC	OR	Sel	SW	Thin	Total
Jack Pine	110	16	0	0	0	126
Red Pine	0	0	0	0	625	625
White Pine	0	0	0	0	755	755
Balsam fir-Aspen-Birch	47	0	10	13	0	70
White Spruce	0	32	0	0	322	354
Northern Red Oak	0	0	0	0	149	149
Sugar Maple-Basswood	6	0	3873	0	82	3961
Mixed Hardwoods	0	0	732	0	467	1199
Aspen	792	25	16	15	73	921
Paper Birch	55	0	0	0	98	153
Aspen-white spruce- balsam fir	90	158	0	0	41	289
Maple-y. birch	0	0	55	0	0	55
Eastern-hemlock	0	0	0	0	33	33
Total	1100	231	4686	28	2645	8690

CC= clearcut, OR= overstory removal, Sel=selection harvest, SW=selterwood harvest, Thin=thinning harvest.

There would also be approximately 240 acres of underplanting with white pine, hemlock, white spruce or fruit shrubs; 135 acres of butternut regeneration, 175 acres of prescribed burns of underburns, and 315 acres of timber release involving aspen, mixed northern hardwoods, aspen-white spruce-balsam fir, paper birch, white, jack and red pine.

5.3 ALTERNATIVE 3.

This alternative emphasis is with Interior Habitat.

Table 3. Interior Alternative.

Stand Type	CC	OR	Sel	SW	Thin	Total
Red Pine	0	0	0	0	599	599
White Pine	0	0	0	0	754	754
Balsam fir-Aspen-Birch	0	0	0	16	0	16
White spruce -balsam fir-aspen	0	0	0	0	267	267
Northern red oak	0	0	0	0	109	109
Sugar Maple-Basswood	0	0	3825	0	0	3825
Mixed Northern Hardwoods	0	0	1112	0	0	1112
Aspen	0	0	53	0	182	235
Total	0	0	4990	16	1911	6917

CC= clearcut, OR= overstory removal, Sel=selection harvest, SW=selterwood harvest, Thin=thinning harvest.

There would also be approximately 295 acres of underplanting with white pine, hemlock, white spruce or fruit shrubs; 135 acres of butternut regeneration, 20 acres of prescribed burns of underburns, and 315 acres of timber release involving aspen, mixed northern hardwoods, aspen-white spruce-balsam fir, paper birch, white, jack and red pine.

5.4 ALTERNATIVE 4

This alternative emphasis is with aspen management.

Table 4. Alternative 4

Stand Type	CC	OR	Sel	SW	Thin	Total
Jack pine	110	0	0	16	0	126
Red Pine	0	0	0	0	621	621
White Pine	14	0	0	0	740	754
Balsam fir-Aspen-Birch	42	0	0	10	0	52
White spruce -balsam fir-aspen	31	32	0	25	266	354
Northern red oak	0	0	0	18	149	167
Sugar maple-yellow birch	0	0	55	0	0	55
Sugar Maple-Basswood	285	0	3383	0	318	3986
Mixed Hardwoods	368	0	339	0	428	1135
Aspen	1014	25	0	0	0	1039
Paper birch	52	0	0	0	0	52
BT Aspen	184	0	0	0	0	184
Aspen-wht spruce-balsam fir	162	158	0	0	0	320
Total	2262	215	3777	69	2522	8845

CC= clearcut, OR= overstory removal, Sel=selection harvest, SW=selterwood harvest, Thin=thinning harvest.

There would also be approximately 165 acres of underplanting with white pine, hemlock, white spruce or fruit shrubs; 85 acres of butternut regeneration, 175 acres of prescribed burns of underburns, and 315 acres of timber release involving aspen, mixed northern hardwoods, aspen-white spruce-balsam fir, paper birch, white, jack and red pine.

5.5 Alternative 5

This alternatives emphasis is a hybrid between the Interior and Aspen alternatives.

Table 5. Alternative 5

Stand Type	CC	OR	Sel	SW	Thin	Total
Jack pine	97	0	0	28	0	125
Red Pine	0	0	0	0	621	621
White Pine	0	0	0	0	754	754
Balsam fir-Aspen-Birch	0	0	10	13	0	23
White spruce -balsam fir-aspen	0	32	0	0	316	348
Northern red oak	0	0	0	0	149	149
Sugar maple-yellow birch	0	0	55	0	0	55
Sugar Maple-Basswood	0	0	3906	0	75	3981
Mixed Hardwoods	0	0	660	0	496	1156
Aspen	277	19	76	0	469	841
Paper birch	52	0	0	0	25	77
BT Aspen	98	0	0	0	28	126
Aspen-white spruce-balsam fir	72	66	0	0	161	299
Total	596	117	4707	41	3094	8555

CC= clearcut, OR= overstory removal, Sel=selection harvest, SW=selterwood harvest, Thin=thinning harvest.

There would also be approximately 285 acres of underplanting with white pine, hemlock, white spruce or fruit shrubs; 135 acres of butternut regeneration, 175 acres of prescribed burns of underburns, and 315 acres of timber release involving aspen, mixed northern hardwoods, aspen-white spruce-balsam fir, paper birch, white, jack and red pine.

6 ANALYSIS OF EFFECTS

Direct, indirect and cumulative effects analysis for RFSS was conducted within and approximately 2 miles outside the MPA. This scale is large enough to address habitat and movement concerns for species that use relatively large home ranges. It was also selected because it includes the scale at which vegetation analysis was evaluated and most of the potential impacts to wildlife come from vegetation management. The term "direct effects" will relate to effects that impact individual animals or populations; the term "indirect effects" will be used to describe effects that impact habitat or habitat conditions, resulting in potential impacts to animals or populations requiring those habitats. The phrase "short term" will relate to the time period within fifteen years of project implementation. The phrase "long term" will relate to a time period greater than fifteen years from project implementation. The practices of hardwood thinning, improvement, and selection harvest will be considered together in this analysis as selection cutting, since their effects on vegetation and stand structure are essentially the same.

A likelihood of occurrence (LHO) was completed for each RFSS species (Appendix A1) to determine the level of analysis. LHO was determined by looking at occurrence history within the project area and compared existing habitat conditions to the species habitat requirements. A species was rated as confirmed when preferred habitat was present, a documented occurrence is on file from within or near the project area; probable when habitat is suitable, species has been documented on the Forest but not necessarily within project area, or minimal when some habitat exists, species may or may not have been documented on Forest or none when the species may occur within the region, but has no recent record of occurrence on the La/La RD, and/or habitat within the project area does not exist or is not suitable. Determination of LHO also utilized district RFSS files, records of the WDNR, Natural Heritage Inventory; available research literature; survey data; and personal communication with relevant RFSS specialists. Species that occur and had a high possibly of occurring within the project area were brought forward to effects analysis and those determined unlikely were not analyzed.

7 REGIONAL FORESTER'S SENSITIVE SPECIES AND ASSESSMEMNT OF EFFECTS

The FS Manual (FSM 2670.15) defines sensitive species as "those plants and animal species identified by a Regional Forester for which population viability is a concern as evidenced by significant current or predicted downward trend in numbers and density" and "habitat capability that would reduce a species existing distribution." Forest Plans must provide for sufficient fish and wildlife habitat to maintain viable populations of existing native vertebrate species well distributed throughout the planning area over time (36CFR 219.27(a)(6), 1982). In addition, the USDA Departmental Regulation 9500-4 requires that habitats for all existing native and desired non-native plants, fish, and wildlife species will be managed to maintain at least viable populations of such species.

The Eastern RFSS list was first issued on March 8, 1994 and updated on February 29, 2000. Species analyzed for this project are the February 2000 list along with those species the CNNF approved through the RFSS Update Process in April 2002 that is outlined in FSM Chapter 2670, R9 Supplement 2600-2000-1. Risk evaluations were completed for each species considered for new listing and these evaluations were incorporated into this analysis. This RFSS list includes 66 plants, 13 birds, 5 fish, 4 butterflies, 4 dragonflies, 2 mussels, 1 mammal, and 1 reptile. A description of these species habitats and populations are analyzed and a summary is presented in Appendix A (Table A1, Table A2 and Table A3). All these species were considered, and only those known to occur in the project area, or have the potential to occur (potential habitat exists within the project area), were evaluated for effects from the proposed management activities.

7.1 RFSS WILDLIFE

7.1.1 Northern Goshawk (*Accipiter gentiles*)

The northern goshawk is a large, forest-dwelling raptor generally associated with mature deciduous, conifer, or mixed forest (Boal, et al 2001). These forest types of the northern portions of Michigan, Minnesota, and Wisconsin and the southern portions of Ontario are the southern most extent of its current breeding range (Kennedy and Anderson, 2001). In Wisconsin, they were considered a rare summer resident until at least the middle of the 19th century. By 1900, most of the climax forests of mixed northern hardwoods had been logged and repeatedly burned and the birds probably persisted in the unharvested areas (Erdman et al 1998). Currently, it is an uncommon resident in the north and an uncommon migrant in the central and southern parts of the state. However, exceptional numbers of birds may occur approximately every 8-10 years when ruffed grouse and snowshoe hare populations are low in its northern range (Robbins 1991).

The goshawk is morphologically well adapted for life in forested lands and is considered a habitat generalist as it occupies most of the forested types in its range. Specific nesting habitat information is limited for eastern populations due to a lack of studies that examine nest site placement in the context of available habitat features. Summary of western data indicated that goshawks tend to select stands with relatively large trees and high canopy closure (Kennedy and Anderson, 2001). Rosenfield's (1998) supported this conclusion as his mean nest-tree height was 25 m, tree dbh was 41 cm and canopy closure was 82%. It also reported that goshawks are flexible in the vegetation types used for nest sites as they used pine plantations, maple and maple-oak uplands, black ash swamps, aspen monotypes within forest fragments. A number of studies indicate that nests maybe located near natural or man-made openings in the overstory as they provide travel corridors, reduce flight barriers for fledglings and increase prey diversity (PVA, 2000). Goshawks are an active and opportunistic hunter that take large prey, including snowshoe hares, ruffed grouse, larger songbirds, squirrels and other species that occupy the ground-shrub zone (PVA, 2000). Snags, downed logs, openings, large trees, shrubby understories, and interspersion of vegetation structural stages (grasses to old forests) are critical for prey species used by the goshawk.

For this analysis, potential nesting goshawk habitat was identified as mature hardwood, pine, aspen, and mixed forest. However, only a subset of these habitats would actually provide the site conditions necessary for goshawk nesting (PVA, 2000). It is not understood whether these habitat conditions must be present throughout the nest stand or only around the nest site. In both natural and managed stands, canopy closure, tree density, and tree size can be quite variable. Therefore, it was difficult to identify specifically which of the mature stands in the project area provide truly suitable nesting habitat. An attempt was made to identify the best potential goshawk habitat by querying FS stand information in a Geographical Information System (GIS). Pre-screening of potential habitat was done using criteria established by Forest biologists, and included factors such as stand age, type, and structure. There are approximately 6,000 to 6,700 acres of potential goshawk habitat with proposed harvest treatments depending on Alternative. This habitat is scattered in the southern portion and is in larger continuous blocks in the northern part of the MPA. Some of the queried stands were eliminated from analysis due to small stand size, no adjacent suitable habitat and adjacent fragmented landscape. Call-back surveys for goshawks will be conducted between March 15 and April 15 by FS biologist, FS trained raptor surveyors and/or contracted raptor surveyors. Some of these stands will be ground surveyed to verify if they contained terrestrial features that would qualify them as potential survey stands. Historical nesting territories were obtained from T. Erdman, Goshawk Biologist, who has been conducting research in this area for the past 30 years. Due to the sensitivity of goshawk nest sites, their locations will not be given in this document. Three known records of goshawk nests are within the MPA; two with proposed harvest activities nest timber stand. Surveys conducted at these sites in spring 2002 indicated activity at one but no nest was located. The other locations had neither activity nor nest observed. Forest Plan Standard and Guidelines for goshawks would be followed to prevent disturbance to nesting birds or alteration of adjacent habitat at all nest sites (USFS, 1986).

In general, the proposed harvest activities can have detrimental effects on goshawk nesting territories (abandonment of the nest) if standards and guidelines are not implemented. The greatest impact is from the harvest of a stand containing the nest and road wok directly adjacent to the nest. There would be direct effects if any activities within the territory occurred during the nesting or brood-rearing season of mid-February to early August. Excess disturbance can cause birds to leave their nests long enough for eggs or young to be susceptible to exposure or predation. There could also be indirect effects due to timber harvest within the bird's territory that changes the quality of the nesting habitat. The birds may avoid setting up a nesting territory because of the disturbance within an otherwise suitable nesting area.

Alternative 1

No changes to the landscape would occur due to management and goshawk habitat would remain mostly unchanged. Hardwoods and mixed forest that currently provided suitable habitat would continue to do so as they are not substantially impacted by succession. Mature aspen stands that provide nesting habitat, would gradually move toward hardwood or conifer conditions. During that transition period some habitat may be lost because of a decrease in canopy closure. Habitat for goshawk prey species (grouse and snowshoe hare) would only change through natural succession. Aspen and mixed forest would convert to other less suitable prey habitat types and this could result in a decline in their populations in the long-term. This change would be gradual and would allow goshawks an opportunity to adapt, select other prey species, and move if necessary. Potential impacts to goshawks would be indirect and negligible.

Alternative 2

This alternative includes about 4,650 acres (1,600 acres high potential habitat) of selection harvest in potential goshawk habitat. This treatment would remove individual trees of all sizes to reduce competition and allow for increased growth in remaining trees making them more desirable nesting sites. Habitat suitability and forest continuity would be minimally affected because canopy closure would remain high ($\geq$75%) after the harvest. Foraging opportunities are also improved by keeping the understory open by maintaining a mostly closed canopy. There would be 600 acres of potential hardwood habitat (100 acres high potential habitat) treated with thinning harvest methods. Thinning treatments can open the stand's canopy and make them unsuitable nesting habitat for several years. The open canopy also makes suitable nesting habitat for Great horned owls and red-tailed hawks that are predators of goshawks. Once the canopy closes in and larger diameter trees develop to improve stand structure, the stands would return to suitable goshawk habitat. Red and white pine thinnings would occur in about 800 acres of mature timber stands that could have the proper stand structure for nesting. This habitat is not typically used for nesting but the La/La RD does have records of successful nesting in these timber types. Effects would be similar to hardwood thinnings with lesser possibilities of owls and hawks predating because these birds do not prefer this habitat. These pine thinning acres and stands are repeated in all other action alternatives and effects would be the same. About 600 acres (300 acres high potential habitat) of aspen clearcutting will occur in potential goshawk habitat. This could remove potential nesting habitat for several decades. However, there would remain about 430 acres of potential nesting habitat (130 acres high potential) in mature aspen (> 40 years old). Immediately after harvest, these stands would not provide useful resource for goshawks. But after several growing seasons they would support high densities of grouse and hare habitat that would provide excellent hunting grounds. These clearcuts would also have residual trees that goshawks would be able to use as perches to scan for prey in the openings. There are 73 acres of overstory removal (0 acres high potential habitat) and 15 acres of shelterwood (15 acres high potential habitat) harvest treatments proposed in potential goshawk habitat. Both of these treatments would reduce stand canopy closure under 70% and thus make them unsuitable for nesting but could be used for hunting areas.
All regeneration and tree release projects occur in stands that have harvest treatments and effects of prep work for these projects would be the same as the harvest treatments. The tree release activities would occur in immature stands and therefore would not affect nesting habitat. Along with the underplanting activities, they would provide for potential nesting habitat to develop in the long term. Habitat for prey species would remain intact for short-term period in the release stands, but would gradually be replaced in the future with an open understory as the stand matures. Prey base populations would be maintained in the area due to other early successional habitat being created. The prescribed burn and wildlife opening maintenance work does not take place in goshawk nesting habitat but would help provide habitat for prey species.
There would be limited road construction within suitable nesting habitat for goshawks because most roads needed for harvest already exist (Table 6).

Table 6. Road activity within high or medium potential goshawk habitat.

	Alternative 2			Alternative 3			Alternative 4			Alternative 5		
	GOSH Habitat			GOSH Habitat			GOSH Habitat			GOSH Habitat		
	High	Med	Total	High	Med	Total	High	Med	Total	High	Med	Total
Con-C	0.86	0.39	1.25	0.00	0.00	0.00	0.86	0.36	1.22	0.08	0.05	0.13
Con-D	0.20	0.31	0.51	0.00	0.00	0.00	0.14	0.31	0.45	0.41	0.67	1.08
Decom.	5.86	5.54	11.40	7.09	8.17	15.26	7.13	6.96	14.09	6.57	7.64	14.21
Recon-C	2.06	8.04	10.10	0.00	0.26	0.26	1.10	5.86	6.96	0.00	1.39	1.39
Recon-D	0.38	0.97	1.35	0.38	0.93	1.31	0.38	1.32	1.70	0.95	3.12	4.07
Maintain	1.35	5.74	7.09	3.42	13.50	16.92	2.32	7.39	9.71	3.42	10.22	13.64
Drop	0.00	0.00	0.00	1.06	1.47	2.53	0.06	0.00	0.06	0.65	0.00	0.65
Total	10.71	20.99	31.70	11.95	24.33	36.28	11.99	22.20	34.19	12.08	23.09	35.17

Decommissioning roads would reduce traffic and thus possible disturbance to goshawks. The amount of roads being reconstructed is the most of all alternatives. This amount and activity would not directly alter these stands potential in the long term as suitable habitat for nesting or foraging sites. Indirectly the roadwork could cause longer-term effects by increasing human use of the area and possibly disturbing nesting birds. However, disturbance during the critical nest-building period would be minimal because this time of year roads are in poor condition and not frequently traveled. In all, this alternative would reduce the open road density in suitable nesting habitat. Only a small amount of goshawk habitat would be impacted by road construction and potential disturbance after harvest. Roads built to access harvest stands would be closed to passenger vehicles and ATV's after harvest is completed.

Alternative 3

This alternative includes about 4,975 acres (1,525 acres high potential habitat) of selection harvest in potential goshawk habitat. Effects from this activity would be similar to those for Alternative 2. This alternative proposes the least amount of aspen harvest and there are no clearcuts, overstory removal or shelterwood treatments. In the short term, this would result in the aspen stands providing potential nesting habitat and larger blocks of continuous forest canopy. In the long term they would gradually convert to lower potential nesting forest habitat types and stand structure. There would be limited preferred prey habitat retained because no clearcuts were conducted to provide essential early successional habitat for primary prey species. There would be 1,235 acres of potential nesting habitat (440acres high potential) in mature aspen (> 40 years old). There would be the least amount of thinning harvest acres (56) of any of the alternatives. Underplanting, timber release, site prep burn work effects would be the same as in Alternative 2.
Within goshawk habitat, the proposed roadwork differs from the other alternatives in it has the most decommissioned and maintenance road miles and the least reconstruction miles. This would result in the least amount of potential roadwork activity within potential goshawk habitat of all alternatives.

Alternative 4

This alternative includes 4,200 acres (1,515 acres high potential habitat) of selection harvest in potential goshawk habitat and thinning harvest acres are similar to Alternative 2. The impacts from these 2 harvest activities would be similar to Alternative 2. This alternative proposes the most amount of aspen harvest and use of clearcut treatments. About 1,250 acres (525 acres high potential habitat) of aspen clearcutting would occur in potential goshawk habitat. This could remove potential nesting habitat and make it unavailable for several decades. There would be 230 acres of potential nesting habitat (18 high potential) would remain in mature aspen (> 40 years old) in the project area. The largest amount of high quality prey habitat for grouse and hare would be created through clearcut harvesting. This would result in a short-term loss of habitat, but develop more preferred habitat in the long term. Young forested

stands would be retained that can provide prey species habitat during the short-term period while clearcut stands regenerate.
There are 73 acres of overstory removal in potential goshawk habitat but none in high potential habitat and no shelterwood harvest treatments proposed. This treatment would reduce stand canopy closure under 70% and thus make them unsuitable for nesting by goshawks. Underplanting, timber releases, wildlife opening maintenance, underburn and site prep burn work effects would be the same as in Alternative 2.
The proposed roadwork in goshawk habitat for this alternative is similar to those in Alternative 2. The small differences would not change the possible effects occurring in suitable goshawk habitat, so the potential effects of this roadwork would be essentially the same.

Alternative 5

This alternative includes 4,630 acres (1,600 acres high potential habitat) of selection harvest in potential goshawk habitat. Thinning harvest acres (1,140 acres) are almost double the acres in Alternative 2 and 4 with about 875 acres in high potential habitat. About 150 acres (125 acres high potential habitat) of aspen clearcutting will occur in potential goshawk habitat. However, there would be 1,130 acres of potential nesting habitat (105 high potential) in mature aspen (> 40 years old) in the project area. There are no proposed acres of overstory removal or shelterwood harvests within potential goshawk habitat. The proposed roadwork for this alternative is similar to alternative 4 except that there would be less reconstruction and more maintenance miles.

Management Recommendation

A 30-acre woodland hawk nesting habitat (WHNH) block will be established within the stands that contained the two historical nest sites. These stands have proposed selection harvest treatments that would reduce canopy closure to approximately 70%. However in the WHNH block, the harvest prescription would maintain a canopy closure between 95 to 100%. This would provide habitat for the possible re-establishment of a nest site in those areas. Four other WHNH blocks will be established for red-shouldered hawks but they could be utilized by goshawks. Due to the sensitivity of these nest sites, the locations of these sites will not be disclosed.

Cumulative Effects

Forest management activities over the past 10 years in potential goshawk habitat have been selection harvest of northern hardwoods (7,645 ac.) and even aged management (2,578 ac.). Selection harvests (17% of area) conducted in hardwood stands may have resulted in the loss of potential nesting trees on private lands. Impacts to goshawks on FS lands would be less due to harvest programs on FS land would have required an analysis of possible effects to goshawks prior to approval of project activities. Selection harvest would temporarily reduce habitat quality by opening the canopy and making the stand unsuitable in the short-term. During this time, goshawks may have used these stands for hunting and nested where forest condition and management emphasize mature forest. In the long term, this harvest method would maintain habitat quality or improving it by increasing growth in remaining trees and improve prey species diversity. Past aspen management occurred on only 2% of the project area. This may have removed some nesting habitat but would have allowed for more mature aspens stands to remain. However, the lack of aspen management reduces the acres of early successional forest. This intern can negatively affect hare and grouse populations and the foraging opportunities for goshawks. All these timber harvests were scattered across the landscape and involved low acres over a long period of time. These activities would not have made conditions unsuitable for goshawks to affect their viability. Presently there is only 175 acres of various harvest treatments planned and they would not add additional impacts to goshawk or their habitat. Future harvest activities over the next 15 years will depend on the selected alternative. Alternative 4 proposes the highest acres of even aged management. This in addition with private lands acres would total about 8% of upland habitat of this treatment type. The largest amount of hardwood selection harvest acres is in Alt 3. This along with private land selection harvests acres would total about 25% of the upland habitat. The addition of woodland hawk nesting habitat blocks will provide oppertunities for new nest sites to develope.
The removal of young goshawks from the nest for Falconry was legal in the state of Wisconsin. However a closure order on the taking of young goshawks by falconers was issued in 1998. The closure order has expired, but a system is now in place that allows falconers a “take only by permit” on the CNNF. The amount of young taken by falconers is determined by the previous years known number of young fledged, with 10% of that being available for legal collection the following year. No take has occurred on the west side of the CNNF in recent years due to little or no reproduction. The east side has more suitable habitat and birds, therefore in 2001 there were 2 young allowed to be

removed form nests. Also occurring is the illegal taking of young goshawks and the magnitude of this on the NNF is unknown. The legal and illegal taking of young goshawks by falconers can negatively impact the local population by affecting the number of birds available for recruitment.
The cumulative effects of all action alternatives in combination with those activities on private lands would involve a continuation to varying degrees of current vegetation patterns and forest types. Activities would involve disturbances that would likely result in varying levels of both positive and negative habitat alteration. Habitat for prey species would be perpetuated with clearcuts, although probably not to the level found in past decades. Therefore, the effects from past, present and future actions on private lands, combined with the direct and indirect effects of proposed Alternatives would not negatively impact goshawks.
Conclusion: Short term there may be impacts to individuals but not likely to cause a trend towards federal listing or loss of viability. Long-term beneficial effects would occur with the improvement and development of nesting habitat, as larger diameter trees become established to improve stand structure. Prey base habitat (early successional) would also improve to provide addition foraging habitat.

7.1.2 LeConte's Sparrow (*Ammodramus leconteii*)

This bird species prefers open grassland, sedge meadow, and shallow marsh. The Nicolet National Forest Breeding Bird Survey (NNF BBS) has no records of this species on the NNF. Pre-screening of potential habitat was done using criteria established by Forest biologists, and included factors such as stand age, type and structure. Approximately 35 acres of potential sparrow habitat was identified within the MPA by GIS habitat analysis. There are no proposed harvest activities within this stand, however, there is a stand adjacent to it with proposed harvest activities This stand was surveyed in June 2001 through a contract with students with birding experience from University Wisconsin-Green Bay (UWGB) and no birds were identified. Since no birds were located and none of the proposed activities would cause this habitat to become unsuitable, there would be no direct, indirect, or cumulative effects on this species. Management activities will be reassessed if this species is found within the MPA.
Conclusion: No impact.

7.1.3 Upland Sandpiper (*Bartramia longicauda*)

This bird species prefers open grassland with mixture of short and tall grasses in areas larger than 150 acres (Risk Evaluation, 2002a). The NNF BBS has 2 records on the La/La RD but none within the MPA. Pre-screening of potential habitat was done using criteria established by Forest biologists, and included factors such as stand age, type and structure. Approximately 35 acres of potential sandpiper habitat was identified within the MPA by GIS habitat analysis. There are no proposed harvest activities within this stand, however, there is a stand adjacent to it with proposed harvest activities This stand was surveyed in June 2001 through a contract with students with birding experience from UWGB and no birds were identified. Since no birds were located and none of the proposed activities would cause this habitat to become unsuitable, there would be no direct, indirect, or cumulative effects on this species. Management activities will be reassessed if this species is found within the MPA.
Conclusion: No impact.

7.1.4 Red-shouldered Hawk (*Buteo lineatus*)

The red-shouldered hawk (RDSH) is a medium to large woodland hawk that is wide spread in eastern United States, southeastern Canada, California and Mexico. Prior to 1900 it was one of the most common hawks in eastern US, but as with the goshawk, the logging era of the 1900s removed prime nesting habitat and the use of pesticides probably contributed to its decline. Presently RDSH populations appear to be very low, but stable and scattered throughout the north central states, with a few local areas where they are relatively common (Jacobs and Jacobs, 2002). In Wisconsin, it is an uncommon summer resident and breeding birds have been reported from many counties across the state. This raptor is less frequent in the southeastern one-third of the state where agriculture areas are dominant (Jacobs and Jacobs, 2002).
Preferred habitat by RDSH is mature hardwood forest, found in riparian, wet or moist forest or upland forest adjacent to ponds, wetlands or swamps. Nest trees most commonly used are American beech, maples, oaks and birch. These trees are typically taller and larger than other trees in the stand that are often between 17-40 cm dbh and have a canopy closure $\geq$70%. Forested landscapes that have very open canopy and/or fragmentation enables red-tailed hawks and great horned owls to possibly displace or kill RDSH. Water is also a critical element because these wet areas are used as foraging sites. Primary food items can vary from area to area or year-to-year but common species are frogs, toads, small mammals and birds. Home range sizes are dependent on the availability of nesting and foraging habitat. In northeastern Wisconsin, J. Jacobs (2002) found that the average home range size is between

90-175 ha. These territories and nest trees do have a high percentage of reoccupancy from one breeding season to the next. Some reuses of nesting territories have occurred in stands that have had select timber harvests take place during non-breeding months (J. Jacobs, personal communication).

The habitat suitability requirements for RDSH's are similar to northern goshawk. The major difference is the presents of water near or within the stands. Due to the similarities, the rational and protocol used in the goshawk GIS habitat analysis was used for RDSH. Depending on alternatives, there are approximately 5,315-5,600 acres of potential RDSH habitat identified with proposed harvest treatments. This habitat is scattered in the southern portion and is in larger continuous blocks in the northern part of the MPA. Surveys will be conducted between March 15 and April 15 using the call-back survey protocol within all potential habitat that have proposed harvest treatments. Potential habitat that had winter and selective harvest only treatments were excluded from call-back surveys. These harvest techniques would not cause disturbance to birds or negative alterations of their habitat (J. Jacobs, per. comm.). These stands will be visually surveyed for nests during timber marking procedures by personnel that complete a woodland raptor nest identification workshop. Historical nesting territories were obtained from J. Jacobs, RDSH Biologist, who has been conducting RDSH research in this area for the past 30 years. Due to the sensitivity of RDSH nest sites, their locations will not be given in this document. There are five known nest sites within the MPA. Forest Plan Standard and Guidelines for RDSHs would be followed to prevent disturbance to nesting birds or alteration of adjacent habitat at all nest sites.

Alternative 1

This alternative would not have any direct or indirect effects on potential RDSH habitat. There would be no timber management activities occurring in the project area and natural succession would not substantially alter hardwood or riparian habitat suitability conditions. Instead, these habitats would expect to improve in quality as the stands mature through natural succession. Prey species and their habitats would not be negatively affected.

Alternative 2

This alternative includes selection harvest in about 4,874 acres (1,588 acres high potential habitat) of potential RDSH habitat (Table 7). However, 1,928 acres would occur in potential habitat (987 in high potential) that would be winter harvest only and would not directly impact birds. Thinning harvest activities would occur on 724 acres of potential habitat; 184 acres would be high potential habitat. Only 6 acres of clearcuts would take place and no overstory removal or selterwood cuts would occur in potential RDSH habitat. All these harvest treatments would have same impacts to RDSHs and their habitat as they did to goshawks that were detailed in the goshawk section. Some temporary disturbance could occur from harvest activities near small wetlands that are potential foraging areas. This could result in RDSH's selecting other foraging sites until the activity concluded. There are many stands that have wetlands that will not be harvested or will be harvested in winter that can provide undisturbed foraging opportunities. Wisconsin's Forestry Best Management Practices for Water Quality will be implemented that would protect these riparian areas. Therefore, there would be no short or long-term impacts to foraging habitat in this alternative and others.

Hemlock and butternut regeneration in sugar maple-basswood stands would not negatively impact the stands that are RDSH habitat. This result would be the same for the hemlock underplanting and release of mixed northern hardwoods (Table 8). The proposed under burns would take place in northern red oak stands of medium quality. There are no known nests in these stands or in the surrounding area. If surveys determine RDSH occupancy, burns would be postponed until another year when birds are not occupying these stands or conducted in late fall when birds have migrated.

Table 7. RDSH habitat with proposed harvest treatments, numbers in ( ) are winter harvest only. Alternative 1 would have 0 acres of harvest treatments.

	Alternative 2			Alternative 3			Alternative 4			Alternative 5		
	RDSH Habitat			RDSH Habitat			RDSH Habitat			RDSH Habitat		
	High	**Med**	**Total**	**High**	**Med**	**Total**	**High**	**Med**	**Total**	**High**	**Med**	**Total**
CC	0	6	6	0	0	0	73	513	586	0	0	0
OR	0	0	0	0	0	0	0	0	0	0	0	0
Sel	1588 (987)	3286 (941)	4874 (1928)	1486 (888)	3678 (912)	5164 (1800)	1515 (988)	2828 (873)	4343 (1861)	1588 (988)	3252 (1340)	4840 (2328)
SW	0	0	0	0	0	0	0	0	0	0	0	0
Thin	184	540	724	133	16	149	176	491	667	176	574	750
Total	1772 (987)	3832 (941)	5604 (1928)	1619 (888)	3694 (912)	5313 (1800)	1764 (988)	3832 (873)	5596 (1861)	1764 (988)	3826 (1340)	5590 (2328)

CC = clearcuts

OR= overstory removal

Sel = selection cut

SW = shelterwood

Thin = thinnings

Table 8. Acres of selected proposed activities in RDSH habitat based on Alternatives. Alternative 1 would have no management acres.

Activity	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Regeneration				
Butternut	26	26	26	26
Hemlock	111	111	57	111
Under plant				
Hemlock	20	20	0	20
White pine	0	0	55	55
Release	20	20	20	20
Underburn	119	0	119	119

There is only one known active RDSH territory within 0.25 miles of the proposed C or D level road construction or reconstruction. If surveys determine RDSH occupancy at this proposed site, road construction would be postponed until another year when birds are not occupying these stands or in fall after migration. The 20-foot wide corridor created for construction or reconstruction of C and D levels roads may cause temporary breaks in the canopy. However there will be large overhanging branches from upper canopy that will aid in reducing this gap and would allow suitable habitat to remain intact. Proposed reconstruction of these level roads is the second highest of the alternatives (Table 9) in RDSH habitat. This type of work would create small canopy gaps, however these gaps are not considered detrimental to RDSH habitat. Disturbance from travel on these roads during the critical nesting period would be minimal due to this time of year roads are in poor condition and not frequently traveled. Maintenance of roads would not negatively impact suitable habitat, as the forest canopy would remain intact. Miles of decommission roads are the least amount (Table 9) of any alternative. Decommissioning roads would be beneficially as it would reduce impacts to soil and water resources. If surveys determine RDSH occupancy at these proposed sites, road construction would be postponed until another year when birds are not occupying these stands or in fall after migration.

Table 9. Miles of proposed road management in RDSH habitat based on Alternatives. Alternative 1 would have no road management.

	Alternative 2			Alternative 3			Alternative 4			Alternative 5		
	RDSH Habitat			RDSH Habitat			RDSH Habitat			RDSH Habitat		
	High	Med	Total	High	Med	Total	High	Med	Total	High	Med	Total
Close	0.00	0.00	0.00	0.00	0.52	0.52	0.00	0.52	0.52	0.00	0.52	0.52
Con-C	0.95	0.00	0.95	0.00	0.00	0.00	0.95	0.00	0.95	0.00	0.05	0.05
Con-D	0.50	0.32	0.82	0.00	0.00	0.00	0.43	1.18	1.61	0.82	0.32	1.14
Decom.	5.75	5.14	10.89	7.19	7.56	14.75	7.10	6.41	13.51	8.87	7.03	15.90
Recon-C	2.28	5.07	7.35	0.00	0.26	0.26	1.12	3.83	4.95	0.00	0.77	0.77
Recon-D	0.45	0.75	1.20	0.38	0.17	0.55	0.45	1.10	1.55	1.02	2.59	3.61
Maintain	1.33	5.80	7.13	3.61	11.04	14.65	2.49	6.51	9.00	3.61	8.24	11.85
Drop	0.17	0.00	0.17	1.45	0.45	1.90	0.07	0.00	0.07	0.63	0.00	0.63
Total	11.43	17.08	28.51	12.63	20.00	32.63	12.61	19.55	32.16	14.95	19.52	34.47

Alternative 3

This alternative would have the least amount of selection, thinning and overall harvest acres in high potential RDSH habitat (Table 9). However, it has the most selective harvest acres in medium rated habitat and the least amount of selective/winter harvest acres. There would be no clearcuts, overstory removal or shelterwood harvesting within

potential RDSH habitat. All these harvest methods would have the same impacts to RDSHs as to goshawks detailed in that section. Regeneration and underplanting projects would be the same as alternative 2 and there would be no prescribed burns in potential RDSH habitat. There would be no new small canopy gaps due to any construction of C or D level roads in this alternative. There is very little proposed reconstruction of roads and no known nests are within 0.25 miles of these sites. Decommission and maintenance road mileage amounts are both some of the highest in alternative comparison.

Alternative 4

This alternative would have the highest amount of acres being clearcut in potential RDSH habitat (Table 9). These clearcuts would open up the habitat that could increase the chances of great horned owls and red –tailed hawks developing new territories in the area. The selection and thinning harvests in high potential habitat is similar to alternative 2, however the acres thinned in medium rated habitat is the lowest of all alternatives. All these harvest methods would have the same impacts to RDSHs as to goshawks detailed in that section. Hemlock and butternut regeneration in sugar maple-basswood stands would not negatively impact these stands that are RDSH habitat. This result would be the same for the white pine underplanting, release of mixed northern hardwoods and proposed under burns. There is only one known active RDSH territory within 0.25 miles of the proposed C or D level road construction or reconstruction in this alternative. If surveys determine RDSH occupancy at this proposed site, road construction would be postponed until another year when birds are not occupying these stands or in fall after migration. Proposed construction of these roads is the highest and reconstruction is second highest of the alternatives, which could create small canopy gaps.

Alternative 5

This alternatives harvest acres in potential nesting habitat are very similar to alternative 2 except there would be more acres (400) harvested during winter months. All these harvest methods would have same impacts to RDSHs as goshawks detailed in the section above. Hemlock and butternut regeneration in sugar maple-basswood stands would not negatively impact these stands that are RDSH habitat. This result would be the same for the hemlock and white pine underplanting, release of mixed northern hardwoods and proposed under burns. There is only one known active RDSH territory within 0.25 miles of proposed C or D level road construction or reconstruction in this alternative. Proposed construction of these roads is the lowest and reconstruction is third highest of the alternatives, which could create small canopy gaps.

Management Recommendation

Four 30-acre WHNH blocks will be established within stands that have potential RDSH habitat. These stands have proposed selection harvest treatments that would reduce canopy closure to approximately 70%. However in the WHNH block, the harvest prescription would maintain a canopy closure between 95 to 100%. RDSH are capable of nesting in forests that have a canopy closure of 80%, but there are some birds that are more sensitive to this habitat component and require a higher canopy closure percentage (J. Jacobs, personal communication). Due to the sensitivity of these nest sites, the locations of these sites will not be disclosed.

Cumulative Effects:

Cumulative effects on private and public uplands in upland hardwood habitat would be similar to those discussed in the goshawks section. Additional RDSH habitat with past activity would include about 90 acres of oak and 15 acres lowland hardwood selection or improvement harvests. Selection cuts retain high canopy closure and can result in an increased tree size in hardwoods, which increases potential for suitable nesting sites. Improvement treatments may have reduced canopy closure enough to make stands unsuitable for RDSH's in the short-term, but generally the canopy fills in over the long-term. Other management that could have affects are those that altered vegetative conditions in riparian areas. There are no records of these activities occurring in the past, present or future. Future harvest activities over the next 15 years on private lands include 12 acres lowland hardwoods, and 600 acres of oak harvest in Marinette County. All these activities would have minimum impact on RDSH habitat due to the harvests methods and long period of time they would occur over. Forest-wide, existing mature hardwood or mixed hardwood/conifer stands continue to provide suitable nesting and foraging habitat for RDSH. Addition of woodland hawk nesting habitat blocks will provide more oppertunities for new nest sites. Also, no adverse impacts are anticipated to the birds because only small portions of the forest are disturbed (usually temporarily) each year. Impacts related to weather, and mammalian predators appear to impact these species more so than human related disturbance.

The cumulative effects of all action alternatives in combination with those activities on private lands would involve

a continuation to varying degrees of current vegetation patterns and forest types. Activities would involve disturbances that would likely result in varying levels of both positive and negative habitat alteration. Therefore, the effects from past, present and future actions on private lands, combined with the direct and indirect effects of proposed Alternatives would not negatively impact RDSHs.

Conclusion: Short term there may be impacts to individuals but not likely to cause a trend towards federal listing or loss of viability. Long-term beneficial effects would occur with the improvement and development of nesting habitat, as larger diameter trees become established to improve stand structure.

7.1.5 Swainson's Thrush (*Catharus ustulatus*)

The Swainson's thrush occurs throughout northern portions of the northeastern and western United States and the boreal forests of Canada, and Alaska. It migrates south during the winter to southern Mexico to Peru, Brazil, and Argentina and may winter in the West Indies. In Wisconsin, it is considered an abundant migrant during spring in early May to June and during fall in early August to October. It is an uncommon resident in the coniferous habitat of the northern part of the state. (Robbins 1991). On the CNNF, it is confined to the northern portions of both land bases, with the greatest likelihood of occurrence in the Great Divide and Eagle River/Florence districts. Most of the confirmed state Breeding Bird Atlas records are from these districts, together with one from the northwestern corner of Lakewood/Laona district. The number of Breeding Bird Survey routes recording this species (nationally) has increased over 20 years (NRRI, 2002a), but has been showing declines in the NNF BBS (Bob Howe, personal communication.). The Swainson's thrush is classified as both a mature forest and conifer-dependent species. Its breeding habitat often contains both deciduous and coniferous trees, but that the species strongly prefers high conifer density in the understory (NRRI, 2002a). Nests are usually found in small trees and often 2 m or less aboveground close to the tree trunk; often in conifer or sometimes deciduous trees or shrubs (NatureServe, 2002). Swainson's most frequently hunts from a low branch, moving from perch to perch searching for prey on the ground or within low branches. They feed primarily on insects; (beetles of all kinds, weevils, ants, wild bees, wasps, caterpillars, spruce bud moths, mosquitoes) but will eat earthworms, domestic and wild cherries, blackberries, raspberries and seeds.

The NNF BBS has recorded observations at low levels on both districts (27 on ER/FL and 20 LA/LA) but none within the MPA. These records have occurred in a variety of habitats that include mixed northern hardwoods, red pine, aspen, lowland black spruce and mixed swamp conifer. Pre-screening of potential habitat was done using criteria established by Forest biologists, and included factors such as stand age, type and structure. Approximately 584 acres of potential thrush habitat was identified within the MPA by GIS habitat analysis. There are no proposed harvests or road activities within these stands, however, there are 22 stands that have proposed harvest activities adjacent to them. Of these, 13 have buffer mitigation measures established for protection of the adjacent low land habitat (potential thrush habitat) or have no clear cuts proposed. The remaining 9 stands have a varied proposed harvest treatments depending on alternative and these will be the focus of potential effects. Surveys were conducted in June 2001 by UWGB students, and in June 2002 by Forest Service biologist and no birds were identified in these stands.

Alternative 1

Under Alternative 1, no changes to the landscape would occur due to management and Swainson's thrush habitat would remain unchanged. This alternative would not have any effect on potential thrush habitat, since there would not be any planned harvesting within the project area and natural succession would not substantially alter lowland conifer habitat suitability.

Alternative 2

This alternative has proposed 7 clearcuts and 1 proposed thin in stands adjacent to potential thrush habitat. All but one of these stands boarders less than 35 % of the lowland area so potential negative impacts to the habitat will be minimal and short term. There are no impacts to Swainson's thrush from road construction due to no road construction is proposed with this or any of the other alternatives.

Alternative 3

This alternative has 0 clearcuts and 1 proposed thin in stands adjacent to potential thrush habitat. This would have the least amount of impact of all alternatives.

Alternative 4

This alternative has 9 clear cuts in stands adjacent to potential thrush habitat. All but one of these stands boarders less than 35 % of the lowland area so potential negative impacts to the habitat will be minimal and short term.

Alternative 5

This alternative has 9 clear cuts and 3 thinnings in stands adjacent to potential thrush habitat. All but one of these stands boarders less than 35 % of the lowland area so potential negative impacts to the habitat will be minimal and short term.

Cumulative Effects:

The two general habitat types favored by Swainson's thrush are mature mixed hardwood/conifer, and mature lowland conifer. Forest management activities in hardwoods over the last 10 years on private lands within potential Swainson's thrush habitat were identified in the goshawk cumulative effects section. There has been no known harvest of lowland conifer on private or public lands in these areas during that time. The mature mixed hardwood/conifer type has typically been managed by selection harvest, and this will likely remain the case for most stands of this type within the project area in the future. This type of harvest has minimal long-term impacts to the forest compared to clearcutting, while encouraging increased growth of remaining trees, and encouraging growth of understory species. Lowland conifer habitat remains relatively unaltered with natural features and species composition due to not being heavily harvested at the turn of the century. These harvest trends will likely continue for these types thus providing secure nesting habitat for this species. The cumulative effects of this project therefore include the potential for some short-term direct effects from disturbance, together with a long-term maintenance of suitable habitat for this species.
Conclusion: May impact individuals but not likely to cause a trend towards federal listing or loss of viability.

7.1.6 Black tern (*Chlidonia nigerr*)

These birds prefer large areas of shallow protected water with abundant aquatic vegetation. The NNF BBS has 27 records, with 9 of these occurring on the La/La RD (Atkins and Wabikon Lake) but none within the MPA. There are non-BBS observations at Reservoir Pond that is approximately 1.5 miles west of the MPA. The Townshed Flowage and Knowles Creek Impoundment areas could be considered potential habitat because of isolated bays and shallow waters with interspersed vegetation. None of the proposed activities would affect water quality, recreation use, or vegetation at these sites, therefore there would be no direct, indirect, or cumulative effects on this species from project activities. Management activities will be reassessed if this species is found within the MPA.
Conclusion: No impact.

7.1.7 Wood Turtle (*Clemmys insculpta*)

The wood turtle is a medium sized turtle with an original North American range that extended from Nova Scotia to eastern Minnesota, south to northeastern Iowa, east to Virginia and north to New York. It is now threatened or endangered in much of this range primarily due to exploitation by commercial pet trade, incidental collection by recreationists, bank erosion, habitat alteration, and road mortality. In Wisconsin, wood turtles were once found throughout the state, except in the southwestern-most portion. Presently, small-scattered populations exist in isolated habitat mainly along the Black, Wisconsin, St. Croix, Brule, Oconto and Baraboo Rivers (WDNR, 2002a). The wood turtle has only been observed in the south half of the district and most of these observations have been along the Oconto River and its tributaries. There has also been one confirmed nesting location in the southern part along the Oconto River. There have been no records of wood turtles in the MPA.
Wood turtles prefer lowland hardwood forests, alder and open wet meadows associated with moderate to fast current streams and rivers with sand or gravel substrates. They forage in upland deciduous mesic forest and open meadows in summer. They use south facing sandy riverbanks or flat sandy soil openings adjacent to rivers for nesting sites. Hatchlings and juveniles prefer alder thickets associated with shorelines and are considered critical habitat for this segment of the population. Wood turtles are opportunistic omnivores and have a strong preference for vegetable matter, including fruits, berries, tender leaves, and mushrooms. They will however consume insects, mussels, carrion, with invertebrates and plant matter predominant (WDNR 2002a, NatureServe, 2002). Turtles are active diurnally from March to November, especially in the morning. They are solitary in late spring and summer when mostly terrestrial and then return to rivers in September and October. They can exhibit fidelity to a particular stream or brook and may aggregate in or near hibernation sites. Reproductive activity (eg. courtship, copulation) is aquatic and they lay clutches of 4 to 18 eggs (avg. 8) in late May or June. This species is a communal nester and females from several miles of stream may congregate in a discrete, traditional site each year to nest. Home ranges of wood

turtles are often elongate because of the tendency to follow streams. A Wisconsin study found that wood turtle home ranges averaged less than 1 ha. In Pennsylvania, studies found turtles averaged 447 m in greatest distance between recapture points and that the longest axis of the home range was 356-578 m (mean 463 m). In nearby Michigan, wood turtles were typically found within 50 feet of a stream and never more than 500 feet from water in 20 years of study (NatureServe, 2002).

The section of the North Branch of the Oconto River (NBOR) that travels through the MPA is the only stream in the analysis area that could provide suitable habitat, but it has had no documentation of wood turtles. The southern section of this river on the District has several observation records and the closest of these is approximately 3.5 miles down stream of MPA. Observations not associated with the NBOR outside the MPA area are of a turtle crossing Hwy 32 approximately 0.50 miles south of Lakewood and another about 3.5 miles to the east near Lackawanna Lake. In June 2002, Tom Moris, Biologist CNF, surveyed the NBOR and identified two sand-gravel banks adjacent to the river. The Hemlock Dam site (T33N, R15E, SE ¼ Section 1) is a gravel back-in boat launch for a small-impoundment above this dam and has minimal nesting habitat. The Holt Dam (T33N, R16E, E ½, SW ¼, Section 5) is dirt fill from the dam structure and provides good nesting habitat. This site was surveyed 3 times in June and no wood turtles were observed; this survey period is later than normal due to an unusually long winter that has delayed nesting dates by approximately 7-10 days.

Since no historical records of turtles occur in the MPA and none were observed at the possible nesting site and proposed activities would not cause their habitats to become unsuitable, there would be no direct, indirect, or cumulative effects on this species. Management activities will be reassessed if this species is found within any stand with proposed activities in the MPA.

Conclusion: No impact.

7.1.8 Trumpeter Swan (*Cygnus buccinator*)

These birds prefer large areas of shallow protected water with abundant aquatic vegetation. There has been no documentation of these birds or are there any ongoing DNR reintroduction programs on the La/La RD. Knowles Creek Impoundment areas could be considered potential habitat, because of some relatively isolated bays and shallow waters with interspersed vegetation. None of the proposed activities would affect water quality, recreation use, or vegetation at these sites, therefore there would be no direct, indirect, or cumulative effects on this species from project activities. Management activities will be reassessed if this species is found within the MPA.

Conclusion: No impact.

7.1.9 Cerulean Warbler (*Dendroica cerulea*)

The Cerulean Warbler is a long distance neotropical migrant that is found in large tracks of mature deciduous forests of eastern North America. It is typically found in the Ohio and Mississippi River valleys and its range generally extends from the eastern Great Plains, north to Minnesota; east to Massachusetts; and south to North Carolina and Louisiana. In Wisconsin it's an uncommon migrant south and central and a rare migrant north (Robbins 1991). The USFS R9 RFSS Status report for ceruleans describes the CNNF as at its extreme edge of its range with only several isolated observations. Wisconsin's Breeding Bird Atlas has records of confirmed, probable or possible breeding warblers in only 3.8% of 3,084 survey blocks throughout the state, with most birds being found in the southern half of the state and none in Forest or Oconto County (WBBA, 2002). The Cerulean Warbler Atlas Project (CEWAP) conducted surveys in the state with most in the southern one-third of the state, however birds were observed in west-central and northeast (Forest County) parts of the state. No records of cerulean were reported for Forest or Oconto Counties by the DNR in the Natural Heritage Inventory.

Cerulean warbler's primary habitat is most often described as mature deciduous forest, typified by structurally mature hardwood species in mesic or floodplain conditions with a semi-open canopy (Rosenberg 2000). Hamel (2000) concludes that the warbler maybe somewhat opportunistic in seeking the most mature forest condition available in each region and that dominant tree and understory species also tend to vary by region. The CEWAP reported in Wisconsin that 56% of their cerulean records were in mesic upland forest and 31% were in bottomland riparian sites that were dominated primarily by oaks, maples or hickory trees. Some of the most frequently mentioned stand features were tall, large continuous tracts of deciduous forest with broken or irregular forest canopy structure and a good development of vegetation strata, i.e., distinct zonation of canopy, subcanopy, shrub, and ground-cover layers (Hamel 2000 and Rosenberg 2000). Flaspohler (1993) also reported that ceruleans were often found near small canopy openings. Several studies provide evidence suggesting that the warbler is an area-sensitive species. In southern Wisconsin, these warblers were more commonly found in medium (40-80 ac) and large (>80 ac) forest tracts than in small tracts (<40 ac). In east-central Illinois, the birds were not detected on study plots of less than 65 ha (160 ac) (NRRI, 2002b). The warblers nest in a wide variety of trees, but tend to be found in oaks or maples. Nests are placed usually on lateral limbs of deciduous trees in midstory or overstory canopy, and concealed from above by clumps of live leaves on small twigs of the nest tree, or by clumps of leaves of vines growing along

the nest branch. They are also often located over an open space that can range from 1-20 meters between the nest branch and a lower branch of the same tree (Hamel 2000). Ceruleans are insectivores, taking their foods from leaf bases and foliage of a variety of trees.

The Nicolet National Forest Breeding Bird survey (BBS) has 11 records of cerulean warblers, but most of these identifications are questionable due to no visual confirmation and their songs are similar with black-throated blue (*Dendroica caerulescens*), northern parula (*Parula american*) and golden-winged warblers (*Vermivora chrysoptera* (Bob Howe, NNF-BBS Coordinator, personnel communication). Dr. Howe also believes that ceruleans are transient and are not well established on the NNF. No observations have occurred at 12 BBS sites within the MPA. Pre-screening of potential habitat was done using criteria established by Forest biologists, and included factors such as stand age, type and structure. Approximately 1,770 acres of potential cerulean warbler habitat was identified within the MPA by GIS habitat analysis.

In June 2001, UWGB students surveyed all these stands and in 2002 Scott Anderson surveyed an additional stand of 36 acres. UWGB students identified a cerulean in 2001and this stand was then dropped from all proposed alternatives. This stand has had harvest treatments twice in the past; an improvement cut in 1978 and a selection cut in 1994. It is a high quality site with better than average height growth with a habitat type is AviO. There is a relatively dense understory of several layers of mixed northern hardwood species. The overstory contains a mixture of species, but most notably there are some very tall red oaks. Directly to the west of this stand is a 640-acre section of northern hardwoods that is intensively managed by Nicolet Hardwoods.

Alternative 1

Under Alternative 1, no changes to the landscape would occur due to management activities. Cerulean warbler habitat would remain unchanged as natural succession would not substantially alter hardwood habitat suitability or riparian condition.

Alternative 2, 3, 4 and 5

All alternatives have similar acres of harvest activities within cerulean habitat. Due to this, all alternative effect analysis will be combined together (Table 10).

Table 10. Table Proposed activities within potential cerulean habitat.

	Alternative 2		Alternative 3		Alternative 4		Alternative 5	
	CERW Habitat		CERW Habitat		CERW Habitat		CERW Habitat	
	High	Winter Harvest	High	Winter Harvest	High	Winter Harvest	High	Winter Harvest
CC	0	0	0	0	26	0	0	0
Select	1577	405*	1486	399*	1515	405*	1577	405*
Thin	156	0	113	0	156	0	156	0
Total	1733	405	1599	399*	1734	405*	1733	405*

* Additional 488 ac could be applied that are identified as winter or dry summer harvest.

Selection harvest would remove individual trees of all sizes from the stands to reduce competition and allow for increased growth in remaining trees making them more desirable nesting habitat. Habitat suitability should not be affected because canopy closure would remain high (>70%) after the harvest. Small gaps in the canopy will occur to provide nesting habitat. This will also allow sunlight to the understory to develop the intermediate trees that are a major component of cerulean habitat. A large portion of the harvests will occur during the winter, which would reduce direct impact to birds and their nesting. Thinning harvest activities can open the stands canopy and make them unsuitable nesting habitat for several years. However, during this time the understory will become more developed and suitable for ceruleans as will the forest canopy. Clearcuts in cerulean habitat would only occur in one stand in Alternative 3. This 26-acre stand did not have any ceruleans identified in it during surveys and it occurs at the edge of a large block of cerulean habitat so fragmentation would be minimal. There would be no overstory removal or shelterwood cuts occurring within potential CEWA habitat. All oak under burns, under planting of hemlock and white pine and mixed hardwood release occur in stands that are considered low cerulean habitat. Road system management miles within cerulean habitat are minimal and thus effects will be also (Table 11).

Table 11. Road management miles within potential cerulean habitat.

Road Wk	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Con-C	0.88	0.00	0.61	0.00
Con-D	0.49	0.00	0.69	0.76
Decom.	5.50	6.94	6.84	6.33
Recon-C	1.86	0.00	1.02	0.05
Recon-D	0.45	0.38	0.45	1.02
Maintain	1.27	3.13	2.11	3.08
Drop	0.17	1.37	0.06	0.62
Total	10.62	11.82	11.78	11.86

Cumulative Effects:

Cumulative effects on private and public uplands in upland hardwood habitat to cerulean warblers would be similar to those discussed in the goshawks section. Proposed northern hardwood management will likely maintain or possibly improve potential habitat for ceruleans. Selection cuts retain high canopy closure with some small gaps that result in an increased tree size in hardwoods and well-developed understory that can increases potential for suitable nesting sites. Aspen management could have some negative effects from fragmentation of larger habitat patches. However, future management trends would maintain many larger habitat patches, both within the project area and elsewhere on the Forest. In the future mature hardwood forest stands would be typically managed by selection harvest on public and private lands and the impact would also be minimal.
Conclusion: Short term there may be impacts to individuals but not likely to cause a trend towards federal listing or loss of viability. Long-term beneficial effects would occur with the improvement and development of nesting habitat, as forest gaps and larger diameter trees become established to improve stand structure.

7.1.10 Spruce Grouse (*Falcipennis Canadensis*)

These birds prefer large blocks of dense conifer cover, including lowland black spruce and upland types such as balsam fir and jack pine. However, the upland jack pine sites stands need to be in conjunction with a bog matrix to be considered suitable habitat (PVA, 2002).
There has been no documentation of these birds in the MPA, but there are records approximately 6 miles to the east of the area. There are no proposed timber harvests in balsam fir stands and the jack pine proposed harvests occur in areas that do not have an associated bog or lowland habitat and are then considered unsuitable habitat. Since the proposed activities do not occur spruce grouse habitat, there would be no direct, indirect, or cumulative effects on this species. Management activities will be reassessed if this species is found within the MPA.
Conclusion: No impact.

7.1.11 Green-faced clubtail (*Gomphus viridifrons*)

This species prefer warm water medium (>100') sized, fast streams with fairly clean gravel/sand substrate. They are found close to shore and in fast current areas of streams, but are not found in big rivers or trout streams. There has been no documentation of green-faced clubtails and their habitat is limited within the MPA. None of the proposed activities would affect water quality, recreation use, or vegetation at these sites, therefore there would be no direct, indirect, or cumulative effects on this species from project activities. Management activities will be reassessed if this species is found within the MPA.
Conclusion: No impact.

7.1.12 Northern Blue Butterfly (*Lycaeides idas nabokovi*)

The northern blue butterfly is known only from the western Great Lakes region of southeastern Manitoba, western Ontario, Minnesota, northern Wisconsin, and the Upper Peninsula of Michigan. This butterfly is distinguished from other subspecies by subtle taxonomic characters and (most significantly) its dependence on its larval food plant the Dwarf Bilberry. Little is known about the historic distribution of northern blue butterflies, although it probably was more widespread near the periphery of its range where native plant communities have undergone significant changes

since the late 1800's and early 1900's (Wolf and Brzeskiewicz, 2002). Both the Northern blue and dwarf bilberry are found on national forest lands of all three Lake States; in all three cases at least one of the sites is critical for regional persistence of these species. In Wisconsin, it occurs in a few sites in the northeastern part of the state in pine/oak barrens habitat in Marinette, Florence, Forest, Langlade and Oconto Counties. The Oconto County site (T33 R17E) is on the La/La RD and probably supports Wisconsin's second largest metapopulation. At least 4 other dwarf bilberry patches occur within 5 km of the main Waubee Lake site, including 3 sites on the CNNF.

The northern blue butterfly is found only near were dwarf bilberry is found. The host plant occurs in small patches beneath scattered pine on deep, sandy soil in association with bracken, sweet fern, barrens strawberry, and other blueberries. Openings in pine/oak forest or barrens habitat with scattered frost pockets may support the host plant. The butterflies have also been observed nectaring on dogbane, yarrow, hawkweed, and clover. Wildlife opening management that utilizes prescribed burns need to protect dwarf bilberry bushes and all life stages of the butterfly. Possible protection measures are cutting over shading trees in and around the breeding habitat and burning areas adjoining this habitat in an attempt to expand its range. Due to the small size of their breeding habitat, caution should be taken not to burn these openings in their entirety.

In Wisconsin, the butterflies have a single flight period each year with the peak adult flight usually occurring during the first two weeks of July. Males emerge earlier than females and the earliest dates of these flights occur during mid-June and latest by mid- August. A female lays her eggs singly on or beneath the bilberry plants or on surrounding vegetation or dead twigs. Individuals overwinter in the egg stage and the larvae hatch in May and pass through 3-4 lifecycles before pupation occurs during mid-June. Several different life history stages may be present at one time due to the varying in timing of these spring events (Wolf, 1993). In 1990-1991and 2001surveys for northern blue butterflies were conducted on the La/La RD. In 1990, Les Ferge, State Lepidoptera Expert, conducted surveys at 16 sites and found northern blue butterflies at 5 sites that were mainly clustered in one area within T33 R17E. Amy Wolf, Cofrin Center for Biodiversity, University of Wisconsin-Green Bay, conducted surveys at five locations within T33 R17E in 1990, 1991. Wolf (1993) estimated a population of almost 1000 adults here at the Waubee Lake sites during 1991 and observed approximately 50 individuals in the summer of 2001 (Wolf and Brzeskiewicz, 2002). These Waubee Lake locations are approximately 0.10 and 0.50 miles outside the MPA from the eastern border (Jack Pine Camp Special Area).

Steve Janke, CNNF Plant Ecologist, identified potential habitat on the east side of the MPA, which are all within a couple miles of the Waubee Lake locations. This potential habitat included 27 stands of small wildlife openings surrounded by jack and red pine that have proposed harvests treatments and/or proposed red oak under burns. During June-August 2002, field surveys for northern blue butterflies and dwarf bilberry were conducted. No plants or butterflies were identified and none of these stands had any of the unique characteristics that define northern blue or bilberry habitat. Since no northern blue butterflies, dwarf bilberry plants or appropriate habitats were located and none of the proposed activities would cause these habitats to become unsuitable, there would be no negative direct, indirect, or cumulative effects on this species. Management activities will be reassessed if these species are found within the MPA. Positive impacts to habitat may result at a 1.5 acres opening that is within a prescribed under burn unit as part of Alternative 2,4, and 5. The burn would remove brush and grass that may allow host plants and than butterflies to become established.

Conclusion: Beneficial impacts from prescribed burn developing potential habitat.

7.1.13 Pine Marten (*Martes Americana*)

This weasel like species prefer mature, dense conifer forests of northern white cedar, balsam fir, spruce and eastern hemlock, especially where trees have fallen (WDNR, 2002b). There have only been scattered observations of marten on the District with no records in the MPA. There has also been no report that the District is a population source for the Forest (A. Wydeven, WNDR, personal communication). Marten habitat is limited within the MPA. None of the proposed activities would affect these habitats, therefore there would be no direct, indirect, or cumulative effects on this species from project activities. The selection and shelterwood harvests methods proposed are compatible with preservation of marten habitat (WDNR, 1986). Management activities will be reassessed if this species is found within the MPA.

Conclusion: No impact.

7.1.14 Greater Redhorse (*Moxostoma valenciennesi*)

This fish species prefers clear waters of medium to large-sized rivers, reservoirs and large lakes at depths of less than 3 feet over sand, gravel or boulders. There has been no documentation of greater redhorse on the La/La RD and their habitat is very limited within the MPA (Risk Evaluation, 2002). None of the proposed activities would affect these habitats, therefore there would be no direct, indirect, or cumulative effects on this species from project activities. Management activities will be reassessed if this species is found within the MPA.

Conclusion: No impact.

7.1.15 Pugnose shiner (*Notropis nogenus)*

This fish species prefers clear, weedy shoals of glacial lakes and streams of low gradient, over sand, mud, gravel, or marl. Also key habitat component is its associated with aquatic plants, including pondweed, water milfoil, elodea, eelgrass, coontail, bulrush, and filamentous algae. There has been no documentation of pugnose shiner on the Nicolet NF (BE Reference, 2002) and their habitat is limited within the MPA. None of the proposed activities would affect these habitats, therefore there would be no direct, indirect, or cumulative effects on this species from project activities. Management activities will be reassessed if this species is found within the MPA.
Conclusion: No impact.

7.1.16 Extra-striped snaketail (*Ophiogomphus anomalus)*

This dragonfly species prefers high quality medium to large, free flowing and moderate gradient warm water rivers. Particularly in riffle areas of gravel, sand, or cobble. There has been no documentation of extra-striped snaktail on the Nicolet NF (BE Reference, 2002) and their habitat is limited within the MPA. None of the proposed activities would affect these habitats, therefore there would be no direct, indirect, or cumulative effects on this species from project activities. Management activities will be reassessed if this species is found within the MPA.
Conclusion: No impact.

7.1.17 Pygmy snaketail (*Ophiogomphus howei)*

This dragonfly species prefers medium to large, moderate gradient, free flowing rivers with good water quality. It also requires natural seasonal fluctuations of stream flow, watersheds that are 50-55% forested, and gravel bottoms with fast water (BE Reference, 2002). The pygmy snake tail has been documented on the LaLa RD but not within the MPA. Their habitat is limited within the MPA and none of the proposed activities would affect these habitats, therefore there would be no direct, indirect, or cumulative effects on this species from project activities. Management activities will be reassessed if this species is found within the MPA.
Conclusion: No impact.

7.1.18 Connecticut Warbler (*Oporornis agilis*)

This bird species prefers a fairly wide variety of forest types, including lowland conifer, bogs, jack pine, aspen parklands, and moist deciduous forest. In northern Wisconsin though, they are most often associated with lowland conifer and jack pine; there is a notable population centered in the jack pine belt in the northwest portion of the state. A well-developed shrub layer is considered by some to be the most important habitat feature for this bird (Kudell-Ekstrum, 2001). The NNF BBS has 15-recorded observations on both districts (11 on ER/FL and 4 La/La RD). Theses have occurred in a variety of habitats that include conifer lowland habitat types (northern white cedar, mixed swamp conifer, mixed black ash swamps) and jack pine. There was one observation within the MPA and there are no proposed harvest activities within or adjacent to this stand.
Pre-screening of potential habitat was done using criteria established by Forest biologists, and included factors such as stand age, type and structure. Approximately 107 acres of potential warbler habitat was identified within the MPA by GIS habitat analysis. There are no proposed harvest activities or road activities within these stands. However 3 stands (75 acres) had adjacent stands with a variety of proposed harvest treatments depending on alternative. The percentage of potential Connecticut warbler habitat that boarders these adjacent stands does not exceed 20%, thus the negative impacts to the habitat will be minimal and short term. Surveys conducted in June 2002 by UWGB students and in June 2002 by Forest Service biologist reported no birds in these stands. Since no birds were located and none of the proposed activities would cause these habitats to become unsuitable, there would be no direct, indirect, or cumulative effects on this species. Management activities will be reassessed if this species is found within any stand with proposed activities in the MPA.
Conclusion: No impact.

7.1.19 Tawny crescent spot (*Phyciodes batesii)*

This small butterfly ranges from New England, Ontario, and southern Quebec south to Georgia and west to Nebraska and the Dakotas (NPWRC, 2002). It is an extremely localized species that has apparently disappeared for unknown reasons from much of its eastern range. Its habitat use varies depending on location within its range. In the Midwest it is found in moist situations and in the Appalachians can be found in dry, rocky bluffs above rivers or rocky upland pastures (Nature Serve, 2002). In Wisconsin, populations have been found in northern part of the state primarily in jack pine areas such as the Moquah Barrens in Bayfield County and Waubee Lake area in Oconto County (WDNR, 2002c). The tawny crescent has a single generation of butterfly each year, with adults flying from early June through July. The eggs are laid in clusters under leaves of the host plant, most commonly an aster. Management for this species includes maintenance of open grasslands that include the host plant colonies, and nectar sources. Fire management within these areas is possible but there are concerns due to the butterfly having

only one generation per year and are then vulnerable during any period of the year. However, because the species is found in Wisconsin on asters in moist areas the butterflies may be protected from fire on that landscape. Within dry barrens mosaic landscapes their populations may be at risk due to isolation. Protection of asters in areas with tawny crescent is important to the survival of the butterflies due to its relationship as a possible host plant (WDNR, 2002c). The Waubee Lake area is 0.50 miles from the eastern boarder of the MPA and potential butterfly habitat was identified within the MPA. This habitat includes the same wildlife openings identified with the Northern blue butterfly analysis. Steve Janke, also conducted surveys at these locations for tawny crescents and found no presence of butterflies or unique characteristics that define their habitat. In summer of 2002, Matt Burst, Butterfly Specialist, CNNF Survey Contract, conducted butterfly surveys along FSRD # 2349, 2141 and 2673 within the MPA and FSRD # 2338, 2101 and 2102 and associated openings east of the MPA. He also reported no observations of tawny crescent butterflies.

Since no tawny crescent butterflies, large aster populations or appropriate habitats were located and none of the proposed activities would cause these habitats to become unsuitable, there would be no direct, indirect, or cumulative negative effects on this species. Management activities will be reassessed if these species are found within the MPA. Positive impacts to habitat may result at a 1.5 acres opening that is within a prescribed under burn unit as part of Alternatives 2,4, and 5. The burn would remove brush and grass that may allow host plants and than butterflies to become established.

Conclusion: Beneficial impacts from prescribed burn developing potential habitat.

7.1.20 Black-backed woodpecker (*Picoides arcticus*)

This bird species is considered an irruptive species and prefers decadent jack pine, balsam fir, tamarack, cedar, and black spruce stands (disease or wind throw) for foraging and nesting sites. It is typically found at low densities, although it may be common in large areas of suitable habitat. There have been two observations recorded in the NNF BBS and both were within the ER/FL RD. Potential habitat was identified within the MPA and surveys were conducted at these locations through a contract with UWGB in spring 2000 and no birds were identified. Since no birds were located and none of the proposed activities would cause these habitats to become unsuitable, there would be no direct, indirect, or cumulative effects on this species. Management activities will be reassessed if this species is found within the MPA.

Conclusion: No impact.

7.1.21 West Virginia white (*Pieris virginiensis*)

This butterfly preferred habitat is moist, shady, rich deciduous forest. Such habitat is common in the project area, with the most suitable habitat found north of the North Branch of the Oconto River. The West Virginia white butterfly is dependent on its host plant the toothwort (*Cardamine diphylla* and *C. concatenata*), which is the foodplant for the larval stage. The West Virginia white flight period is early spring, primarily during May and early June.Loss of the host plant would directly impact the West Virginia white. The host plant, toothwort, could be directly impacted by logging activities if equipment tramples, compacts the soil or otherwise disturbs the plant or possibly the larvae. Other potential impacts would include the accidental introduction of competing vegetation, especially aggressive non-native invasive plants such as garlic mustard (*Alliaria petiolata*). A late arriving spring can impact populations of the butterfly if it begins flying before toothwort emerges. Early flying individuals may have difficulty mating and laying eggs if the host plant is not yet above ground.

During the summer of 2000, Steve Janke conducted West Virginia white butterfly surveys incidental to plant surveys in northern hardwood stands in the project area and found no butterflies. In the summer of 2002, Matt Burst, Butterfly Specialist, under a CNNF Survey Contract, conducted butterfly surveys along FSRD # 2349, 2141 and 2673 within the MPA and FSRD # 2338, 2101 and 2102 and associated openings east of the MPA. He reported no observations of West Virginia white butterflies.Since no butterflies were located, and the northern hardwood forest habitat should remain suitable for toothwort, there would be no direct, indirect, or cumulative effects on this species. Management activities will be reassessed if this species is found within the MPA.

Conclusion: No impact.

7.1.22 Zebra clubtail (*Stylurus scudderi*)

This dragonfly species prefers cool, small trout streams with substantial amounts of sand substrate and is commonly found in the headwaters and also in spring-fed streams. The zebra clubtail has been documented on the La/La RD but not within the MPA. Their habitat is limited within the MPA and none of the proposed activities would affect these habitats, therefore there would be no direct, indirect, or cumulative effects on this species from project activities. Management activities will be reassessed if this species is found within the MPA.

Conclusion: No impact.

7.2 RFSS PLANTS

7.2.1 Missouri rock cress (*Arabis missouriensis*)

Missouri rock cress, a member of the mustard family, is typically found growing on dry-mesic soils with variable amounts of disturbance. It is often associated with bedrock glades and outcrops, bracken grassland, barrens, gravel bars, and other disturbance communities. It is known from several sites on both sides of the Forest, the majority of which are found on the Lakewood-Laona district. In the project area, this species was reported in mixed woods north of Spring Lake in 1982, but no known recorded observations have been made since that time. This species may move around as new habitat becomes available and former habitat becomes unsuitable. Thus, this species may no longer be present in the project area.

Missouri rock cress is generally found in dry, open areas that experience occasional disturbance. Management activities may assist in maintaining suitable habitat. Since it is not known to currently occur in the MPA and none of the proposed activities would cause these habitats to become unsuitable, there would be no direct, indirect, or cumulative effects on this species. Management activities will be reassessed if this species is again found within any stand with proposed activities in the MPA.
Conclusion: Minimal impact - positive.

7.2.2 Mingan's moonwort (*Botrychium minganense*)

Mingan's Moonwort grows in both open and shaded areas including meadows, lake and stream banks, and mixed hardwood forest, often closely associated with other *Botrychium* species in an assemblage referred to as a "genus community". In the project area, this species is known from one site, in Forest County near Knowles Creek. Suitable habitat in the project area appears to be restricted to thin soil on large rock outcrops.

A variety of limiting factors may affect the viability of Mingan's moonwort, these may include but are not limited to: unfavorable changes in soil characteristics (pH, structure, aeration, nutrients, mycorrhizal fungi, organic layer) due to exotic earthworms, forestry practices, and road building. Adverse micro-climatic changes resulting from drought, fire, timber harvest, herbicide use, herbivory, the introduction of exotic earthworms and succession.

Mitigation measures would be implemented at known and newly discovered locations to protect populations and habitat. Adverse impacts to this species are not expected as long as mitigation measures are implemented.

Alternative 1

Under this alternative, no federally initiated treatments would occur. Populations and/or habitat for Mingan's moonwort would continue to be affected by past actions or non-federally initiated actions. This alternative would be most favorable for this species because no new actions would occur, and disturbance within the project area would likely remain at about the same level as in the past.

Alternative 2-5

Suitable habitat for Mingan's moonwort is proposed for selection harvest under all four action alternatives. Individuals of this species could be directly impacted by harvest operations including: mechanical disturbance by logging equipment, slash disposal, and road construction and maintenance. Indirectly, individuals could be impacted by harvest activities due to habitat alteration including: loss of canopy cover, desiccation, soil compaction, competition due to increased light levels, and introduction of exotic earthworms and non-native invasive plant species.

Under the action alternatives, road construction or use could cause indirect effects to potential habitat by causing the spread of non-native invasive species seed and/or exotic earthworm eggs along the roadside. In addition, road corridors may fragment habitat and disrupt ecosystem processes at a range of landscape scales (Forman and Alexander 1998). Since these road corridors already exist for the most part, these indirect effects are presumably already present. The four action alternatives would be expected to have roughly the same effects on Mingan's moonwort.

Cumulative Effects:

Forest-wide, maturing hardwood forest continues to provide more available habitat for Mingan's moonwort. Conversely, forest-wide activities that occur each year such as timber harvest, road construction, trail use or expansion etc, cause disturbance of or act as vectors of change to habitat characteristics that are important for this

species. These changes may be reversed over time as desirable habitat conditions are restored (e.g. when the tree canopy cover returns to pre-disturbance levels). In some instances, changes may be irreversible (e.g. exotic earthworm invasion). Overall, populations of this species are likely to follow recent patterns.
Conclusion: No impact.

7.2.3 Goblin Fern (*Botrychium mormo*)

Goblin fern is a State Endangered fern that occurs under the full shade of northern hardwood forest dominated by sugar maple and basswood. Basswood appears to be an important component in the goblin fern's life cycle (mycorrhizal relationship?) as is microhabitat (cradle-knoll topography, ephemeral ponds, etc.) As is true with many *Botrychium* species, it is often closely associated with other *Botrychium* species in an assemblage referred to as a "genus community". Although it can be found throughout the summer and into the fall, late June through late August appears to be the best time for survey. In the project area, this species is known from several sites, all north of the North Branch of the Oconto River in rich, northern hardwood forests.

A variety of limiting factors may affect the viability of Goblin fern, these may include but are not limited to: unfavorable changes in soil characteristics (pH, structure, aeration, nutrients, mycorrhizal fungi, organic layer) due to exotic earthworms, forestry practices, and road building, changes in microclimate due to loss of canopy, and inhibition of spore dispersal (USDA Forest Service 2001).

Mitigation measures would be implemented at known and newly discovered locations to protect populations and habitat. Adverse impacts to this species are not expected as long as mitigation measures are implemented.

Alternative 1

Under this alternative, no federally initiated treatments would occur. Populations and/or habitat for Goblin fern would continue to be affected by past actions or non-federally initiated actions. This alternative would be most favorable for this species because no new actions would occur, and disturbance within the project area would likely remain at about the same level as in the past.

Alternative 2-5

Suitable habitat for Goblin fern is proposed for selection harvest under all four action alternatives. Individuals of this species could be directly impacted by harvest operations including: mechanical disturbance by logging equipment, slash disposal, and road construction and maintenance. Indirectly, individuals could be impacted by harvest activities due to habitat alteration including: loss of canopy cover, desiccation, soil compaction, competition due to increased light levels, and introduction of exotic earthworms and non-native invasive plant species.

Under the action alternatives, road construction or use could cause indirect effects to potential habitat by causing the spread of non-native invasive species seed and/or exotic earthworm eggs along the roadside. In addition, road corridors may fragment habitat and disrupt ecosystem processes at a range of landscape scales (Forman and Alexander 1998). Since these road corridors already exist for the most part, these indirect effects are presumably already present. The four action alternatives would be expected to have roughly the same effects on this species.

Cumulative Effects

Forest-wide, maturing hardwood forest continues to provide more available habitat for this species. Conversely, forest-wide activities that occur each year such as timber harvest, road construction, trail use or expansion etc, cause disturbance of or act as vectors of change to habitat characteristics that are important for this species. These changes may be reversed over time as desirable habitat conditions are restored (e.g. when the tree canopy cover returns to pre-disturbance levels). In some instances, changes may be irreversible (e.g. exotic earthworm invasion). Exotic earthworms may be a potentially significant threat to Goblin fern, which appears dependent on a thick duff layer (USDA Forest Service 2001).
Conclusion: May impact individuals but not likely to cause a trend towards federal listing or loss of viability.

7.2.4 Blunt-lobed grapefern (*Botrychium oneidense*)

Blunt-lobed grape fern occurs in northern hardwood forests, often at the edges of seasonally wet areas. It is also found in low, wet shady woods and swamps including the edges of woodland ephemeral ponds and transitional zones between upland and lowland forest. It is readily identifiable throughout the summer growing season and into the fall and is often closely associated with other *Botrychium* species in an assemblage referred to as a "genus

community". In the project area, this species is known from four sites, all north of the North Branch of the Oconto River.

A variety of limiting factors may affect the viability of Blunt-lobed grapefern, these may include but are not limited to: adverse micro-climatic changes resulting from drought, fire, timber harvest, herbicide use, herbivory, the introduction of exotic earthworms and succession. Other limiting conditions may include scientific or hobby collecting of individual plants (PVA, 2000).

Mitigation measures would be implemented at known and newly discovered locations to protect populations and habitat. Adverse impacts to this species are not expected as long as mitigation measures are implemented.

Alternative 1

Under this alternative, no federally initiated treatments would occur. Populations and/or habitat for Blunt-lobed grapefern would continue to be affected by past actions or non-federally initiated actions. This alternative would be most favorable for this species because no new actions would occur, and disturbance within the project area would likely remain at about the same level as in the past.

Alternative 2-5

Suitable habitat for Blunt-lobed grapefern is proposed for selection harvest under all four action alternatives. Individuals of this species could be directly impacted by harvest operations including: mechanical disturbance by logging equipment, slash disposal, and road construction and maintenance. Indirectly, individuals could be impacted by harvest activities due to habitat alteration including: loss of canopy cover, desiccation, soil compaction, competition due to increased light levels, and introduction of exotic earthworms and non-native invasive plant species.

Under the action alternatives, road construction or use could cause indirect effects to potential habitat by causing the spread of non-native invasive species seed and/or exotic earthworm eggs along the roadside. In addition, road corridors may fragment habitat and disrupt ecosystem processes at a range of landscape scales (Forman and Alexander 1998). Since these road corridors already exist for the most part, these indirect effects are presumably already present. The four action alternatives would be expected to have roughly the same effects on this species.

Cumulative Effects

Forest-wide, maturing hardwood forest continues to provide more available habitat for Blunt-lobed grapefern. Conversely, forest-wide activities that occur each year such as timber harvest, road construction, trail use or expansion etc, cause disturbance of or act as vectors of change to habitat characteristics that are important for this species. These changes may be reversed over time as desirable habitat conditions are restored (e.g. when the tree canopy cover returns to pre-disturbance levels). In some instances, changes may be irreversible (e.g. exotic earthworm invasion). Overall, populations of this species are likely to follow recent patterns.
Conclusion: May impact individuals but not likely to cause a trend towards federal listing or loss of viability.

7.2.5 Assiniboine sedge (*Carex assiniboinensis*)

Assiniboine sedge occurs in rich, mesic hardwood forest including floodplains. Identification is easiest during the peak summer months of June and July, although if this plants stolons are well developed, it is identifiable into the early autumn. The project area does contain suitable habitat for this species. Stoloniferous sedge is known from several sites on the Forest, the closest being approximately 20 miles to the northwest.

A variety of limiting factors may affect the viability of Assiniboine sedge, these may include but are not limited to: adverse micro-climatic changes resulting from drought, fire, timber harvest, herbicide use, herbivory, the introduction of exotic earthworms and non-native invasive species such as garlic mustard (*Alliaria petiolata*).

Alternative 1

Under this alternative, no federally initiated treatments would occur. Populations and/or habitat for Assiniboine sedge would continue to be affected by past actions or non-federally initiated actions. This alternative would be most favorable for this species because no new actions would occur, and disturbance within the project area would likely remain at about the same level as in the past.

Alternative 2-5

Suitable habitat for Assiniboine sedge is proposed for selection harvest under all four action alternatives. Individuals of this species could be directly impacted by harvest operations including: mechanical disturbance by logging equipment, slash disposal, and road construction and maintenance. Indirectly, individuals could be impacted by harvest activities due to habitat alteration including: loss of canopy cover, desiccation, soil compaction, competition due to increased light levels, and introduction of exotic earthworms and non-native invasive plant species.

Under the action alternatives, road construction or use could cause indirect effects to potential habitat by causing the spread of non-native invasive species seed and/or exotic earthworm eggs along the roadside. In addition, road corridors may fragment habitat and disrupt ecosystem processes at a range of landscape scales (Forman and Alexander 1998). Since these road corridors already exist for the most part, these indirect effects are presumably already present. The four action alternatives would be expected to have roughly the same effects on this species if it were to be found in the project area.

Cumulative Effects

Forest-wide, maturing hardwood forest continues to provide more available habitat for Assiniboine sedge. Conversely, forest-wide activities that occur each year such as timber harvest, road construction, trail use or expansion etc, cause disturbance of or act as vectors of change to habitat characteristics that are important for this species. These changes may be reversed over time as desirable habitat conditions are restored (e.g. when the tree canopy cover returns to pre-disturbance levels). In some instances, changes may be irreversible (e.g. exotic earthworm invasion). Management activities will be reassessed if this species is found within any stand with proposed activities in the MPA.
Conclusion: No impact.

7.2.6 Rocky Mountain sedge (*Carex backii*)

Rocky Mountain sedge is found growing in cool sandy mixed woods, rock outcrops, and cliffs. It is known from two sites on the Nicolet side of the Forest. The project area does contain suitable habitat for this species. The closest site to the project area is 8 miles to the southeast.

In the project area, this species is likely to occur in dry somewhat open, rocky areas, especially around large rock outcrops. Such areas are unlikely to be directly impacted by management activities. Since it is not known to currently occur in the MPA and none of the proposed activities would cause potential habitats to become unsuitable, there would be no direct, indirect, or cumulative effects on this species. Management activities will be reassessed if this species is found within any stand with proposed activities in the MPA.
Conclusion: No impact.

7.2.7 Northern wild comfrey (*Cynoglossum virginianum var. boreale*)

Northern wild comfrey is typically found growing on loamy-sand soils under sparse to moderate forest canopy of pine or pine mixed with red oak, paper birch and aspen, or in small natural forest openings. It blooms during the early summer but can readily be identified through early September. In the project area, this species was observed in mixed woods south of Bluegill Lake in 1982, but no known recorded observations have been made since that time. This species may move around as new habitat becomes available and former habitat becomes unsuitable. Thus, this species may no longer be present in the project area.

A variety of limiting factors may affect the viability of Northern wild comfrey, these may include but are not limited to: adverse micro-climatic changes resulting from drought, fire, timber harvest, herbicide use, herbivory, and succession.

Northern wild comfrey is generally found in dry, sparsely canopied woods, and management activities may assist in maintaining suitable habitat. Since it is not known to currently occur in the MPA and none of the proposed activities would cause these habitats to become unsuitable, there would be no direct, indirect, or cumulative effects on this species. Management activities will be reassessed if this species is again found within any stand with proposed activities in the MPA.
Conclusion: No impact.

7.2.8 Butternut

Butternut is present in the analysis area but only as a minor and scattered component on the richer mesic sites. Butternut is a very shade intolerant species and is short-lived, usually less than 100 years (Rink, 1990). Most butternuts within the McCaslin area regenerated after the initial logging at the turn of the century. They are now 70 to 80 years old and considered mature. Butternut is extremely susceptible to a highly virulent exotic fungal disease called butternut canker (*Sirococcus clavigignenti-juglandacearum*) that has infected a large percentage of butternut throughout its natural range. Once infected, the tree almost always dies. Wisconsin currently has the most butternut of all the states in its natural range and the south half of the Nicolet portion of the forest has the highest concentration in the state.

In accordance with recommendations from the Scientific Roundtable on Biological Diversity, efforts are currently underway to identify butternut phenotypes that display potential resistance to the disease. In addition, because of the tree's relatively short life span, managers are attempting to regenerate butternut trees before the parent trees die in order to maintain existing genetic resources. Researchers from the Northeast Area State and Private Forestry office and Forest Service managers are conducting research on an area located about 10 miles northwest of this analysis area. Because of its shade intolerance, butternut regeneration must become established in sparse shade or open canopy conditions if it is to survive and grow to maturity. The research has centered on this characteristic of butternut. Preliminary findings indicate that butternut regenerates best under about 30% crown closure. Treatment proposed around existing butternut in the McCaslin analysis area would be guided by the research findings.

Alternative 1

In the short term, there would be no anticipated change in the presence of butternut within the project area. In the long term, a steady decrease in butternut would be expected. Butternut is a short-lived, shade intolerant species. Without some sort of regular disturbance that creates canopy gaps, butternut would not be able to regenerate and survive.

Alternatives 2-5

The action alternatives all propose varying amounts of overstory thinning to create conditions that would be conducive to butternut establishment. In areas with a butternut seed source, this would be done mainly through the creation of canopy gaps or by thinning overstory patches to reduced crown closures. In the short term, this would increase the likelihood of natural butternut regeneration in the McCaslin Project Area. It would allow germination and improved survival of butternut seedlings. Without some similar type of disturbance, butternut would not be able to regenerate and survive and would steadily disappear from the area. Mitigation measures to promote butternut regeneration would be implemented across all action alternatives.Direct and indirect effects would be very similar across action alternatives.

Cumulative Effects

Cumulative effects on butternut would act in two directions. Management activities would promote regeneration to sustain the species and butternut canker will continue to kill adult individuals.
Conclusion: Beneficial impact.

7.2.9 Indian cucumber-root (*Medeola virginiana*)

Indian cucumber-root is closely associated with the range of American beech (*Fagus grandifolia*) in Wisconsin. It prefers rich, mesic maple-beech forest with a full canopy although it is also found in wet woods including mixed swamp conifer and transitional zones. Indian cucumber-root is only found on the Lakewood-Laona Ranger District and is not expected much further west than the Oconto-Langlade County line. Several populations are found in the McCaslin Mountain RNA, which is permanently protected from future management activities.

Mitigation measures would be implemented at known and newly discovered locations to protect populations and habitat. Adverse impacts to this species are not expected as long as mitigation measures are implemented.

Alternative 1

Under this alternative, no federally initiated treatments would occur. Populations and/or habitat for this species would continue to be affected by past actions or non-federally initiated actions. This alternative would be most favorable for this species because no new actions would occur, and disturbance within the project area would likely remain at about the same level as in the past.

Alternative 2-5

Suitable habitat for Indian cucumber-root is proposed for thinning or selection harvest under all four action alternatives. Individuals of this species could be directly impacted by harvest operations including: mechanical disturbance by logging equipment, slash disposal, and road construction and maintenance. Indirectly, individuals could be impacted by harvest activities due to habitat alteration including: loss of canopy cover, desiccation, soil compaction, competition due to increased light levels, and introduction of exotic earthworms and non-native invasive plant species.

Under the action alternatives, road construction or use could cause indirect effects to potential habitat by causing the spread of non-native invasive species seed and/or exotic earthworm eggs along the roadside. In addition, road corridors may fragment habitat and disrupt ecosystem processes at a range of landscape scales (Forman and Alexander 1998). Since these road corridors already exist for the most part, these indirect effects are presumably already present. The four action alternatives would be expected to have roughly the same effects on this species.

Cumulative Effects

Forest-wide, maturing hardwood forest continues to provide more available habitat for Indian cucumber-root. Conversely, forest-wide activities that occur each year such as timber harvest, road construction, trail use or expansion etc, cause disturbance of or act as vectors of change to habitat characteristics that are important for this species. These changes may be reversed over time as desirable habitat conditions are restored (e.g. when the tree canopy cover returns to pre-disturbance levels). Overall, populations of this species are likely to follow recent patterns.
Conclusion: No impact.

7.2.10 American ginseng (*Panax quinquefolius*)

American ginseng grows in rich loamy soils under the full shade of mixed northern hardwood forest often dominated by sugar maple and basswood. Ginseng blooms early in the summer and can easily be identified through September by its deep red fruit. In the project area, this species is known from several locations, all north of the North Branch of the Oconto River in rich northern hardwood stands.

A variety of limiting factors may affect the viability of American ginseng, these may include but are not limited to: illegal collection as well as modification or removal of canopy cover below 80% (PVA, 2000).

Mitigation measures would be implemented at known and newly discovered locations to protect populations and habitat. Adverse impacts to this species are not expected as long as mitigation measures are implemented.

Alternative 1

Under this alternative, no federally initiated treatments would occur. Populations and/or habitat for this species would continue to be affected by past actions or non-federally initiated actions. This alternative would be most favorable for this species because no new actions would occur, and disturbance within the project area would likely remain at about the same level as in the past.

Alternative 2-5

Suitable habitat for American ginseng is proposed for selection harvest under all four action alternatives. Individuals of this species could be directly impacted by harvest operations including: mechanical disturbance by logging equipment, slash disposal, and road construction and maintenance. Indirectly, individuals could be impacted by harvest activities due to habitat alteration including: loss of canopy cover, desiccation, soil compaction, competition due to increased light levels, and introduction of exotic earthworms and non-native invasive plant species.

Under the action alternatives, road construction or use could cause indirect effects to potential habitat by causing the spread of non-native invasive species seed and/or exotic earthworm eggs along the roadside. In addition, road corridors may fragment habitat and disrupt ecosystem processes at a range of landscape scales (Forman and Alexander 1998). Since these road corridors already exist for the most part, these indirect effects are presumably already present. The four action alternatives would be expected to have roughly the same effects on this species.

Cumulative Effects

Forest-wide, maturing hardwood forest continues to provide more available habitat for American ginseng. Conversely, forest-wide activities that occur each year such as timber harvest, road construction, trail use or expansion etc, cause disturbance of or act as vectors of change to habitat characteristics that are important for this species. These changes may be reversed over time as desirable habitat conditions are restored (e.g. when the tree canopy cover returns to pre-disturbance levels). In some instances, changes may be irreversible (e.g. exotic earthworm invasion). Overall, populations of this species are likely to follow recent patterns.
Conclusion: May impact individuals but not likely to cause a trend towards federal listing or loss of viability.

7.2.11 Braun's holly fern (*Polystichum braunii*)

Braun's holly fern occurs under the full shade of mixed northern hardwood forest in the close proximity of exposed bedrock or talus and high moisture (running water, seeps, etc.). It can be identified from late May through late autumn. In the project area, this species is found at one location along Knowles Creek in a steep rocky ravine. All known suitable habitat in the project area has been surveyed and no other populations are likely to occur.

Mitigation measures would be implemented at the known location to protect the population and habitat. Adverse impacts to this species are not expected as long as mitigation measures are implemented.

Alternative 1

Under this alternative, no federally initiated treatments would occur. Populations and/or habitat for Braun's holly fern would continue to be affected by past actions or non-federally initiated actions. This alternative would be most favorable for this species because no new actions would occur, and disturbance within the project area would likely remain at about the same level as in the past.

Alternative 2-5

Steep rocky streams are of limited extent in the project area and management activities generally avoid these areas. However, unknown populations of Braun's holly fern could be directly impacted by harvest operations including: mechanical disturbance by logging equipment, slash disposal, and road construction and maintenance. Indirectly, individuals could be impacted by harvest activities due to habitat alteration including: loss of canopy cover, desiccation, soil compaction, competition due to increased light levels, and introduction of exotic earthworms and non-native invasive plant species.

Under the action alternatives, road construction or use could cause indirect effects to potential habitat by causing the spread of non-native invasive species seed and/or exotic earthworm eggs along the roadside. In addition, road corridors may fragment habitat and disrupt ecosystem processes at a range of landscape scales (Forman and Alexander 1998). Since these road corridors already exist for the most part, these indirect effects are presumably already present. The four action alternatives would be expected to have roughly the same effects on this species.

Cumulative Effects

Forest-wide, maturing hardwood forest continues to provide more available habitat for Braun's holly fern. Conversely, forest-wide activities that occur each year such as timber harvest, road construction, trail use or expansion etc, cause disturbance of or act as vectors of change to habitat characteristics that are important for this species. These changes may be reversed over time as desirable habitat conditions are restored (e.g. when the tree canopy cover returns to pre-disturbance levels). In some instances, changes may be irreversible (e.g. exotic earthworm invasion).
Conclusion: No impact.

7.2.12 Foamflower (*Tiarella cordifolia*)

Heart-leaved foamflower a State Endangered member of the Saxifrage family, is found growing in deciduous or mixed forest, often in wet hollows or springy places. Wisconsin, at the western edge of foamflowers range, has three known sites including one on the Lakewood-Laona Ranger District. Given this species known habitat and range, surveys should probably be restricted to the Nicolet side of the Forest. The closest site to the project area is 2 miles to the west. The project area does contain suitable habitat for this State Threatened species.

Alternative 1

Under this alternative, no federally initiated treatments would occur. Populations and/or habitat for Heart-leaved foamflower would continue to be affected by past actions or non-federally initiated actions. This alternative would be most favorable for this species because no new actions would occur, and disturbance within the project area would likely remain at about the same level as in the past.

Alternative 2-5

Suitable habitat for Heart-leaved foamflower is proposed for selection harvest under all four action alternatives. Individuals of this species could be directly impacted by harvest operations including: mechanical disturbance by logging equipment, slash disposal, and road construction and maintenance. Indirectly, individuals could be impacted by harvest activities due to habitat alteration including: loss of canopy cover, desiccation, soil compaction, competition due to increased light levels, and introduction of exotic earthworms and non-native invasive plant species.

Under the action alternatives, road construction or use could cause indirect effects to potential habitat by causing the spread of non-native invasive species seed and/or exotic earthworm eggs along the roadside. In addition, road corridors may fragment habitat and disrupt ecosystem processes at a range of landscape scales (Forman and Alexander 1998). Since these road corridors already exist for the most part, these indirect effects are presumably already present. The four action alternatives would be expected to have roughly the same effects on this species were it to be found in the project area.

Cumulative Effects

Forest-wide, maturing hardwood forest continues to provide more available habitat for Heart-leaved foamflower. Conversely, forest-wide activities that occur each year such as timber harvest, road construction, trail use or expansion etc, cause disturbance of or act as vectors of change to habitat characteristics that are important for this species. These changes may be reversed over time as desirable habitat conditions are restored (e.g. when the tree canopy cover returns to pre-disturbance levels). In some instances, changes may be irreversible (e.g. exotic earthworm invasion). Management activities will be reassessed if this species is found within any stand with proposed activities in the MPA.
Conclusion: No impact.

7.2.13 American elm (*Ulmus americana*)

American elm is typically found in swamp forests such as river floodplains, and in rich upland hardwoods, especially somewhat poorly drained areas. Individuals are found scattered throughout the project area. American elm has lost its prominence in North American forests after the introduction of Dutch elm disease fungus (*Ophiostoma ulmi* or *Ophiostoma novo-ulmi*). Most trees over its range were lost in the 1970's, and on the Forest, salvage harvests were initiated in the 1980's. American elm continues to regenerate, but individuals typically are killed by the disease before reaching maturity.

Mitigation measures would be implemented to protect seed sources. Adverse impacts to this species from management are not expected as long as mitigation measures are implemented.

Alternative 1

Under this alternative, no federally initiated treatments would occur. Populations and/or habitat for American elm would continue to be affected by past actions or non-federally initiated actions. This alternative would be most favorable for this species because no new actions would occur, and disturbance within the project area would likely remain at about the same level as in the past.

Alternatives 2-5

All four action alternatives would be expected to have similar effects on American elm populations. Some seedling and sapling individuals may be impacted by harvest activities, but the species will continue to regenerate, and maturing trees will continue to be impacted by the disease. Resistant individuals may increase in numbers over time.

Cumulative Effects
Management activities would continue to promote regeneration to sustain the species, although some young individuals may be impacted during harvest and road maintenance activities. Dutch Elm disease will continue to cause mortality among maturing elm trees.
Conclusion: May impact individuals but not likely to cause a trend towards federal listing or loss of viability.

7.2.14 Dwarf bilberry (*Vaccinium caespitosum*)

Dwarf bilberry a rare member of the Heath family, is found in sandy and gravelly openings in dry pine-oak woodland and barrens, sandy old-field swales, and in rock crevices near rivers. It is adapted to fire and may require periodic fire to lessen competition of other plants including overstory trees. Dwarf bilberry is the only known host plant for the larval stage of the State Endangered and RFSS Northern blue butterfly (*Lycaeides idas nabokovi*). In Wisconsin, dwarf bilberry is primarily found in the northeastern counties of Florence, Marinette, and Oconto including sites on the Lakewood-Laona Ranger District. It has also been found in several central Wisconsin sites as well as across northern Minnesota. The closest site to the project area is located adjacent to the extreme eastern edge of the project boundary. The project area does contain suitable habitat for this State Endangered species. Potentially suitable habitat for Dwarf bilberry and Northern blue butterfly was surveyed and no populations were found.

Since no populations were located and none of the proposed activities would cause its habitat to become unsuitable, there would be no negative direct, indirect, or cumulative effects on this species. Positive impacts to habitat may result at a 1.5 acres opening that is within a prescribed under burn unit as part of Alternative 2,4, and 5. The burn would remove brush and grass that may allow host plants to become established. Management activities will be reassessed if this species is found within the MPA.
Conclusion: Beneficial impacts from prescribed burn developing potential habitat.

8.0 DETERMINATION

Relative to RFSS, the BE must arrive at a finding of effects on each species population viability. The finding must be 1 of the 3 following statements: 1) “no impact” (which may include beneficial impacts), 2) “may impact individuals of a species but not likely to cause a trend to federal listing or a loss or viability”, or 3) “likely to result in a trend to federal listing or loss of viability”. If any listed animals or plant species are found at a later date or, if any new information relevant to potential effects of the project on these species becomes available, then the project would be stopped and the status of the species would be re-evaluated in the project area.

8.1 RFSS WILDLIFE

Alternative 1 (No Action) would have no effect on any RFSS. Thus, Alternative 1 would not be expected to cause a trend towards federal listing of any of these species, nor is it expected to result in loss of population viability of any of these species. Alternatives 2-5 may impact individuals but would not likely cause a trend to federal listing of the following species: goshawks, red-shouldered hawks, cerulean warbler, and Swainson’s thrush.

8.2 RFSS PLANTS

Alternative 1 (No Action) would have no effect on any RFSS. Thus, Alternative 1 would not be expected to cause a trend towards federal listing of any of these species, nor is it expected to result in loss of population viability of any of these species. Alternatives 2-5 may impact individuals but would not likely cause a trend to federal listing of the following species: Goblin fern, Blunt-lobed grapefern, and American ginseng.

9.0 MITIGATION MEASURES

1. Standard and Guidelines from the 1986 Forest Plan for Goshawk and Red-shouldered hawk nest sites.

Standards:

- Identify territories or stands for active and historic nest sites with a minimum size of 20 acres. This area may be larger to retain territory productivity and to include adjacent historic territories in high quality habitat. All land use activities will be excluded except those necessary to protect active and/or historic nest sites for as long as the stand is suitable habitat.

- Do not clearcut adjacent stands within a minimum of 300 feet of the designated territory.

- Forest Service roads and trails within 300 feet of a nest site will normally be closed to vehicular traffic or relocated from February 15 to August 1. This requirement may be waived if no feasible alternatives exist and use can be justified.

Guidelines:

- Within high quality northern goshawk or red-shouldered hawk habitat (determined by a wildlife biologist), silvicultural practices will emphasize higher residual basal areas and smaller size and number of canopy gaps (compared to normal practices).

- Conduct surveys for these hawk species prior to projects being implemented within potential habitat areas.

- Maintain, protect, and enlarge areas of mature hardwood/hemlock/white pine forest with an emphasis on low fragmentation and contiguous canopy cover (minimum 80% canopy cover).

- Minimize human disturbance within the designated territory between February 15 and August 1.

2. Activities which could disturb goblin fern (*Botrychium mormo*), Blunt-lobed grapefern (*Botrychium oneidense*), Mingan's moonwort (*Botrychium minganense*) and Braun's holly fern (*Polystichum braunii*) plants, would not occur within 250 feet. The extent of plant populations will be determined by a Botanist, Biologist, Ecologist, or other qualified observers (technicians or contractors) designated by a Botanist, Biologist, or Ecologist.

3. In suitable habitat that extends beyond a 250 foot no-activity zone surrounding a Goblin fern (*B. mormo*), Blunt-lobed grapefern (*Botrychium oneidense*), Mingan's moonwort (*Botrychium minganense*) or Braun's holly fern (*Polystichum braunii*) population, site disturbing activities would occur only during frozen ground conditions, and a minimum canopy closure of 70% would be maintained. The extent of suitable habitat would be identified by a botanist, biologist, ecologist, or another qualified observer.

4. To conserve potentially disease-resistant butternut trees, the following guidelines would be used: 1) Trees with more than 70% live crown and with less than 20% circumference of the stem and root flares affected by butternut canker would be retained; 2) Dead or declining trees may be salvaged or retained for wildlife values (depending on condition of wood); 3) Butternut trees free of cankers with at least 50% live crown that are growing among diseased trees would be retained. These trees may be canker resistant and have value for propagation by grafting or for future breeding.

5. To protect future seed sources of American elms, this species would not be marked for harvest except for skidding, access, or safety reasons.

6. In suitable habitat surrounding Assiniboine sedge (*Carex assiniboinensis*), Indian cucumber-root (*Medeola virginiana*), and American ginseng (*Panax quinquefolius*) populations, site disturbing activities would occur only during frozen ground conditions, and a minimum canopy closure of 70% would be maintained. The extent of suitable habitat would be identified by a botanist, biologist, ecologist, or another qualified observer.

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11 BIOLOGICAL EVALUATION APPENDIX A - ADDITIONAL WILDLIFE INFORMATION

Table A1.Chequamegon-Nicolet National Forests Regional Foresters Sensitive Species (RFSS) status in McCaslin Project Area.

Scientific Name	Common Name	Global/State Rank*	LOO**	Potential Habitat
RFSS (Fauna)				
Accipiter gentiles	Northern goshawk	G5 S2N S2S3B SC	Confirmed	Yes
Acipenser fulvenscens	Lake sturgeon	G3 S3 SC	None	No
Ammodramus leconteii	LeConte's sparrow	G4 S2B SC	Minimal	Yes
Bartramia longicauda	Upland sandpiper	G5 S2B SC	Minimal	Yes
Buteo lineatus	Red-shouldered hawk	G5 S1N S3S4B ST	Confirmed	Yes
Catharus ustulatus	Swainson's thrush	G5 S2B SC	Probable	Yes
Chlidonia niger	Black tern	G4 S3B SC	Minimal	Yes
Clemmys insculpta	Wood turtle	G4 S3 ST	Minimal	Yes
Cygnus buccinator	Trumpeter swan	G4 S1B SE	Minimal	Yes
Dendroica cerulea	Cerulean warbler	G4 S2S3B ST	Confirmed	Yes
Falcipennis Canadensis	Spruce grouse	G5 S2B S1S2N ST	Minimal	No
Gomphus viridifrons	Green-faces clubtail	G3 S3 SC	Minimal	Yes
Incisalia henrici	Henry's elfin butterfly	G5 S2 SC	Minimal	Yes
Lycaeides idas nabokovi	Northern blue butterfly	G5 S1 SE	Confirmed	Yes
Martes Americana	American (pine) marten	G5 S3 SE	Minimal	Yes
Moxostoma valenciennesi	Greater redhorse	G3 S2S3 ST	Minimal	Yes
Myotis septentrionalis	Northern (long-eared) myotis	G4 S4 SC	None	No
Notropis nogenus	Pugnose shiner	G3 S2S3 ST	Minimal	Yes
Oeneis chryxus	Brown (chryxus) arctic	G5 S2 SC	None	No
Ophiogomphus anomalus	Extra-striped snaketail	G3 S1 SE	Minimal	Yes
Ophiogomphus howei	Pygmy snaketail	G3 S3 ST	Minimal	Yes
Oporornis agilis	Connecticut warbler	G4 S3B SC	Confirmed	Yes
Phyciodes batesii	Tawny crescent spot	G4 S3 SC	Minimal	Yes
Picoides arcticus	Black-backed woodpecker	G5 S2B SC	Minimal	Yes
Pieris virginiensis	West Virginia white	G4 S2 SC	Probable	Yes
Pipistrellus subflavus	Eastern pipistrelle bat	G5 S3S4 SC	None	No
Plethobasus cyphysus	Bullhead mussel	G2G3 S1 SE	None	No
Somatochlora forcipata	Forcipate emerald	G5 S2S3	None	No
Stylurus scudderi	Zebra clubtail	G3 G4 S3 SC	Minimal	Yes
Tympanuchus phasianellus	Sharp-tailed grouse	G4 S2 SC	None	No
RFSS (Flora)				
Amerorchis rotundifolia	Round-leaved orchis	G5 S2 ST	Minimal	Yes
Arabis missouriensis	Missouri rock cress	G5 S2 SC	Confirmed	Yes
Asplenium trichomanes-ramosum	Green spleenwort	G4 S1 SE	Minimal	Yes
Astragalus alpinus	Alpine milkvetch	G5 S1 SE	None	No
Botrychium minganense	Mingan's moonwort	G4 S2 SC	Confirmed	Yes
Botrychium mormo	Goblin fern	G3 S3 SE	Confirmed	Yes
Botrychium oneidense	Blunt-lobed grape-fern	G4Q S2 SC	Confirmed	Yes
Botrychium rugulosum	Ternate grape-fern	G3 S2 SC	Minimal	Yes
Callitriche hermaphroditica	Northern water-starwort	G5 S2 SC	None	No
Calypso bulbosa	Fairy slipper	G5 S3 ST	Minimal	Yes
Cardamine maxima	Large toothwort	G5 S1 SC	Minimal	Yes
Carex assiniboinensis	Assiniboine sedge	G4G5 S3 SC	Probable	Yes
Carex backii	Rocky Mountain Sedge	G4 S1 SC	Probable	Yes

Scientific Name	Common Name	Global/State Rank*	LOO**	Potential Habitat
Carex crawei	Crawe's sedge	G5 S3 SC	None	No
Carex gynocrates	Northern bog sedge	G5 S3 SC	Minimal	Yes
Carex lenticularis	Shore sedge	G5, S2, ST	None	No
Carex livida var radicaulis	Livid sedge	G5T5 S2 SC	None	No
Carex michauxiana	Michaux's sedge	G5 S2 ST	None	No
Carex sychnocephala	Many-headed sedge	G4 S2 SC	None	No
Carex vaginata	Sheathed sedge	G5 S3 SC	Minimal	Yes
Ceratophyllum echinatum	Spineless hornwort	G4? S2 SC	None	No
Cynoglossum virginianum var boreale	Northern wild comfrey	G5T4T5	Confirmed	Yes
Cypripedium arietinum	Ram's-head lady's-slipper	G3 S2 ST	Minimal	Yes
Diplazium pycnocarpon	Glade fern	G5 S2 SC	None	No
Disporum hookeri	Fairy bells, Hooker's mandarin	G5	None	No
Dryopteris expansa	Spreading wood fern	G5 S2 SC	Minimal	Yes
Dryopteris filix-mas	Male fern	G5 S1 SC	None	No
Dryopteris fragrans var remotiuscula	Fragrant fern	G5T? S3 SC	Minimal	Yes
Eleocharis engelmannii	Engelmann's spike-rush	G4G5Q, S2, SC	None	No
Eleocharis olivacea	Capitate spike-rush	G5 S2 SC	None	No
Eleocharis quinqueflora	Few-flowered spike-rush	G5 S2 SC	None	No
Epilobium palustre	Marsh willow-herb	G5 S3 SC	Minimal	Yes
Equisetum palustre	Marsh horsetail	G5 S2 SC	Minimal	Yes
Eriophorum chamissonis	Rusty cotton-grass	G5 S2 SC	None	No
Geum macrophyllum var macrophyllum	Large-leaved avens	G5T5 S1 SC	None	No
Juglans cinerea	Butternut	G3G4 S3? SC	Confirmed	Yes
Juncus stygius	Moor rush	G5 S1 SE	None	No
Leucophysalis grandiflora	Large-flowered ground-cherry	G4? S1 SC	None	No
Littorella uniflora	American shore-grass	G5 S2 SC	None	No
Listera auriculata	Auricled twayblade	G3 S1 SE	None	No
Listera convallarioides	Broad-leaved twayblade	G5 S1 ST	None	No
Malaxis brachypoda	White adder's-mouth	G4Q S3 SC	Minimal	Yes
Medeola virginiana	Indian cucumber-root	G5 S3 SC	Confirmed	Yes
Moehringia macrophylla	Large-leaved sandwort	G4, S1, SE	None	No
Myriophyllum farwellii	Farwell's water-milfoil	G5 S3 SC	None	No
Panax quinquefolius	American ginseng	G3G4 S4 SC	Confirmed	Yes
Parnassia palustris	Marsh grass-of-parnassus	G5 S1 ST	None	No
Petasites sagittatus	Arrow-leaved sweet colt's-foot	G5 S3 ST	None	No
Platanthera flava var herbiola	Pale-green orchid	G4T4Q S2 ST	None	No
Piptatherum canadense	Canada mountain rice-grass	G5, S1, SC	None	No
Poa paludigena	Bog bluegrass	G3 S3 ST	None	No
Polemonium occidentale var lacustre	Western Jacob's-ladder	G5?T1Q S1 SE	None	No
Polystichum braunii	Braun's holly fern	G5 S2 ST	Confirmed	Yes
Potamogeton confervoides	Algal-like pondweed	G4 S3 ST	Minimal	Yes
Potamogeton hillii	Hill's pondweed	G3 S1 SC	None	No
Potamogeton pulcher	Spotted pondweed	G5 S1 SE	None	No
Pterospora andromeda	Giant pinedrops	G5 S1 SE	None	No
Pyrola minor	Lesser wintergreen	G5 S1 SE	None	No

Scientific Name	Common Name	Global/State Rank*	LOO**	Potential Habitat
Ranunculus gmelinii	Small yellow water-crowfoot	G5 S2 SE	Minimal	Yes
Ranunculus lapponicus	Lapland buttercup	G5 S1 SE	None	No
Rhynchospora fusca	Brown beak-sedge	G4G5 S2 SC	None	No
Streptopus amplexifolius	White mandarin	G5 S3 SC	None	No
Tiarella cordifolia	Heart-leaved foam flower	G5 S1 SE	Probable	Yes
Ulmus americana	American elm	G5?	Confirmed	Yes
Vaccinium caespitosum	Dwarf bilberry	G5 S2 END	Confirmed	Yes
Valeriana uliginosa	Marsh valerian	G4Q S2 ST	None	No

* Global and State Ranking

Global Element Rank:
- G1 - Critically imperiled globally
- G2 - Imperiled globally
- G3 - Very rare and local throughout range
- G4 - Apparently globally secure, rare in parts of range
- G5 - Demonstrably secure globally, rare locally

Federal Status:
- FT - Federally threatened
- FE - Federally endangered
- FP - Federally proposed

State Element Rank:
- S1 - Critically imperiled
- S2 - Imperiled
- S3 - Rare or uncommon
- SA - Accidental
- SH - Historical occurrence
- S#B - Long-distance migrant, breeding status
- S#N - Long-distance migrant, non-breeding status

State Status:
- SE - State endangered
- ST - State threatened
- SC -State special concern

** Likelihood of occurrence

Confirmed = habitat is present; species has been observed within or near (within 0.25 miles) the project/proposed project area; a documented occurrence is on file for uncommon or rare species.

Probable = habitat is suitable; species has been documented on the Forest but not necessarily within project/proposed project area. Likelihood of occurrence is high. (Consideration is given to transient species such as eastern timber wolf.)

Minimal = some habitat exists; species may or may not have been documented on Forest. Likelihood of occurrence within the project area or proposed project area is low.

None = species may occur within region, but has no recent record of occurrence on the Nicolet National Forest, and/or habitat within the project area does not exist, or is not suitable.

Table A2. Species general habitat description and rational for inclusion or exclusion of RFSS.

Species	General Habitat Description	Inclusion or Exclusion	Impact
RFSS (Fauna)			
Northern Goshawk	Woodlands with intermediate canopy coverage interspersed with fields or wetlands. They prefer woodlands that consist of deciduous forests and northern maple-hemlock-pine stands that have interspersed canopy coverage with open areas for foraging.	Included, recorded obs/nesting.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Lake Sturgeon	Bottoms of large, clean warm water rivers and lakes. Inland populations prefer habitat in deep mid-river areas and pools where water depths vary between 12-30 feet and food is abundant.	Excluded, no habitat.	None
Le Conte's Sparrow	Moist grasslands, wet meadows, peripheries of wetlands, hay land, retired cropland, and native prairie.	Included, minimal habitat	None
Upland sandpiper	Large open grasslands, grasslands smaller than 30 ha. Optimum habitat is mixture of short grass areas and long grasses in areas larger than 150 acres. (RE 2002)	Included, minimal habitat.	None
Red-shouldered hawk	Bottomland hardwoods, mesic deciduous or mixed deciduous- conifer forests and wooded margins of marshes.	Included, recorded obs/nesting.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Swainson's thrush	Mature upland mixed deciduous /conifer forest and lowland conifer forest. The most important habitat factor appears to be a dense conifer understory, for nesting cover. (RE 2002)	Included, suitable habitat.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Wood Turtle	Semi-aquatic along forested rivers and streams. Spends most of the summer on land, but does not venture far from the river.	Included, minimal habitat.	None
Trumpeter Swan	An interspersion of open water and emergent marsh habitat in isolated areas away from human disturbance.	Included, minimal habitat.	None
Cerulean warbler	Generally considered to be mature deciduous forest, often in mesic or floodplain situations, large habitat patches for successful breeding, nests near or adjacent to small canopy gaps or forest openings.	Included, recorded observation.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Spruce Grouse	Spruce bogs, jack pine, and upland spruce/fir areas, with a preference for relatively undisturbed spruce/cedar/tamarack swamps.	Included, minimal habitat.	None
Green-faced clubtail	Warm water, medium (>100’), fast streams with fairly clean gravel/sand substrate. Found closer to shore and in fast current areas of streams. Is not found in big rivers or trout streams.	Included, minimal habitat.	None
Henrys (frosted) Elfin	Pine barrens, edges of boggy areas, forest edges, openings, clearings, brushy areas and forest roads or trails.	Excluded, no habitat.	None

Species	General Habitat Description	Inclusion or Exclusion	Impact
Northern blue butterfly	This butterfly requires open barrens conditions and is dependant on dwarf bilberry as a host plant, openings can be small	Included, confirmed observation.	None
American (pine) marten	Pine martens live in mature, dense conifer forests. They prefer woods with northern white cedar, balsam fir, spruce and eastern hemlock, especially where trees have fallen (WDNR TES).	Included, minimal habitat.	None
Greater Redhorse	Clear waters of medium to large-sized rivers, reservoirs and large lakes at depths of less than 3 feet over sand, gravel or boulders.	Included, minimal habitat.	None
Northern (long-eared) myotis bat	Associated with forested communities, especially older age riparian and bottomland forests, uses small gaps and openings for foraging. Snags and loose-barked trees are important for summer roosting, especially in close proximity to water (RE 2000).	Excluded, no habitat.	None
Pugnose Shiner	Clear, weedy shoals of glacial lakes and streams of low gradient, over sand, mud, gravel, or marl. Associated with aquatic plants, including pondweed, water milfoil, elodea, eelgrass, coontail, bulrush, and filamentous algae.	Included, minimal habitat.	None
Brown (Chryxus) arctic	Arctic and alpine tundra, open pine forest, open prairies, mountain meadows and sage flats (RE 2002).	Excluded, no habitat.	None
Extra-striped snaketail	Medium to large, free flowing, high water quality, moderate gradient warm water rivers. Particularly in riffle areas of gravel, sand, or cobble.	Included, minimal habitat.	None
Pygmy Snaketail	Medium to large, moderate gradient, free flowing rivers with good water quality.	Included, minimal habitat.	None
Connecticut Warbler	Predominately mature, lowland coniferous habitats (black spruce-tamarack bogs), and jack pine barrens with a thick shrub understory.	Included, recorded observation.	None
Tawny crescent spot	Populations have been found in northern part of WI, primarily in jack pine areas such as the Moquah Barrens in Bayfield County and Waubee Lake area in Oconto County.	Included, minimal habitat.	None
Black-backed woodpecker	Dense coniferous forests, especially in burned, swampy, cutover, or beetle-killed forests where dead trees are numerous.	Included, minimal habitat.	None
West Virginia white	Moist, shady, rich deciduous woods where toothwort, its larval host, can be found (RE 2002).	Included, suitable habitat.	None
Eastern pipistrelle	Partly open country with large trees, or woodland edges. Avoid deep woods and open fields. Presence of snags and hollow trees is important. Also, prefer hibernacula with stable moisture and temperature conditions (RE 2000)	Excluded, no habitat.	None
Bullhead mussel	Considered a large-river species, but also inhabits medium-sized rivers. Associated with riffles and gravel/cobble substrates but usually has been reported from deep water (>2 m) with slight to swift currents and mud, sand, or gravel bottoms (NS Web)	Excluded, no habitat.	None
Forcipate emerald	Habitat is bogs/acid peatlands or wetlands. Sphagnum is almost always present. species can't stand warm water temperatures – needs water cooled by shade or groundwater (RE 2000).	Excluded, no habitat.	None

Species	General Habitat Description	Inclusion or Exclusion	Impact
Zebra Clubtail	Medium to large, moderate gradient, free flowing rivers with good water quality.	Included, minimal habitat.	None
Sharp-tailed Grouse	Large (2000-10,000 ac.) areas of open/brush upland or bog habitat. Mixed prairie and parklands, open woodlands, brushlands, scrub and grasslands.	Excluded, no habitat.	None
Ellipse mussel	Generally not found in large rivers. Habitat is small to medium streams with gravel or mixed sand and gravel, with good current (RE 2002).	Excluded, no habitat.	None
RFSS (Flora)			
Round-leaved orchis	Cold balsam fir-white cedar-black spruce swamps, usually with underlying layers of marl.	Excluded, minimal habitat.	None
Missouri rock cress	Typically found growing on dry-mesic soils with variable amounts of disturbance. It is often associated with bedrock glades and outcrops, bracken grassland, barrens, gravel bars, and other disturbance communities.	Included, recorded observation.	None
Green spleenwort	Found growing on moist, calcareous, limestone bedrock with dense bryophyte cover under full canopy shade.	Excluded, minimal habitat.	None
Alpine milkvetch	Known from only one area in Wisconsin, is found on the Washburn Ranger District. It inhabits the sandy-gravelly shore of two neutral pH seepage lakes at about the high water mark.	Excluded, no habitat.	None
Mingan's moonwort	Grows in both open and shaded areas including meadows, lake and stream banks, and mixed hardwood forest.	Included, confirmed observation.	None
Goblin fern	Occurs under the full shade of northern hardwood forest dominated by sugar maple and basswood. Associated with a thick, spongy duff layer.	Included, confirmed observation.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Blunt-lobed grape-fern	Occurs in low, wet shady woods and swamps including the edges of woodland ephemeral ponds and transitional zones between upland and lowland forest.	Included, confirmed observation.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Ternate grape-fern	Found growing in open to semi-shaded areas in loamy-sand to sandy, acidic soils.	Excluded, minimal habitat.	None
Northern water-starwort	Found in shallow to deep waters of lakes and streams. On the Chequamegon-Nicolet, it has been found in a slightly alkaline flowage lake in <2 feet of water.	Excluded, no habitat.	None
Fairy slipper	Found growing in cool soils under old, undisturbed white cedar with full shade. It does not grow in soggy soils but rather prefers dryer islands within cedar swamps, often growing very close to the slightly raised areas surrounding cedar trunks.	Excluded, minimal habitat.	None
Large toothwort	Grows on extremely rich, silt-capped soils in mesic hardwood forests, often on flood plains.	Excluded, minimal habitat.	None
Assiniboine sedge	Occurs in rich, mesic hardwood forest including floodplains.	Included, suitable habitat.	None
Rocky Mountain Sedge	Found growing in cool sandy mixed woods, rock outcrops, and cliffs.	Included, suitable habitat.	None
Crawe's sedge	Grows on wet, sandy or mucky shores of calcareous lakes, and in wet meadows.	Excluded, no habitat.	None

Species	General Habitat Description	Inclusion or Exclusion	Impact
Shore sedge	Found growing along wet sandy shores of Lake Superior and inland lakes and rivers.	Excluded, no habitat.	None
Livid sedge	Found in open bogs, calcareous fens, and peaty shores, often in sphagnum.	Excluded, no habitat.	None
Michaux's sedge	Typically found in Wisconsin growing in sphagnum bogs associated with Lake Superior.	Excluded, no habitat.	None
Many-headed sedge	Found growing on wet sandy or mucky shores of receding lakes or rivers.	Excluded, no habitat.	None
Sheathed sedge	Found growing in mossy white cedar and mixed conifer swamp.	Excluded, minimal habitat.	None
Spineless hornwort	Found in slightly acidic, soft-water lakes and slow moving streams as well as pools in bogs or marshes.	Excluded, no habitat.	None
Northern wild comfrey	Typically found growing on loamy-sand soils under sparse to moderate forest canopy of pine or pine mixed with red oak, paper birch and aspen, or in small natural forest openings.	Included, recorded observation.	None
Ram's-head lady's-slipper	A plant of cool sub acid or neutral soils. On the Forest, it occurs in wet swamp conifer forest (mixed white cedar-balsam fir) and cool forest edges,	Included, minimal habitat.	None
Glade fern	A fern more closely associated with southern mesic forest south of the tension zone, has recently been found on the Medford unit of the Medford-Park Falls Ranger District. It grows on extremely rich, silt soils under the full shade of mesic hardwood forest.	Excluded, no habitat.	None
Fairy bells, Hooker's mandarin	It occurs under the full shade of upland mesic hemlock-hardwood forest in the western Upper Peninsula Michigan's Porcupine Mountains and Trap Hills.	Excluded, no habitat.	None
Spreading wood fern	Occurs under the full shade of mixed northern hardwood forest in the close proximity of exposed bedrock or talus, cool air drainage, and high moisture (running water, seeps, etc.).	Excluded, minimal habitat.	None
Male fern	Found in the Penokee-Gogebic Range of northern Wisconsin and western Upper Peninsula Michigan growing on dry, rocky, wooded slopes, often near the top of ridges.	Excluded, no habitat.	None
Fragrant fern	Typically found growing on shaded and open exposed bedrock cliffs or talus where there is cool airflow.	Excluded, minimal habitat.	None
Engelmann's spike-rush	Typically found on wet, mucky or sandy shores, peaty shores, exposed mud flats, and rarely bog mats.	Excluded, no habitat.	None
Capitate spike-rush	Found on sandy or muddy shores and bog mats surrounding lakes, usually in marly places, sometimes in several inches of water.	Excluded, no habitat.	None
Few-flowered spike-rush	Found on sandy or gravelly shores, and on bog mats surrounding lakes, usually in marly places and prefers a firm substrate.	Excluded, no habitat.	None
Marsh willow-herb	Found in open sphagnum bogs, edges of wet conifer swamp, and wet fen. This habitat is widespread and relatively undisturbed and is typically not directly impacted by management on the Forest.	Excluded, minimal habitat.	None
Marsh horsetail	Typically found growing along the wet edge of small streams, ponds, lakes and wetlands.	Excluded, minimal habitat.	None
Rusty cotton-grass	It typically is found growing in open, acidic bogs and is known from two sites on the Forest, both of which are on the Washburn Ranger District.	Excluded, no habitat.	None
Large-leaved avens	Typically found growing on dry-mesic, loamy sand soils along forest edges, in small openings, or along trails.	Excluded, no habitat.	None

Species	General Habitat Description	Inclusion or Exclusion	Impact
Butternut	Found growing on rich, loamy, well-drained soils as well as on drier, rocky soils when associated with limestone.	Included, confirmed observation.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Moor rush	Found on rich, calcareous fens or bogs in full sunlight.	Excluded, no habitat.	None
Large-flowered ground-cherry	Typically occurs in open sandy, gravelly or rocky disturbed areas including floodplains, old beaver meadows, or areas recently burned. It will usually survive in a site two to three years after a disturbance and then disappear.	Excluded, no habitat.	None
American shore-grass	Small, perennial, aquatic plant that occurs in sandy or mucky lakeshores and open water to over 1 meter deep. Lakes are typically soft water, low pH with low nutrient and dissolved carbon levels.	Excluded, no habitat.	None
Auricled twayblade	It is only found on raw, alluvial sand along creeks, rivers, and shoreline near the Great Lakes where it relies on cooler air and seasonal disturbance.	Excluded, no habitat.	None
Broad-leaved twayblade	Found growing near the base of steep slopes along swamp borders in seeps or in seepy ravines under hemlock-hardwood forest.	Excluded, no habitat.	None
White adder's-mouth	Inhabits cold, wet soils growing under mixed white cedar-balsam fir- black spruce, often at an ecotonal edge.	Excluded, minimal habitat.	None
Indian cucumber-root	Closely associated with the range of American beech (*Fagus grandifolia*) in Wisconsin. It prefers rich, mesic maple-beech forest with a full canopy although it is also found in wet woods including mixed swamp conifer and transitional zones.	Included, confirmed observation.	None
Large-leaved sandwort	Occurs mainly on dry, sheltered, rock outcrops, often in crevices under full to partial shade.	Excluded, no habitat.	None
Farwell's water-milfoil	Found in acidic ponds, lakes, and slow moving streams. It is known from several locations on the western portion of the Forest.	Excluded, no habitat.	None
American ginseng	Grows in rich loamy soils under the full shade of mixed northern hardwood forest often dominated by sugar maple and basswood.	Included, confirmed observation.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Marsh grass-of-parnassus	Circumboreal species that reaches its southeastern limit in Wisconsin and Michigan. It is found growing in calcareous fens and wet meadows, stream banks, shores, and near spring sources with moss ground cover.	Excluded, no habitat.	None
Arrow-leaved sweet colt's-foot	Early blooming member of the Aster family that is at the southern edge of its range in Wisconsin. Its habitat includes wet meadows, marshes, and shrub carr and often is found growing in several inches of water.	Excluded, no habitat.	None
Pale-green orchid	Primarily a southern plant that barely ranges north to the Chequamegon-Nicolet National Forest. Locally, it is known from open, moist prairie remnants along the Jump River in Taylor County just west of the Forest boundary and from a wet roadside in Ashland County (this population is no longer extant as of 2001). Elsewhere in its range, it is known from wet, swampy elm-ash, red maple, and white oak flatwoods where it grows near shallow pools in deep, matted leaf-litter.	Excluded, no habitat.	None

Species	General Habitat Description	Inclusion or Exclusion	Impact
Canada mountain rice-grass	Found growing under the sparse canopy of jack pine or mixed pine forest on sandy soils. Often, these soils have moisture near the surface or the site is on a north-facing slope where moisture levels stay a little higher.	Excluded, no habitat.	None
Bog bluegrass	Typically found growing in wet, springy black ash swamp, mixed swamp conifer, and transitional zones, often in sphagnum or other moss.	Excluded, no habitat.	None
Western Jacob's-ladder	Grows in relatively open, rich mixed white cedar, tamarack, and black spruce swamps. These areas have a continuous carpet of moss, typically sphagnum spp. and have neutral pH and water chemistry that suggests groundwater upwelling.	Excluded, no habitat.	None
Braun's holly fern	Occurs under the full shade of mixed northern hardwood forest in the close proximity of exposed bedrock or talus and high moisture (running water, seeps, etc.).	Included, confirmed observation.	None
Algal-like pondweed	Found in acidic, often dark-stained bog ponds and lakes including slow areas of streams that feed or flow from them.	Excluded, minimal habitat.	None
Hill's pondweed	Known from one site in Wisconsin, is found on the Eagle River-Florence Ranger District. Its habitat includes clear, cold, calcareous streams and beaver ponds.	Excluded, no habitat.	None
Spotted pondweed	Found growing in shallow to deep water of acidic lakes and embayments on rivers.	Excluded, no habitat.	None
Giant pinedrops	Typically found on sandy soils under pine with thick pine duff.	Excluded, no habitat.	None
Lesser wintergreen	Found growing in cold soils under boreal-like forest (balsam fir-white cedar-spruce), transitional zones, and at the edge of alder thickets.	Excluded, no habitat.	None
Small yellow water-crowfoot	A circumboreal species that reaches its southern limit in Wisconsin. It is found growing in a variety of wet sites including edges of rivers, streams, lakes, and ponds (both in standing water and on banks), pools in bogs, and white cedar swamps.	Excluded, minimal habitat.	None
Lapland buttercup	A circumboreal species that barely reaches to the southern shore of Lake Superior and was only recently (late 1990's) found in Wisconsin. It typically inhabits cool, wet to wet-mesic white cedar forest.	Excluded, no habitat.	None
Brown beak-sedge	Found on sandy-peaty shores, marly fens, and less commonly on bog mats.	Excluded, no habitat.	None
White mandarin	Found growing in mesic, shaded forest. In Wisconsin, it is restricted to Bayfield and Ashland Counties and on the Forest is restricted to the Penokee-Gogebic Range in areas that naturally reduce or limit white-tailed deer herbivory (cliffs, talus, etc.).	Excluded, no habitat.	None
Heart-leaved foam flower	Found growing in deciduous or mixed forest, often in wet hollows or springy places. Wisconsin, at the western edge of foamflowers range, has three known sites including one on the Lakewood-Laona Ranger District.	Included, suitable habitat.	None
American elm	Found in swamp forests such as river floodplains and also in rich upland hardwoods, especially somewhat poorly drained areas.	Included, recorded observation.	May impact individuals but not likely to cause a trend to federal listing or loss of viability
Dwarf bilberry	Found in sandy and gravelly openings in dry pine-oak woodland and barrens, sandy old-field swales, and in rock crevices near rivers.	Included, confirmed observation.	None

Species	General Habitat Description	Inclusion or Exclusion	Impact
Marsh valerian	Found in wet, calcareous, open white cedar woodland and fen habitats, often underlain with limestone and with groundwater upwelling.	Excluded, no habitat.	None

Table A3. Summary of determination of impacts to RFSS.

Species	No Impact	Beneficial Impact	May impact individuals but not likely to cause a trend to Federal listing or loss of viability	May impact individuals and likely to result in a trend to Federal listing or loss of viability
Animal Species				
Northern goshawk		X	X	
Lake sturgeon	X			
LeConte's sparrow	X			
Upland sandpiper	X			
Red-shouldered hawk		X	X	
Swainson's thrush			X	
Black tern	X			
Wood turtle	X			
Trumpeter swan	X			
Cerulean warbler		X	X	
Spruce grouse	X			
Green-faces clubtail	X			
Henry's elfin butterfly	X			
Northern blue butterfly		X		
American (pine) marten	X			
Greater redhorse	X			
Northern (long-eared) myotis	X			
Pugnose shiner	X			
Brown (chryxus) arctic	X			
Extra-striped snaketail	X			
Pygmy snaketail	X			
Connecticut warbler	X			
Tawny crescent spot		X		
Black-backed woodpecker	X			
West Virginia white	X			
Eastern pipistrelle bat	X			
Bullhead mussel	X			
Forcipate emerald	X			
Zebra clubtail	X			
Sharp-tailed grouse	X			
Ellipse mussel	X			
Plants				
Round-leaved orchis	X			
Missouri rock cress	X			
Green spleenwort	X			
Alpine milkvetch	X			
Mingan's moonwort	X			

Species	No Impact	Beneficial Impact	May impact individuals but not likely to cause a trend to Federal listing or loss of viability	May impact individuals and likely to result in a trend to Federal listing or loss of viability
Goblin fern			X	
Blunt-lobed grape-fern			X	
Ternate grape-fern	X			
Northern water-starwort	X			
Fairy slipper	X			
Large toothwort	X			
Assiniboine sedge	X			
Rocky Mountain Sedge	X			
Crawe's sedge	X			
Northern bog sedge	X			
Shore sedge	X			
Livid sedge	X			
Michaux's sedge	X			
Many-headed sedge	X			
Sheathed sedge	X			
Spineless hornwort	X			
Northern wild comfrey	X			
Ram's-head lady's-slipper	X			
Glade fern	X			
Fairy bells, Hooker's mandarin	X			
Spreading wood fern	X			
Male fern	X			
Fragrant fern	X			
Engelmann's spike-rush	X			
Capitate spike-rush	X			
Few-flowered spike-rush	X			
Marsh willow-herb	X			
Marsh horsetail	X			
Rusty cotton-grass	X			
Large-leaved avens	X			
Butternut		X		
Moor rush	X			
Large-flowered ground-cherry	X			
American shore-grass	X			
Auricled twayblade	X			
Broad-leaved twayblade	X			
White adder's-mouth	X			
Indian cucumber-root	X			
Large-leaved sandwort	X			
Farwell's water-milfoil	X			

Species	No Impact	Beneficial Impact	May impact individuals but not likely to cause a trend to Federal listing or loss of viability	May impact individuals and likely to result in a trend to Federal listing or loss of viability
Canada mountain rice-grass	X			
American ginseng			X	
Marsh grass-of-parnassus	X			
Arrow-leaved sweet colt's-foot	X			
Pale-green orchid	X			
Bog bluegrass	X			
Western Jacob's-ladder	X			
Braun's holly fern	X			
Algal-like pondweed	X			
Hill's pondweed	X			
Spotted pondweed	X			
Giant pinedrops	X			
Lesser wintergreen	X			
Small yellow water-crowfoot	X			
Lapland buttercup	X			
Brown beak-sedge	X			
White mandarin	X			
Heart-leaved foam flower	X			
American elm	X			
Dwarf bilberry		X		
Marsh valerian	X			

Monitoring Methods and Trend Data of Management Indicator Species

Monitoring requirements for Management Indicator Species (MIS) for the Nicolet National Forest (NNF) are addressed on pages 57-64, 68 and 165 of the Land and Resource Management Plan, NNF (USDA, Forest Service 1986). Further MIS data is presented in the Final Environmental Impact Statement (FEIS) on pages 2-75, 3-33 to 3-37, and D-30 to D-32. The End of Decade Monitoring Report for the Chequamegon/NNF (1998) provides an update to wildlife populations for the period from 1986 to 1996. This report includes a summary of monitoring methods and trend data for selected key MIS for alternative comparison and monitoring identified in the Nicolet's FEIS (1986). Monitoring methods and trend data for an additional four MIS species that were used during alternative evaluation in the SE Pine Environmental Assessment (EA) are also included. Site-specific surveys are recommended for certain MIS (i.e. common loon, bald eagle) if potential habitat is present in the project area. Randomized plot or transect surveys are utilized for assessing area populations for most of the remaining species and are listed below. Complete project area site-specific surveys are not necessary to assess populations of these species.

Habitat by Vegetation Type (acres)

Forest Type	NNF	Lakewood-Laona R.D.	McCaslin Project Area
Jack Pine	9,025	4,091	281
Red Pine	46,585	24,564	875
White Pine	10,975	3,437	855
Hemlock	4,974	1,641	23
Balsam Fir/Aspen	14,600	7,216	328
Black Spruce	2,895	9,033	85
Cedar	8,970	3,697	102
White Spruce	17,250	7,276	710
Lowland Conifer	78,950	24,120	622
Cedar/Aspen/PB	1,390	1,080	13
Pine/Oak	1,695	1,542	31
Oak	11,865	11,006	1531
Lowland Hardwood	11,650	9,067	362
Northern Hardwood	237,260	121,786	6555
Aspen	137,545	85,361	7023
Paper Birch	9,810	5,256	434
Lowland Opening	44,905	19,476	1676
Upland Openings	12,875	6,752	310
Total Acres	**663,465**	**346,775**	**21,816**

Management Indicator Species

White-tailed Deer:

Preferred Habitat: Forest edges, areas interspersed with fields, woodland openings, aspen and regenerating hardwood and conifer forest, dense conifer swamps (seasonally).

Unit of Measure: The table below illustrates deer numbers by unit from 1990 through 1999. Population figures are prior to fall hunting season. Deer population figures were based on the Wisconsin Department of Natural Resources' SEX-AGE-KILL (SAK) formula. The Winter Severity Index (WSI) is calculated to determine weather affects on deer in relation to deep snow and cold temperatures. The WSI is calculated by adding the number of days with 18'' or more of snow with the days when the minimum temperature are 0^0 F or below between December 1 and April 30. Generally, a WSI < 50 is considered mild, 50 to 80 is moderate while an index > than 80 is considered severe.

Estimated Annual White-tailed Deer Populations

	Deer Range	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Deer Unit 38	365sq.mi.	11,315	9,125	8,030	9,855	12,045	15330	12,775	10,220	11,680	12,775	11,900	10,300
Deer Unit 39	383sq.mi.	14,554	12,256	6,894	9,575	13,022	15,703	7,660	5,362	8,809	9,575	11,700	10,400
Deer Unit 40	331sq.mi.	13,022	13,168	11,366	14,151	12,909	14,585	8,700	5,624	10,374	11,375	8,600	4,400
Deer Unit 44	445sq.mi.	8,900	7,120	6,675	8,455	10,235	12,460	8,455	5,785	9,345	10,235	8,100	9,300
Deer Unit 45	584sq.mi.	19,272	14,600	9,344	13,432	15,768	18,688	9,928	7,592	11,680	14,600	14,500	11,400
Deer Unit 49A	244sq.mi.	5,856	5,124	2,684	4,880	5,856	5,856	4,392	5,856	6,832	7,076	7,600	7,100
WSI-White Lake	na	no data	47	51	45	33	116	111	20	41	37	69	18
W.S.I.-Wisconsin	na	37	50	43	48	32	126	116	16	44	43	83	28

Frequency of Measure: The Wisconsin Department of Natural Resources (DNR) coordinates annual population assessments for white-tailed deer utilizing harvest records, summer deer observations and an index of winter severity. The Wisconsin DNR manages the deer population utilizing a variety of deer hunter harvest methods. The population is monitored each year by analysis of "sex-age-kill" data collected during the firearms hunting season. Numbers of deer are tracked statewide as well as by individual management units, each with a designated over-winter goal.

Management Objective: The Lakewood/Laona District falls predominately within portions of six deer management units, specifically Units 38, 39, 40, 44, 45 and 49A. A small portion (less than 500 acres) of Unit 51B is also within the District boundary. Over-winter goals are 20 deer per square mile for units 38, 39, 40, and 45; 15 deer per square mile for unit 44; 25 deer per square mile for unit 49A. The entire Lakewood/Laona District encompasses approximately 350,000 acres, or about 546 square miles, although not this entire habitat is considered deer range. Thus the over winter population goal would approximate about 11,000 white-tailed deer post harvest on the federal lands within the combined respective units

Habitat needed to meet management objective*:* Deer prefer early successional habitat for grazing and young hardwood and aspen forest for browsing. Also, depending on winter severity, thermal cover habitat can be critical as well.

Current Habitat Availability*:* See vegetative composition table above.

Population Trend Data: Based on the table above, the population locally and statewide is high, and increasing. With the consecutive mild winters of 1997, 1998 and 1999, deer populations have increased with a current white-tailed deer population of approximately 15,000 on federal lands within the Lakewood/Laona District. Statewide, deer numbers are estimated at about 1.6 million for 2002, before the gun deer season.

Eastern Gray Squirrel:

Preferred Habitat: Oak or mixed oak/pine forest.

Unit of Measure: Amount of habitat available divided by estimated territory size. Habitat type and age and age will determine suitability as determined by a coefficient in the following table.

Squirrels Per Acre Per Year

Forest Type Age in Years	10	20	30	40	50	60	70	80	90	100	110	120	130	Old Growth
Aspen/Oak				.150	.300	.300								
Aspen /Jack Pine/Oak				.120	.250	.250								
N. Hardwood Even age				.050	.100	.100	.100	.150	.050					

N. Hardwood All age	.150	.150	.150	.150	.150	.150	.150	.150	.150	.150	.150	.150	.150	.200
Mixed Hardwood				.150	.300	.300	.300	.300	.300	.200				.500
Oak				.250	.500	.500	.500	.500	.500	.250				.700
White Pine/Oak				.120	.250	.250	.250	.250	.250	.250	.250	.120		.350

Frequency of Measure: Surveys are not conducted specifically for gray squirrel; this species is primarily managed by providing suitable habitat.
Management Objective: Provide habitat that will support 10,840 animals forest-wide. Habitat surveys will serve to monitor the trend in the population. Amount of available habitat is tracked through NNF Combined Data System (CDS).
Habitat needed to meet management objective: Depending on the forest type, 10, 840 animals would require 15,500 to 90,300 acres of habitat.
Current Habitat Availability: Approximately 13,800 acres of oak or mixed oak habitat occurs on the Nicolet forest. Many more acres of non-oak habitat occurs as well all across the forest. (See vegetation composition table above).
Current Trend: No forest trend data is available, but WDNR harvest statistics indicate that statewide, the squirrel population appears to be stable, since 1996.
Population Trend Data: Between 1983 and 1988, the average harvest was about 1.3 million squirrels, but harvest numbers have declined to about 600,000 animals since then. The northern forest habitat does not provide the best habitat for this species, and the bulk of the harvest occurs south of the northern forest area.

Beaver:
Preferred Habitat: Riparian areas, streams, lakes associated with aspen and other deciduous trees.
Unit of Measure: Beaver population estimates area determined on the Forest by fall, leaf off, aerial survey of mostly Class I, II, and III trout streams, some of which are maintained each year in a free flowing state utilizing beaver control measures. It is assumed that each colony contains, on average 5.5 beaver, typically two adults, and a combination of three or four young (past and current years kits). Only stream colonies are monitored, and only 50% of the stream habitat is surveyed, thus the numbers in the table below are more of an index of the forest wide beaver population.
Frequency of Measure: Annual beaver stream survey flight transects to determine the numbers of active colonies are contracted on the Forest with USDA Animal Damage Control personnel. The Wisconsin DNR coordinates statewide surveys.
Management Objective: Provide habitat that will support approximately 4,300 animals, or about 782 colonies on the Nicolet Forest. Based on the existing number of 1,288 stream miles, a population of 4,300 animals would require 0.61 beaver per mile of stream. Again, these figures exclude beaver that utilize lake habitat. Primary habitat surveys will also serve to monitor the trend in the population. Amount of available habitat is tracked through Nicolet NF Combined Data System (CDS). The goal of 4,300 beaver Forest wide, was determined prior to collection of yearly survey data, and should likely be reevaluated.
Habitat needed to meet management objective: The Nicolet forest contains approximately 1,288 stream miles, thus to support 782 beaver colonies (4,300 individuals), an overall population density of 0.61 beaver per stream mile would need to be maintained. This figure would be somewhat lower since an unknown percentage of beaver do occupy lake habitat.
Current Habitat Availability: Approximately 1288 miles of stream in addition to numerous acres of lakes, bogs and other minor drainages, minus approximately 168 miles that area maintained "beaver free", via U.S.D.A., Animal Damage Control (ADC) contract agreement.
Current Trend: Forest wide, numbers of beaver fluctuate from year to year, and are influenced by beaver pelt prices, weather related stream accessibility during trapping season, state bounties, drought, and probably other biological and environmental factors. The most recent data indicates a lower population in the late 1990's as compared to earlier years.
Population Trend Data: Statewide beaver populations were estimated at 90,500 animals in 1998 (Kohn pers. comm.) and in northeastern Wisconsin (Zone B) there are approximately 23,000. The table below indicates decreasing population trends across the Nicolet forest, and is based on a survey of approximately 50% of the Nicolet streams.

Active Beaver Colonies from 1989 – 2001.

District	# Streams	# Miles	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Eagle River	34	125	73	97	90	107	94	79	62	43	31	80	52	40
Colonies /Mile			0.58	0.78	0.72	0.85	0.75	0.63	0.5	0.34	0.25	0.64	0.42	0.32
Florence	42	150	69	93	74	86	79	75	80	29	42	60	51	36
Colonies /Mile			0.46	0.62	0.49	0.57	0.53	0.5	0.53	0.19	0.28	0.40	0.34	0.24
Laona	67	190	172	176	188	153	74	96	111	97	57	26	58	35
Colonies /Mile			0.91	0.93	0.99	0.81	0.34	0.51	0.58	0.51	0.30	0.14	0.31	0.18
Lakewood	42	175	33	32	46	65	53	43	48	44	16	11	20	14
Colonies /Mile			0.19	0.18	0.26	0.37	0.30	0.25	0.27	0.25	0.91	0.06	0.11	0.08
Total	185	640	347	398	398	411	300	293	301	213	146	177	181	125

Bobcat:

Preferred Habitat: Areas of low road density and low human disturbance, riparian and swamp conifer forest.
Unit of Measure: Amount of habitat available and population trends as determined from harvest statistics and winter track surveys.
Frequency of Measure: Annually, by DNR harvest statistics and winter track survey transects.
Management Objective: Maintain a viable population of bobcat across the forest The Nicolet LRMP estimate of 46 animals should be reevaluated in light of the new data available. Recently, the Wisconsin DNR began managing the bobcat population via controlled harvest utilizing a permit system. In 1999, 180 permits were allotted with a pre harvest statewide population estimate of about 2,200 animals. Habitat surveys will serve to monitor the trend in the population. Amount of available habitat is tracked through Nicolet NF Combined Data System (CDS).
Habitat needed to meet management objective*:* Habitat needed to support 46 animals would require about 368 sq. miles, while the Nicolet encompasses about 1,000 sq. miles. Based on DNR data, the Nicolet should support about 125 animals.
Current Habitat Availability: Statewide, the DNR estimates 18,500 sq. miles of habitat, which coincides with DNR fisher management units A, B, C, & D. Population estimates are 1 bobcat/8 sq. miles. According to Kohn (2000, per. communication) bobcat numbers are probably slightly higher on the Nicolet because of an area closed to dry land trapping. Specifically, the Nicolet contains a 120,000-ac fisher/American pine marten area in which dry land trapping is prohibited, and only hunting with dogs is allowed in this area. The 120,000-acre unit also contains the 20,104-acre Headwaters Wilderness area that contains only one road passing through the mid section.
Population Trend Data: Harvest, age, and reproductive data incorporated into the Minnesota Furbearer Population Model suggests that the fall bobcat population in Northern Wisconsin has fluctuated between 1,500 and 2,400 bobcats during 1981-2001. Bobcat populations declined in the mid-1980s but conservative harvests since 1988 have resulted in a steady population growth. The one exception was in 1993 when poor reproduction caused a drop in bobcat population to about 1,500. (Kohn et. al. 2000)

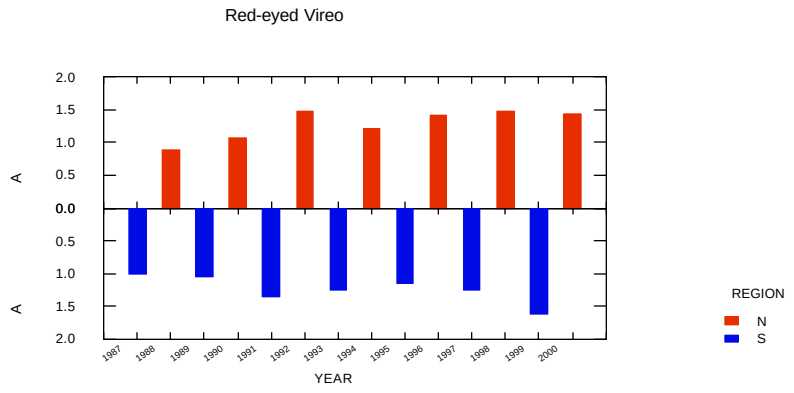
Thirteen-lined Ground Squirrel:

Preferred Habitat: Upland Openings.
Unit of Measure: Amount of potentially suitable habitat available.
Frequency of Measure: Surveys currently are not being conducted for this species on the Forest. This species is primarily managed by providing suitable habitat. Habitat data is available in Combined Data System as necessary.
Management Objective: Provide habitat that will support approximately 7,100 animals.
Habitat needed to meet management objective: Approximately 6,000 acres of permanent upland openings.
Current Habitat Availability: Approximately 6,000 acres.
Current Trend: Unknown.
Population Trend Data: National figures are not available for the thirteen-lined ground squirrel. The State of Wisconsin does not collect population data on the thirteen-lined ground squirrel. The Forest Service has not conducted surveys for this species. Generally, the population of thirteen-lined ground squirrels likely fluctuates with vegetation and weather conditions, such that in years of mild winter weather, populations increase, while declines are expected following severe winters. This species is considered common in Wisconsin with a population estimated at approximately 10 million animals (Jackson 1961). Its range has expanded northward but is less plentiful in the forested portions of the state, including the Nicolet N.F.

Common Loon:
Preferred Habitat: Open water lakes larger than 20 acres and clear or light brown water.
Unit of Measure: Population trends.
Frequency of Measure: Surveyed each year, but not all lakes, by FS personnel and volunteers. Randomized lake surveys coordinated by Wisconsin Project Loon Watch are conducted every five years. Additional site-specific surveys are recommended for this species if suitable habitat is present in the project area. No potential habitat exists in the SE Pine project area.
Management Objective: Provide habitat that will support approximately 48 breeding pairs on the Nicolet Forest, or about 20 pairs on the Lakewood/Laona Ranger District. Monitor selected lakes in cooperation with Wisconsin Project Loon Watch. Selected lakes are surveyed by volunteer "loon rangers" and/or by district personnel that report activity on specific lakes. Lakes are surveyed mostly in July following nesting activities. Data is collected on the number of adults and young and maintained at the respective district offices as well as the Sigurd Olsen Environmental Institute at Ashland, WI.
Habitat needed to meet management objective: Approximately 11,000 acres.
Current Habitat Availability: More than 10,976 acres on 46 lakes. Acres include only Wisconsin water, and only lakes with federal shoreline. Other lakes meet the federal shoreline criteria, and the 20-acre size limit, but were excluded due to lack of data regarding loon use.
Population Trend Data: Although no precise continent wide estimate of populations is available, some 500,000-600,000 adults occur in the U.S. and Canada (J. McIntyre, pers. comm.). The estimated number of adults in the lower U.S. number close to 18,000 with about 34,000 found in Alaska. Wisconsin loon numbers appeared to increase in the 1970's and early 80's and leveled off in the late 80's and 90's (Daulton et. al. 1997). NNF populations have followed these statewide trends and appear to be relatively stable. Loons use nearly all of the lakes larger than 20 acres on the Lakewood/Laona District in some capacity. Twenty-three lakes on the Lakewood/Laona District are considered permanent nesting territories with another seven lakes having periodic nesting. District populations have remained stable if not slightly increasing in recent years. The following population data was collected by local district surveys, volunteer surveys, and the Project Loon Watch (Sigurd Olson Environmental Institute, Northland College, Ashland, WI) and is available for the State of Wisconsin. (Daulton et. al.1997). Population estimates for the Nicolet Forest, calculated utilizing NNFBIRD population modeling software program (Dobiesz 1998), are shown in Table 1.

Red-eyed Vireo:
Preferred Habitat: Deciduous forest.
Unit of Measure: Ten minute point count taken across all habitat types.
Frequency of Measure: Alternate years, either north during even numbered years, or south unit, during odd numbered years in the Nicolet Breeding Bird Survey using standardized point counts.
Management Objective: Provide habitat that will support 118,500 breeding pairs, on the Nicolet Forest.
The amount of available habitat is tracked through Nicolet National Forest (NNF) Combined Data System (CDS). Population trends are tracked through yearly NNF Breeding Bird Surveys (BBS).
Habitat needed to meet management objective: Assuming one individual per acre of suitable habitat, 237,000 acres of hardwood habitat excluding aspen, would meet management goals. Although aspen habitat is considered unsuitable, 14 years of breeding bird survey data has shown that aspen, as well as other non-hardwood habitat are utilized by red-eyed vireo.
Current Habitat Availability: Approximately 270,000 acres. See Habitat By Vegetation table above.
Population Trend Data: In Wisconsin, red-eyed vireos are considered an abundant summer resident in the north and a common resident in the south and central areas (Robbins 1991). Rolley (2000) reported a highly significant population increase in red-eyed vireos in Wisconsin between 1983 and 1996. Population trends for red-eyed vireos on the Lakewood/Laona Ranger District (La/La) showed an increased between 1989-2002. The North American Breeding Bird Survey (NA BBS) data showed a statistically significant increase for the NNF during the same time

period (Howe and Roberts, 2002).



Black-throated Green Warbler:

Preferred Habitat: Primarily upland conifer, but also lowland conifer and hemlock inclusions in hardwood or mixed forest habitat.

Unit of Measure: Ten minute point count taken across all habitat types.

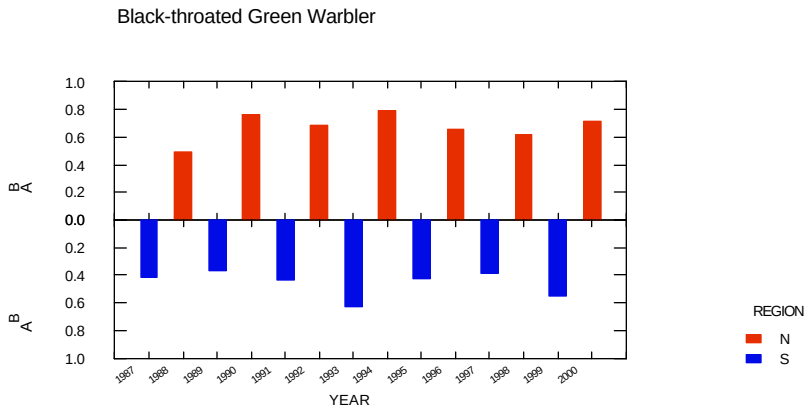
Frequency of Measure: Alternate years, either north during even numbered years, or south unit, during odd numbered years in the Nicolet Breeding Bird Survey using standardized point counts.

Management Objective: Provide habitat that will support 53,500 breeding pairs, on the Nicolet Forest. The amount of available habitat is tracked through Nicolet NF Combined Data System (CDS). Population trends are tracked through yearly Nicolet Breeding Bird Surveys.

Habitat needed to meet management objective: Assuming one individual per acre of suitable habitat, 107,000 acres of upland conifer habitat and hemlock, would meet management goals. Fourteen years of Breeding Bird Surveys have shown that this MIS utilizes other habitats, to a lesser extent.

Current Habitat Availability: Approximately 113,000 acres, (See Habitat By Vegetation table above).

Population Trend Data: In Wisconsin, black-throated green warblers are considered a fairly common summer resident in the north (Robbins 1991). Rolley (2000) reported an increase in black-throated green warblers in Wisconsin between 1983 and 1996. Population trends for black-throated green warblers on the La/La showed an increased between 1989-2002. The North American Breeding Bird Survey (NA BBS) data showed a statistically significant increase for the NNF during the same time period (Howe and Roberts, 2002).



Ovenbird:

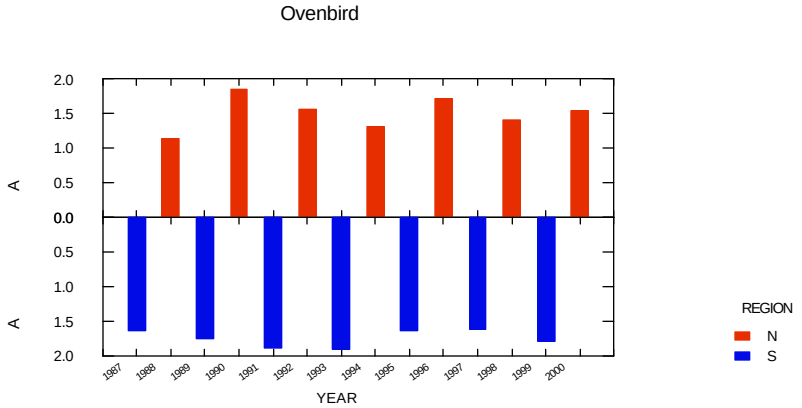
Preferred Habitat: Long rotation, old growth, mature, and uneven aged deciduous forest.

Unit of Measure: Ten minute point count taken across all habitat types.

Frequency of Measure: Alternate years, either north during even numbered years, or south unit, during odd numbered years in the Nicolet Breeding Bird Survey using standardized point counts.

Management Objective: Provide habitat that will support 109,000 breeding pairs, on the Nicolet Forest.

The amount of available habitat is tracked through Nicolet NF Combined Data System (CDS). Population trends are tracked through yearly Nicolet Breeding Bird Surveys.
Habitat needed to meet management objective: Assuming one individual per 0.8 acre of suitable habitat, 174,000 acres of deciduous forest habitat, would meet management goals.
Current Habitat Availability: Approximately 238,000 acres. See Habitat By Vegetation table above. Fourteen years of Breeding Bird Survey data has shown that this bird is found at some level in nearly all habitats on the Forest.
Population Trend Data: In Wisconsin, ovenbirds are considered an abundant summer resident in the north but rather uncommon in the south (Robbins 1991). Rolley (2000) reported a highly significant increase in ovenbirds in Wisconsin between 1983 and 1996. Ovenbirds populations remained stable and were one of the most abundant birds identified between 1989-2002 on the NNF BBS and NA BBS (Howe and Roberts, 2002).



<u>Bald Eagle:</u>
Preferred Habitat: Breeding habitat most commonly includes areas close to (within 4km) coastal areas, bays, rivers, lakes, or other bodies of water that reflect the general availability of primary food sources including fish, waterfowl, and seabirds (Green 1985).
Unit of Measure: Number of breeding pairs.
Frequency of Measure: The Forest Service and Wisconsin DNR survey each year known and historic eagle territories cooperatively. Two flights are conducted, one in early spring and a second in early summer. The first flight determines the amount of active territories, while the second flight assesses nest productivity. New or suspected territories are checked at these times as well. Survey results are maintained at both federal and DNR offices. Additional site-specific surveys are recommended for this species if suitable habitat is present in the project area. No potential habitat exists in the SE Pine project area.
Management Objective: A population recovery goal of 30 territories was listed in the Nicolet FEIS (1986). The Forest has attained this objective twice (1998 and 1999).
Current number of breeding pairs: In 1999, 31 breeding pairs were identified within the NNF boundary.
Habitat needed to meet management objective: During the development of the Nicolet Forest Plan, 19 existing bald eagle territories and 23 potential territories were identified (FEIS 1986). The potential territories included areas adjacent to large water bodies with productive fisheries and available nest trees. The goal of 30 existing territories was identified in the Nicolet's FEIS (1986). This would require use of at least 11 potential territories.

Population Trend Data: Nationally bald eagle territories have increased from 1,480 in 1982 to 5,748 in 1998. In the lower 48 states, breeding population has doubled every 6–7 years since the late 1970's (USFWS, Fed. Register 12 July 1994. p.3585). Population trends on the Forest follow the national trends as the number of occupied territories has more than doubled between 1975 and 1999. In addition, the number of young produced on the Forest has also increased from a low of 12 in 1976 to 42 in 1999. In 1999, the 27 successful territories produced 42 young, for a ratio of 1.55-young/successful nest and a ratio of 1.35-young/occupied nest. These data compare favorably with the overall regional trend and exceed the Northern States Bald Eagle Recovery Plan goal of an average annual productivity rate of at least 1.0 young/occupied nest. Similar trends have been noted on the Lakewood/Laona Ranger District as the amount of occupied territories has increased from four in 1975 to 13 in 1999. Young production has also increased from a low of 2 in 1976 to 20 in both 1998 and 1999. The Forest bald eagle population is a reflection

of the successful recovery of this species in Wisconsin. The following table lists annual bald eagle population levels on the NNF since 1975:

Population Trends of the Bald Eagle on the NNF and the Lakewood/Laona Ranger District from 1975 to 2001.

Year	WI Breeding Pairs	Nicolet N.F. Occupied Territories	Nicolet N.F. Successful Territories	Nicolet N.F. Young Produced	Lakewood/ Laona District Occupied Territories	Lakewood/ Laona District Successful Territories	Lakewood/ Laona District Young Produced
1975	111	15	10	16	4	2	3
1976	149	13	8	12	2	1	2
1977	151	15	12	19	3	2	3
1978	140	20	11	17	5	3	3
1979	151	16	15	22	4	3	4
1980	175	17	8	15	4	2	4
1981	188	15	12	20	5	4	7
1982	207	16	12	22	5	3	6
1983	198	15	10	17	5	4	6
1984	239	15	10	16	5	3	4
1985	214	16	13	22	4	4	6
1986	244	17	12	24	5	2	3
1987	295	21	18	33	6	6	10
1988	326	21	18	31	7	5	7
1989	336	17	15	29	7	5	9
1990	358	22	18	23	8	8	10
1991	414	26	19	35	8	8	16
1992	424	25	18	32	9	9	15
1993	464	28	18	27	8	6	8
1994	533	25	14	20	11	7	8
1995	583	27	14	24	11	7	11
1996	625	29	19	25	12	8	11
1997	645	29	24	36	13	11	16
1998	689	31	21	37	13	10	20
1999	751	31	27	42	13	12	20

Common Raven:

Preferred Habitat: Mature, old growth, and uneven aged upland and lowland conifer forest: mixed hardwood and aspen forest for nesting, and entire forest for foraging.

Unit of Measure: Ten minute point count taken across all habitat types.

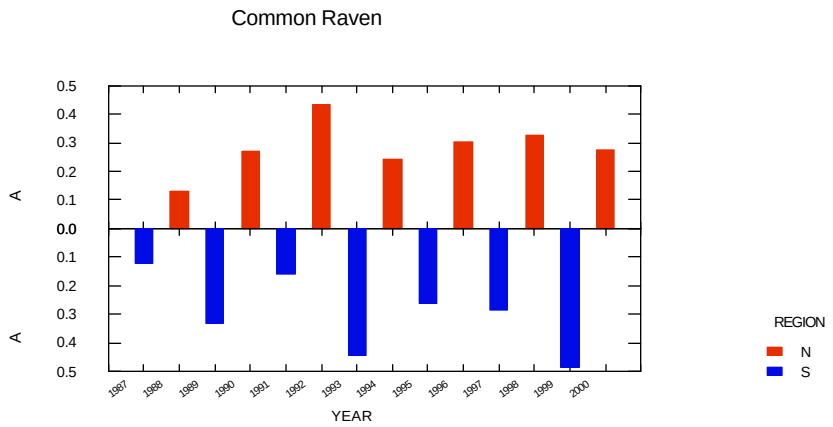
Frequency of Measure: Alternate years, either north during even numbered years, or south unit, during odd numbered years in the Nicolet Breeding Bird Survey using standardized point counts.

Management Objective: Provide habitat that will support 56 breeding pairs, on the Nicolet Forest (FEIS 1986). The amount of available habitat is tracked through the Forest Combined Data System (CDS). Population trends are tracked through yearly Nicolet Breeding Bird Surveys.

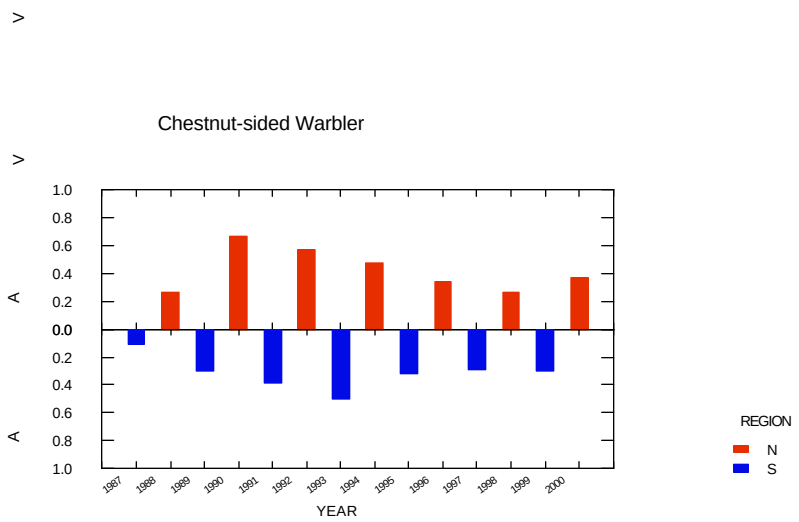
Habitat needed to meet management objective: Assuming one individual per 2,175 acres of suitable habitat, 121,800 acres of mature upland and lowland conifer as well as older hardwood and aspen habitat, would meet management goals.

Current Habitat Availability: Approximately 238,000 acres of mature forest habitat (greater than 70 years of age). See Habitat By Vegetation table above.

Population Trend Data: In Wisconsin, raven are considered fairly common summer resident in the north but rather uncommon elsewhere (Robbins 1991). Rolley (2000) reported a highly significant increase in raven in Wisconsin between 1983 and 1996. Population trends for the common raven on the La/La showed an increased between 1989-2002. Also, the North American Breeding Bird Survey (NA BBS) data showed a statistically significant increase for the NNF during the same time period (Howe and Roberts, 2002).

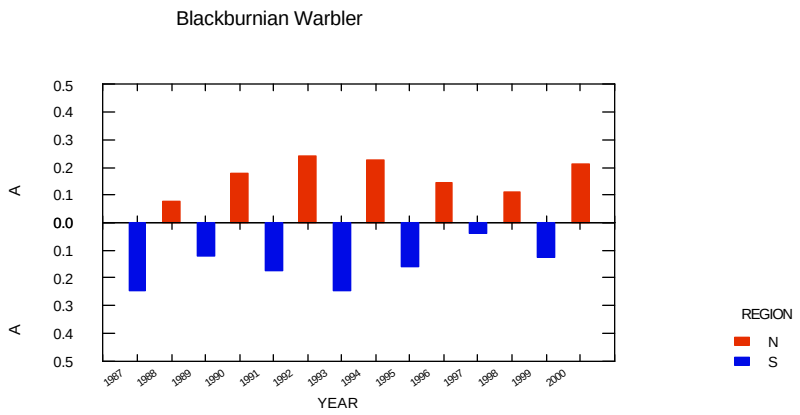


Chestnut-sided Warbler:
Preferred Habitat: Regenerating deciduous forest.
Unit of Measure: Ten minute point count taken across all habitat types.
Frequency of Measure: Alternate years, either north during even numbered years, or south unit, during odd numbered years in the Nicolet Breeding Bird Survey using standardized point counts.
Management Objective: Provide habitat that will support 25,000 breeding pairs, on the Nicolet Forest (FEIS 1986). The amount of available habitat is tracked through Nicolet NF Combined Data System (CDS). Population trends are tracked through yearly Nicolet Breeding Bird Surveys.
Habitat needed to meet management objective: Assuming one individual per 0.6 acres of suitable habitat, 30,000 acres of regenerating hardwood habitat including aspen, would meet management goals.
Current Habitat Availability: See Habitat By Vegetation table above. Currently 17,865 acres of regenerating (less than 10 years old) hardwood habitat including aspen exists on the Nicolet.
Population Trend Data: In Wisconsin, chestnut-sided warblers are considered a common summer resident in the north but a rare summer resident in the south (Robbins 1991). Rolley (2000) reported an increase in chestnut-sided warblers in Wisconsin between 1983 and 1996. Population trends for chestnut-sided warblers on the La/La showed an decrease on the south half of the NNF, but increased along road side survey sites between 1989-2002. Also, the NA BBS data showed an increase for the NNF during the same time period (Howe and Roberts, 2002).

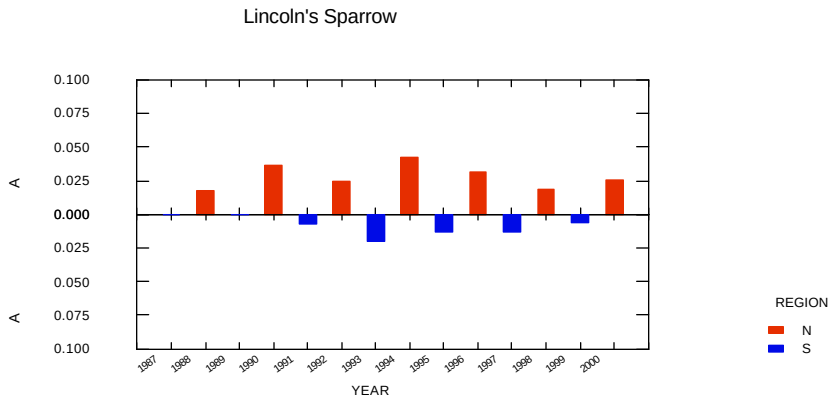


Blackburnian Warbler:
Preferred Habitat: Primarily upland conifer, but also lowland conifer and hemlock inclusions in hardwood or mixed forest habitat.
Unit of Measure: Ten minute point count taken across all habitat types.

Frequency of Measure: Alternate years, either north during even numbered years, or south unit, during odd numbered years in the Nicolet Breeding Bird Survey using standardized point counts.
Management Objective: Provide habitat that will support 10,000 breeding pairs, on the Nicolet Forest (FEIS 1986). The amount of available habitat is tracked through Nicolet NF Combined Data System (CDS). Population trends are tracked through yearly Nicolet Breeding Bird Surveys.
Habitat needed to meet management objective: Assuming one individual per acre of suitable habitat, 20,000 acres of upland conifer habitat and hemlock, would meet management goals.
Current Habitat Availability: Approximately 71,000 acres of upland conifer and hemlock habitat are present on the Nicolet land base, (See Habitat By Vegetation table above).
Population Trend Data: In Wisconsin, blackburnian warblers are considered fairly common summer resident in the north but a casual summer resident in the south (Robbins 1991). Rolley (2000) reported a stable population of blackburnian warblers in Wisconsin between 1983 and 1996. Population trends for the blackburnian warbler on the La/La showed an increased between 1989-2002. Also, the North American Breeding Bird Survey (NA BBS) data showed a statistically significant increase for the NNF during the same time period (Howe and Roberts, 2002).



<u>Lincoln's Sparrow</u>
Preferred Habitat: The 1986 Nicolet LRMP Forest Plan identified the Lincoln's sparrow habitat as 0-10 year old regenerating upland softwood forest, however, based on Nicolet Breeding Bird Survey data, this species is more typically found in lowland conifer bog, as well as open tamarack, black spruce and white pine wetland/bog habitat.
Unit of Measure: Ten minute point count taken across all habitat types.
Frequency of Measure: Alternate years, either north during even numbered years, or south unit, during odd numbered years in the Nicolet Breeding Bird Survey using standardized point counts.
Management Objective: Provide habitat that will support 13,500 breeding pairs, on the Nicolet Forest (FEIS 1986). The amount of available habitat is tracked through the Forest Combined Data System (CDS). Population trends are tracked through yearly Nicolet Breeding Bird Surveys.
Habitat needed to meet management objective: Assuming one individual per 0.5 acre of suitable habitat, 13,500 acres of lowland and regenerating conifer habitat, would meet management goals.
Current Habitat Availability: A small percentage of the 78,000 of lowland conifer would be suitable for Lincoln's sparrow, in addition to some of the 44,900 acres of lowland opening. (See Habitat By Vegetation table above).
Population Trend Data: In Wisconsin, Lincoln's sparrow are considered an uncommon summer resident in the north but almost absent in the south (Robbins 1991). Rolley (2000) reported a slightly increasing population trend for Lincoln's sparrow in Wisconsin between 1983 and 1996. Howe and Roberts (2002) did not report population estimate trends for Lincoln's sparrow due to low number of observations.



Pine Warbler:

Preferred Habitat: Primarily mature upland conifer, especially red, jack and white pine forest.

Unit of Measure: Ten minute point count taken across all habitat types.

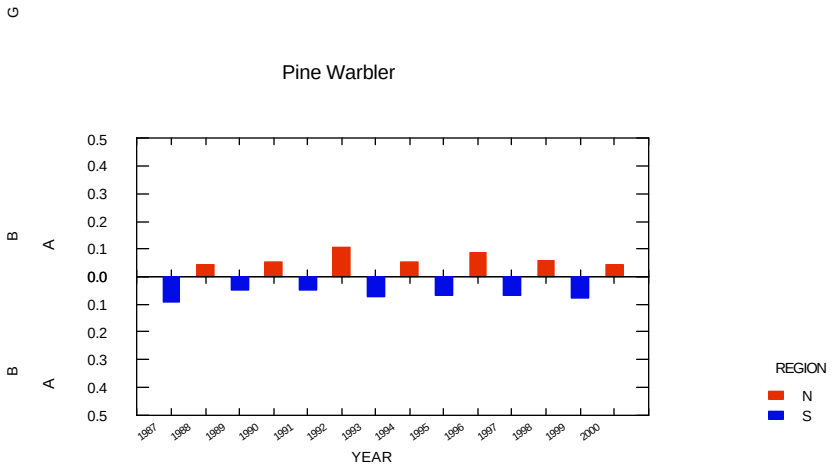
Frequency of Measure: Alternate years, either north during even numbered years, or south unit, during odd numbered years in the Nicolet Breeding Bird Survey using standardized point counts.

Management Objective: Provide habitat that will support 1,875 breeding pairs, on the Nicolet Forest (FEIS 1986). The amount of available habitat is tracked through NNF Combined Data System (CDS). Population trends are tracked through yearly Nicolet Breeding Bird Surveys.

Habitat needed to meet management objective: Assuming one individual per 3.5 acre of suitable habitat, 13,125 acres of mature pine forest habitat would meet management goals.

Current Habitat Availability: Approximately 66,585 acres of pine forest exist on the Nicolet, and approximately 26,000 acres are considered mature. (See Habitat By Vegetation table above).

Population Trend Data: In Wisconsin, pine warblers are considered a fairly common summer resident in the north but rather uncommon in the south (Robbins 1991). Rolley (2000) reported a highly significant increase in pine warblers in Wisconsin between 1983 and 1996. Population trends for pine warblers on the La/La showed an increased between 1989-2002. Also, the NA BBS data showed a statistically significant increase for the NNF during the same time period (Howe and Roberts, 2002).

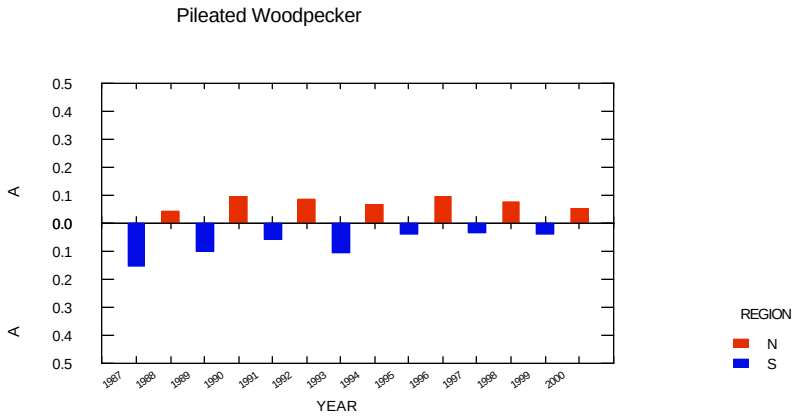


Black-backed Woodpecker

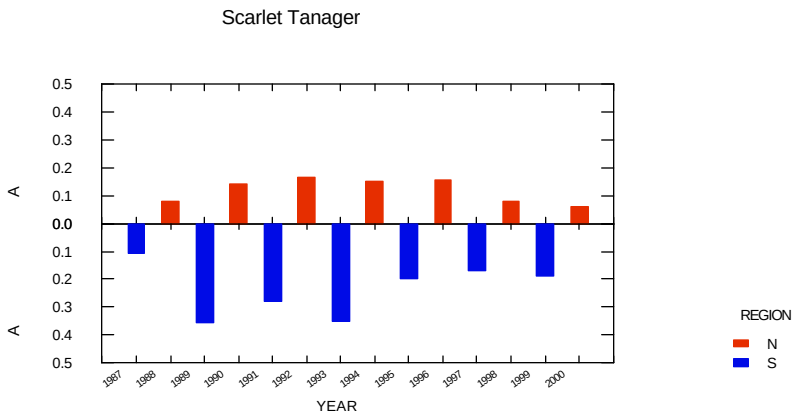
This species was mistakenly listed in the NNF, Land and Resource Management Plan (LRMP) Final Environmental Impact Statement (FEIS), as the Northern Three-toed Woodpecker. The correct indicator species is the black-backed woodpecker. This species is considered nomadic, moving to take advantage of dead conifer stands (Green 1995). Also, this species tends to exist at a fairly low density, and original plan population estimates should be reevaluated. Data provided below is from the 1986 Nicolet LRMP Wildlife Documents estimates.

Preferred Habitat: Black-backed woodpeckers are habitat specialists, keying in on dead and dying conifer habitat (Green 1995).
Unit of Measure: Amount of habitat available divided by 75 acres per nesting pair. Monitor population trends regionally.
Frequency of Measure: Alternate years, either north during even numbered years, or south unit, during odd numbered years in the Nicolet Breeding Bird Survey using standardized point counts.
Management Objective: Estimated objective is 235 breeding pairs or 470 individuals for the Nicolet side of the forest (FEIS 1986). Amount of available habitat is tracked through the Forest Combined Data System (CDS).
Habitat needed to meet management objective: Assuming 37.5 acres per individual, 17,625 acres of habitat would be needed to meet management objectives.
Current Habitat Availability: See Habitat Available Table above. A portion of the 14,600 acres of balsam habitat as well as a portion of the 78,950 acres of lowland conifer would be available.
Population Trend Data: Robbins (1991) considers this species an uncommon resident confined to Wisconsin's northernmost counties. This species has rarely been detected on the North American Breeding Bird Survey due to a lack of routes in preferred habitat and low detectability. Existing data show generally stable overall trends nationally between 1966 and 1996, with no significant increase survey-wide (Sauer et al. 1997). No observations of this species have been recorded during 14 years of the Nicolet Breeding Bird Survey on the La/La. The relative abundance of this species is too low to test for trends in abundance on the Nicolet. Howe and Roberts (2002) did not report population estimate trends for black-backed woodpeckers due to low number of observations.

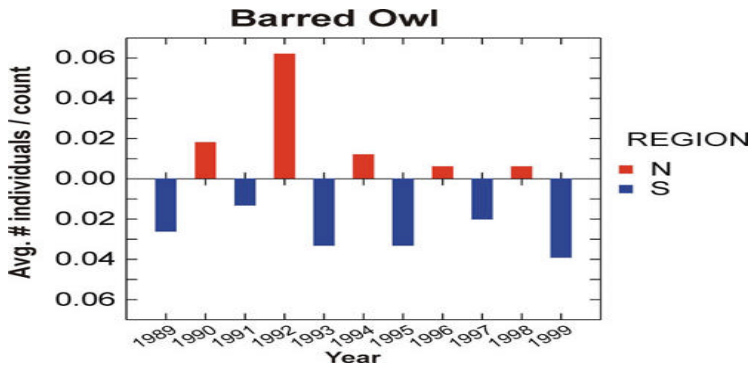
<u>Pileated Woodpecker:</u>
Preferred Habitat: Swamp Conifer and Northern Hardwoods.
Unit of Measure: Amount of habitat available and population trends.
Frequency of Measure: Alternate years, either north during even numbered years, or south unit, during odd numbered years in the Nicolet Breeding Bird Survey using standardized point counts.
Management Objective: Provide habitat that will support 2,050 breeding pairs (FEIS 1986). Amount of available habitat is tracked through the Forest Combined Data System (CDS). Population trends are tracked through yearly Breeding Bird Surveys.
Habitat needed to meet management objective: Assuming 87.5 acres per individual, 358,750 acres of habitat would be needed to meet management objectives.
Current Habitat Availability: See Habitat Available Table above. A significant amount of the 237,260 acres of northern hardwood and approximately 90,000 acres of swamp conifer/cedar habitat provide the major habitats for this species.
Population Trend Data: In Wisconsin, pileated woodpeckers are considered an uncommon resident in most of the state (Robbins 1991). Rolley (2000) reported a highly significant increase in pileated woodpeckers in Wisconsin between 1983 and 1996. Howe and Roberts (2002) did not report population estimate trends for pileated woodpeckers.



Scarlet Tanager:
Preferred Habitat: Deciduous forest and mature deciduous woodland, including deciduous and mixed swamp and floodplain forests and rich moist upland forest; prefers oak trees (Bushman and Therres 1988).
Unit of Measure: Ten minute point counts taken across all habitat types.
Frequency of Measure: Alternate years, either north during even numbered years, or south unit, during odd numbered years in the Nicolet Breeding Bird Survey using standardized point counts.
Management Objective: Provide habitat that will support 31,000 breeding pairs on the Nicolet Forest (FEIS 1986). The amount of available habitat is tracked through Nicolet NF Combined Data System (CDS). Population trends are tracked through yearly Nicolet Breeding Bird Surveys.
Habitat needed to meet management objective: Assuming one individual per 3.5 acres of suitable habitat, 217,000 acres of mature deciduous forest habitat or mixed conifer wetland habitat would meet management goals.
Current Habitat Availability: A significant amount of the 237,260 acres of northern hardwood habitat along with 11, 865 acres of oak and 78,950 acres of lowland conifer provide available habitat.
Population Trend Data: In Wisconsin, scarlet tanagers are considered a fairly common migrant and summer resident in most of the state (Robbins 1991). Rolley (2000) reported a increase in scarlet tanagers populations in Wisconsin between 1983 and 1996. Population trends for scarlet tanagers on the La/La showed an decrease on the south half of the NNF, but increased along road side survey sites between 1989-2002. Also, the NA BBS data showed an increase for the NNF during the same time period (Howe and Roberts, 2002).



Barred Owl:
Preferred Habitat: Mixed northern hardwoods with available cavities.
Unit of Measure: Amount of habitat available and Population trends.
Frequency of Measure: Alternate years, either north during even numbered years, or south unit, during odd numbered years in the Nicolet Breeding Bird Survey using standardized point counts.
Management Objective: Provide habitat that will support 311 breeding pairs (FEIS 1986).
Amount of available habitat is tracked through the Forest Combined Data System (CDS).
Habitat needed to meet management objective: Assuming one individual per 565 acres of suitable habitat, 351,430 acres of mixed northern hardwood would meet management goals.
Current Habitat Availability: A significant portion of approximately 250,000 acres of mixed northern hardwood habitat currently provides suitable habitat.
Population Trend Data: In Wisconsin, barred owl are considered fairly common resident in the state (Robbins 1991). Rolley (2000) reported a stable population trend for barred owl in Wisconsin between 1983 and 1996. Paulios (2002), also indicated that barred owls were well distributed throughout the Nicolet National Forest. Population trends for barred owls on the La/La showed an increase on the south half of the NNF, but a decrease along roadside survey sites between 1989-2002. Also, the NA BBS data showed a decrease for the NNF during the same time period (Howe and Roberts, 2002).



Ruffed Grouse:

Preferred Habitat: Mixed Forest Types and age classes particularly aspen in the Great Lakes Region.

Unit of Measure: Population trends.

Frequency of Measure: Annual standardized spring drumming route transects conducted by US Forest Service and Wisconsin DNR personnel.

Management Objective: Provide habitat that will support about 24,500 birds (FEIS 1986). Most districts have one or more grouse transects that are surveyed each spring by district biologists or other trained volunteers. Grouse survey routes consist of 10 survey sites traversed along a road. These same routes/stops are run each year. Sites are at one-mile intervals. In addition, population trends are tracked through yearly Breeding Bird Surveys accomplished by the Nicolet Breeding Bird survey.

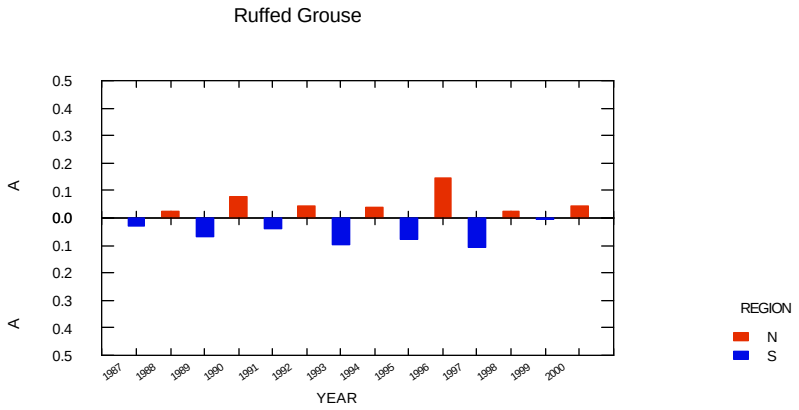
Amount of available habitat is tracked through Forest Combined Data System (CDS).

Habitat needed to meet management objective*:* Assuming one individual per six acres of suitable habitat, 147,000 acres of appropriate habit would be needed to meet management goals.

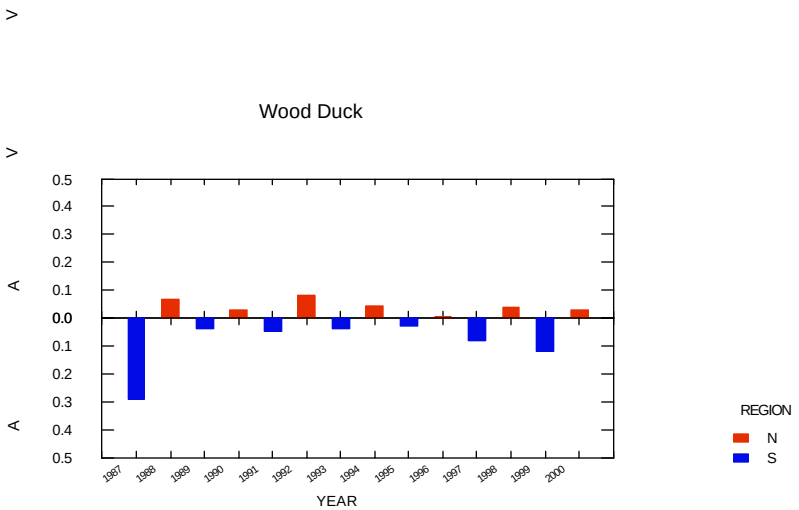
Current Habitat Availability: See Vegetation Table above. The 137,545 acres of aspen habitat and 14,600 acres of balsam fir/aspen habitat provide the majority of suitable habitat.

Population Trend Data: Statewide and northern Wisconsin drumming grouse surveys indicated that the ruffed grouse population decreased 23% between the 2000 and 2001. The Lakewood/Laona District has been conducting Ruffed Grouse Drumming Surveys in conjunction with the WDNR since 1985. The following table displays the drums per stop for the State of Wisconsin, Northern Region and the Lakewood/Laona District (Dhuey 2001).

Year	Wisconsin	Northern WI	Lakewood/Laona District
1994	0.58	0.67	1.10
1995	0.84	0.98	1.91
1996	0.86	1.10	1.83
1997	0.91	1.46	1.68
1998	1.24	2.08	3.56
1999	1.37	2.01	1.98
2000	1.22	2.00	2.40
2001	0.94	1.55	1.37



Wood Duck:
Preferred Habitat: Forest riparian habitat with available natural or artificial cavities for nesting.
Unit of Measure: Amount of habitat available and population trends.
Frequency of Measure: Annual monitoring of artificial nest boxes and statewide waterfowl censusing conducted by the Wisconsin Department of Natural Resources. Alternate years, either north ½ of Nicolet Forest during even numbered years, or south ½ during odd numbered years during Forest Breeding Bird Census.
Management Objective: Provide habitat that will support 1,160 breeding pairs (FEIS 1986). Amount of available habitat is tracked through Chequamegon NF Combined Data System (CDS). Population trends are tracked through yearly breeding waterfowl surveys accomplished by the Wisconsin Department of Natural Resources.
Habitat needed to meet management objective: Assuming one individual per 2.4 acres of suitable habitat, 5,568 acres of forest riparian habitat would meet management goals.
Current Habitat Availability: See Vegetation Table above. The 11,650 acres of lowland hardwood habitat and a portion of the 44,905 acres of lowland openings habitat provide the majority of suitable habitat.
Current Trend: In Wisconsin, wood duck are considered a common summer resident in the state (Robbins 1991). Rolley (2000) reported a highly significant increase in wood ducks in Wisconsin between 1983 and 1996. Howe and Roberts (2002) did not report population trends forwoodducks.



Brook Trout:
Preferred Habitat: Cold water streams and lakes.
Unit of Measure: Miles of suitable habitat.
Frequency of Measure: Annually, Wisconsin DNR personnel monitor selected stream segments. The majority of Forest streams are inventoried every ten years by Wisconsin DNR personnel.

Management Objective: The Chequamegon-NNF has a long history of cooperation in the management of the forest fishery with the DNR. Generally, forest and district biologists work with the DNR in collecting and sharing data. The DNR conducts periodic stream surveys, utilizing permanently established sampling stations, on each of the trout streams. Additionally, stream habitat surveys are conducted as well, such that when combined with the population estimates, a picture of a streams health is developed. Based on the data collected, habitat improvements are proposed if necessary. The primary focus of coldwater stream management is toward maintaining the health and viability of the entire coldwater stream community. Brook trout are the representative species for the coldwater community, and generally, if the habitat is healthy enough to support brook trout, then it usually supports other associated coldwater species as well. The objective of forest fisheries management is to provide and maintain coldwater conditions, ample spawning habitat and in-stream structure.

Potential Threats: Threats to organisms utilizing coldwater habitat include impacts that impede stream flow resulting in stream temperature increases, habitat alterations that increase in-stream sedimentation, the introduction of exotic plant and animal species that displace or disrupt the ecology of the native plant and animal community, and over fishing/harvest. Typically, these threats can be generated by construction of beaver dams, improperly placed culverts, poorly designed road crossings, or inadequate stream buffers during harvest treatments. Improperly designed in-stream improvements can also add to sedimentation, especially when hydrologic function is not adequately assessed. The threat of increased fishing pressure resulting in over harvest can be some what related to stream access, generally, as ease of access increases, so to does fishing pressure.

Current Habitat Availability: The WDNR classifies trout streams into three categories; Class I – stream conditions are such that trout populations are totally self-sustaining; Class II – stream conditions are suitable to support trout, except that natural reproduction is limited due to insufficient spawning habitat; and Class III – stream conditions are suitable to support trout only if stocked, since no spawning habitat is available. At the beginning of the planning period, the Lakewood/Laona Ranger District had identified approximately 519 miles of classified trout streams (LRMP Wildlife Documents, pg. 88), consisting of: Class I = 226.3 miles, Class II = 215.9 miles, and Class III= 76.8 miles.

Current Trend: Brook trout populations increased between 1986 and 1996 on the Chequamegon/NNF (End of Decade Monitoring Report, 1998) for several reasons. Habitat is improving. Over the last decade several policies have been implemented forest-wide to improve and maintain coldwater habitat. These include: no aspen regeneration within 300 ft. of class I and II trout streams to discourage beaver activity; the maintenance (since about 1994), of an active beaver management program on all Class I and selected Class II streams to maintain free-flowing through beaver dam removal; adoption of Wisconsin Forestry BMP's in 1995, which help protect and restore riparian areas next to all lakes and streams; implementation on selected streams of in-stream habitat improvement work; and since 1998, funding has been made available to repair road/stream crossings to reduce in-stream sediment accumulation. Fixing crossings on Class I and II trout streams has been a priority. Similar increases in brook trout populations have been noted on the Lakewood/Laona District (R.Heizer pers. comm.).

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