

REGIONAL FORESTER SENSITIVE SPECIES (RFSS)

Key Points

- Management activities on all projects in 2008 complied with 2004 Forest Plan direction for sensitive species.
- Projects either had no impact or were not likely to cause a trend toward federal listing or loss of viability on the Superior National Forest (SNF).
- Number of occurrences for some plant species has gone up since 2004, but most species of sensitive plants have about the same number of occurrences in 2008 as in 2004.
- Although sensitive plant habitat improvement projects typically do not affect many acres, monitoring shows they are contributing to Forest Plan viability goals and objectives.

A. MONITORING AND EVALUATION

Forest Plan Direction

This monitoring was conducted to address Forest Plan Objective: O-WL-18 Maintain, protect, or improve habitat for all sensitive species. Meeting this objective will involve two basic and complementary strategies that would be implemented based on species' habitat requirements and distribution, individual site conditions, expected management impacts, and other multiple use objectives. These strategies include: a. Landscape level (or coarse filter) management strategies: Addressing species' needs through integrated resource management at large landscape scales including, but not limited to: Landscape Ecosystem (LE) or Landtype Association scales for vegetation and management indicator habitat objectives; watersheds for aquatic and riparian condition objectives; and Management Areas for desired or acceptable levels of human uses. b. Site-level (or fine filter) management strategies: Addressing species' needs by managing specifically for high quality potential habitat or known locations of sensitive species and Forest Plan Objectives O-WL-19 through O-WL-30 address management for specific locations and habitat for wood turtle, boreal owl, great gray owl, black tern, three-toed woodpecker, olive-sided flycatcher, sensitive butterflies, sensitive fish, mollusks, and aquatic insects, goblin fern, and sensitive lichens.

Monitoring Conducted

Background

At the time the Forest Plan Final Environmental Impact Statement (EIS) was conducted, the Regional Forester Sensitive Species (RFSS) list was based on the 2000 list. In 2006, a formal update of this list was conducted and resulted in changes to species based on new information. Plant species added to the sensitive species list were linear leaved sundew, Appalachian fir clubmoss, the liverwort *Frullania selwyniana*, and Canadian rice grass. Black tern was removed because it no longer regularly nests on the Superior

9c.2 Regional Forester Sensitive Species (RFSS)

National Forest (SNF). Wilson's phalarope was removed because it only rarely occurs, mainly as a migrant. Habitat for either species is not at any risk from management activities. Quebec emerald, a dragonfly species, was added to the list when it was discovered on the SNF in 2006. This is the first record for the species in Minnesota. Finally, in 2007 the gray wolf and bald eagle were added when they were removed from the endangered species list by the Fish and Wildlife Service (USFWS). Appeals regarding delisting of the gray wolf were finalized with the decision in 2009 to delist the Great Lakes population.

Terrestrial Wildlife

The three primary ways that terrestrial animal RFSS were monitored are population monitoring, presence/absence detection, nest or den occupancy and breeding productivity surveys. Appendix G summarizes these methods and displays monitoring conducted for each species.

Landscape Level (Coarse Filter) Monitoring

Habitat conditions are monitored in several different ways that allow the SNF to address consistency with Forest Plan management direction to maintain, protect, or improve habitat for RFSS.

Indicators of habitat – such as management indicator habitats (MIH) for forest type and age spatial configurations, or non-forested wetlands (Figure 9c.1) are identified and the distribution and amount (acres) is measured. Most of these indicators are the same as those used in the 2004 Forest Plan Revision Biological Evaluation (BE).

Monitoring data are periodically updated during the year, especially for each of the landscape-scale vegetation management projects. This ensures that managers use the most up to date information for planning and analysis of potential impacts. To determine habitat trend and sufficiency, current or projected conditions were compared to the conditions at the time the Forest Plan EIS was conducted in 2004.

There are several species that do not have measurable indicators of habitat, such as peregrine falcon that use cliffs for nesting or Le Conte's sparrow and yellow rail that use generally unchanging non-forest habitat. For those species, habitat conditions are assessed by methods such as site visits to check habitat or aerial photo interpretation to determine suitability or the potential for impacts from management.

Site-Level (Fine Filter) Monitoring

Habitat is also monitored for some species at the site level. For example, known nests or breeding territories of northern goshawk, bald eagle, peregrine falcon, boreal owl (Figure 9c.2), great gray owl or wood turtle are revisited to check on condition and management impacts.

Evaluation and Conclusions

Landscape Level (Coarse Filter) Monitoring

Differences in Forest-wide (excluding the Boundary Waters Canoe Area Wilderness (BWCAW) amounts of habitat (for those species that the SNF has measurable habitat indicators) have been monitored and analyzed on a continual basis for each landscape - scale vegetation management project. The use of MIH has allowed landscape-scale monitoring of habitat used by a broad range of species, including many sensitive species. Large vegetation project planning incorporated previous monitoring of MIH and aimed to benefit RFSS whenever possible.

Since 2004, approximately 39 projects have been developed to implement the Forest Plan through 2008. Most of the nine landscape-scale vegetation management projects were designed, in part, to either benefit RFSS by maintaining or providing for future suitable habitat or to minimize potential negative impacts. A BE was conducted for all projects to determine impacts and all projects were either likely to impact individuals but not cause a trend toward listing or a loss of viability on the SNF or were expected to have no effect. All projects were in compliance with relevant Forest Plan management direction, including standards and guidelines.

Site-Level (Fine Filter) Monitoring

Local (Minnesota or SNF) population trends are available only for a few of RFSS including the following:

- Gray wolf and bald eagle: Both of these species have been recently delisted from federally threatened status under the Endangered Species Act because of significant increases in their populations over the last 30-40 years. For more detailed information on their status refer to the Management Indicator Species section.
- Black-throated blue warbler: This species has only recently been detectable during forest songbird monitoring (completed since 1991 on the Superior, Chippewa, and Chequamegon-Nicolet National Forests) on the SNF to meet the minimum abundance criteria. In 2007 the species had an increase of greater than nine percent from 1991. However, black-throated blue warblers occurred on 11 or fewer stands and their trend may be more susceptible to site-specific influences than other species.
- Peregrine falcon: In Minnesota between 1998 and 2007, the number of territorial pair and fledged young rose from 24 pair and 52 young to 52 pair and 94 young. Young per successful nesting pair was 2.7 in both 1998 and 2007. Minnesota's increasing population includes ten pair along the north shore of Lake Superior in Cook and Lake Counties (Table 9c.1). Though most of these are not within the boundary of the SNF, they are close and may use the SNF for foraging. One pair nesting within the SNF was active in 2007 and produced at least one young in 2008.

9c.4 Regional Forester Sensitive Species (RFSS)

Presence/Absence Monitoring

Key sources for presence/absence monitoring include project-specific SNF RFSS surveys, Minnesota Department of Natural Resources (MN DNR) county biological, wildlife, and non-game surveys along with natural heritage program studies, monitoring avian productivity and survivorship stations (MAPS), the Natural Resources Research Institute (NRRI) forest songbird monitoring program and USFWS breeding bird surveys.

Appendix C and D show differences in the number of known locations for 22 RFSS between 2004 (Forest Plan revision) and 2008. For species whose known sites are tracked in the MN DNR Natural Heritage Program (NHP), there have been an increasing number of locations for the following nine species: heather vole, northern goshawk, peregrine falcon, bald eagle, great gray owl, boreal owl, Laurentian tiger beetle, Nabokov's blue butterfly (Figure 9c.3) and Quebec emerald butterfly. There has been no change in number of sites for the following five species: yellow rail, Mancinus alpine butterfly, Jutta arctic butterfly, red-disked alpine and grizzled skipper butterfly.

There are still no known sites for sharp-tailed grouse.

Data for wood turtle nesting locations reflect a decrease in locations from eight to five, but it is difficult to tell the difference between individuals located and nest sites. The SNF does not believe there has been a decrease in nest sites since 2004. Naturally, sites are lost from vegetation growing on them but they are replaced by new sand points forming. One new nest site on the St. Louis River has been known since 2004. Five existing nest sites have been monitored on the SNF since 2007 and 40 individuals ranging in age from two to 48 years of age have been documented.

Species that are not tracked in the MN DNR NHP and for which the SNF does not have an adequate sample size to detect population trends include those that are so rare they will likely preclude the SNF from ever developing reliable population estimates. These species include the three-toed woodpecker and Le Conte's sparrow. Population trends for several other species, however, can be developed through the forest songbird monitoring program. These include Connecticut warbler, bay-breasted warbler and olive-sided flycatcher. In 2008 an additional 75 points, representing wetland habitat, were added to the forest songbird monitoring program. Currently the monitoring program provides us with information on documented sites and habitat associations.

Monitoring known nest sites of bald eagle, northern goshawk, peregrine falcon, and, occasionally, boreal and great grey owl has provided information on nest productivity. Though data are insufficient to fully understand reproduction dynamics, there are no known significant concerns.

Aquatic Wildlife

Monitoring Conducted

The two primary ways that aquatic RFSS are monitored include using physical or habitat indicators and directly monitoring populations and biological communities. These methods are effective tools at various spatial scales.

Landscape Level (Coarse Filter) Monitoring

Monitoring the proportion of upland open and upland young forest within each sixth level watershed is a useful landscape level tool for monitoring aquatic RFSS. This shows potential effects associated with vegetation management and other activities that are evident at the watershed scale. A proportion of upland open and upland young forest on all ownerships (less than 16 years old) of less than 60 percent of a sixth level watershed is considered acceptable to protect water quality and watershed health and, as a result, aquatic RFSS (Forest Plan p. 2-13, S-WS-1). This indicator can assess direct, indirect and cumulative effects at a watershed scale as management projects are considered. A full description of this monitoring effort can be found water resources section of this report.

Site-Level (Fine Filter) Monitoring

Monitoring the physical environment of aquatic systems is also implemented at a mid-level and site-level scale. This includes monitoring of reference reaches and stream crossings. Potential influences to aquatic RFSS from physical changes may include reduced survival resulting from sedimentation, degraded instream and riparian habitat, fish migration barriers and loss of stream connectivity. Monitoring of physical characteristics of aquatic environments is discussed further in the water resources section of this report.

Biological surveys at each reference reach are performed periodically to track potential changes in aquatic communities through time. This typically includes several years of pre-management monitoring and post-management monitoring. Analysis may also include comparisons among and between reference reaches as well as upstream and downstream site comparisons. These surveys are done at both mid-level scale and project (site-level) scale. Examples of these activities include snorkel surveys for RFSS mussels and electro-fishing or netting for RFSS fish species.

Evaluation and Conclusions

Landscape Level (Coarse Filter) Monitoring

At the watershed level (sixth level), no watersheds on the Forest reached the 60 percent threshold for upland open and upland young forest on all ownerships. This indicates that watershed scale disturbances are not likely to affect any aquatic RFSS. Refer to the water resources section of this document for further results and discussions on the physical monitoring at the landscape level.

Site-Level (Fine Filter) Monitoring

Comparisons of past (2006) physical reference reach information with data collected in 2008 at the same sites indicates minor changes in sediment composition, channel form and stream reach hydraulics. Each of these sites has seen no upstream management activities during the study period and the differences between the two years are a result of a combination of baseline (natural) variability and field methods/techniques variability. Refer to the watershed and riparian sections of this document for further discussions on the physical monitoring at the site-level. The physical monitoring at these sites suggests no impact to aquatic RFSS outside the range of natural variability.

Biological surveys of aquatic communities were completed in 2008. These biological surveys often include or target RFSS aquatic species, especially mussels (creek heelsplitter and black sandshell) during snorkel surveys (six reaches in 2008), northern brook lamprey during electro-fishing surveys (six sites in 2008), and lake sturgeon during a special netting study. A summary for each RFSS aquatic species follows:

- **Sensitive Freshwater Mussels:** Freshwater mussel communities were monitored using quantitative, timed snorkel surveys in two rivers in 2008; Dark River (four sites) and the upper St. Louis River (three sites). The Dark River surveys found creek heelsplitters in three of the four sites. Compared to a qualitative survey in 2001 (Anderson, 2002) at the same stream reaches in the Dark River, current findings indicate that relative abundance of the creek heelsplitter mussel is low, but stable (found in three of the four reaches). The three reaches surveyed in the upper St. Louis River indicate that black sandshell mussel relative abundance is very low, but most likely stable (found in one of three reaches).
- **Lake Sturgeon:** This aquatic RFSS has been monitored using a multi-agency study to determine population characteristics and habitat use in the Namakan Reservoir. Fifty-eight adult Lake Sturgeon were captured, measured, and released in May of 2008. Age structure, length, weight and tissue samples were taken from all fish; in addition 26 fish were implanted with acoustic transmitters (n=26) and blood samples were collected (n=48). Thirteen submersible receivers were positioned throughout the reservoir to track movements. In general, sturgeon spent more time (mean detections/fish) near tributary environments, particularly during the spawning period of May and June. Almost half of the transmitted sturgeon (11 of 26) moved from initial capture locations in May 2008 to the Namakan River/Little Eva Lake by the end of October 2008. Data suggest that sturgeon moved freely throughout the Namakan River system and represent a shared, international population. Other measures of population structure and function are forthcoming with further analysis. For more detailed information on preliminary results refer to the 2008 Progress Report (Shaw et al. 2008). Lake sturgeon populations within the Rainy River Watershed are considered stable and recovering (NatureServe 2008); distribution, abundance, and recovery status in other watersheds within the SNF is largely unknown. Potential recovery time is long due to slow growth rate and late maturation (NatureServe 2008).
- **Northern brook Lamprey:** Northern brook lamprey are sampled during stream electro-fishing in areas of suitable habitat. During routine electro-fishing,

individuals are rarely sampled because they are relatively uncommon compared to other fish species and there is limited sampling success due to sampling timing, species life history (individuals are often burrowed in stream sediments) and deficiencies in sampling methods. Even with these constraints, however; water bodies with known occurrences of individuals as indicated by the MN DNR NHP have been successfully and consistently sampled for northern brook lamprey (i.e., Dark River). This species is relatively rare but present and stable in streams with known occurrences in the recent past (less than 20 years).

- Shortjaw cisco: Shortjaw cisco was not a part of any Forest monitoring efforts in 2008. Data from the MN DNR NHP suggest no change in occurrence.
- Quebec emerald: The Quebec emerald dragonfly (*Somatochlora brevicincta*) is known to occur on the SNF (Wayne Steffens, personal communication, 2006). Due to habitat requirements and existing habitat conditions, it is possible that it occurs in other locations on the SNF as well. Although not specifically targeted, Odonate surveys in 2008 revealed no new occurrences of Quebec emerald dragonfly. Given high vagility (three miles/day; NatureServe 2006) and prevalence of suitable habitat over its range, the overall population is not considered fragile; localized extirpations would likely re-inhabit shortly after habitat recovery. The MN DNR NHP has not ranked this species and/or it is under determination.

Plants

Forest Plan Direction

This monitoring was conducted in an attempt to meet Forest Plan Objective O-WL-18, listed above, Forest Plan Objective: O-WL-30 Enhance or restore high-quality habitat on a minimum of 20 (average of two sites per year) known sites of sensitive plants. Priority for habitat improvement will generally be for those species and habitats for which: a. proactive management (versus protection based on avoidance of any management activities) is needed to maintain species and b. coarse filter management does not provide adequate maintenance or restoration.

Monitoring Conducted

Landscape Level (Coarse Filter) Monitoring

At the coarse filter level, most sensitive plants on the SNF do not have indicators that would allow meaningful monitoring. These species use habitats such as cliffs or rock outcrops, marshes, fens, fluctuating shorelines and other specialized habitats that are not readily captured in forest inventory data and do not change much over time. Some sensitive plants however, such as those found in forested wetlands and forested uplands, do have indicators that are based on forest type and stand age. For this coarse-filter analysis, see the MIH section of this report.

Site-Level (Fine Filter) Monitoring

In 2008, fine-filter monitoring for sensitive plants included presence/absence monitoring of known sites in the Toohey and Tracks project areas and analysis of the DNR MN NHP data. For mid-scale assessments, an attempt was made to visit known sensitive plant sites in project areas during their flowering season to confirm whether the populations still exist. The second fine-filter analysis involved summarizing the number of known occurrences of sensitive plants within SNF boundaries by examining MN DNR NHP data. These numbers were compared to 2004 data to determine if population numbers have changed over time.

Another type of fine-filter monitoring is for sensitive plant habitat improvement projects. Two such projects were completed in Fiscal Year (FY) 2008 which included the removal of encroaching brush and saplings at the Spruce Road large-leaved sandwort (*Moehringia macrophylla*) site (Figure 9c.4) and removal of duff and downed trees at the Fishfry Lakes auricled twayblade (*Listera auriculata*) site. At the auricled twayblade site, the SNF conducted a pre-treatment population census that totaled 76 plants (Figure 9c.5). Post-treatment monitoring will be conducted at both sites in 2009.

Follow up monitoring was conducted in 2008 for a habitat improvement project completed in 2007 at Tony Lake for the RFSS *Botrychium*. Encroaching shrubs and trees were removed in 2007. Prior to treatment, 71 rare *Botrychium* plants were present. One summer after the treatment, 1 rare *Botrychium* was present, and after the second summer, 2 rare *Botrychium* plants were present (see explanation for decline below).

Evaluation and Conclusions

Landscape Level (Coarse Filter) Monitoring

For some RFSS plants (American shoregrass occurring in shallow water along the shorelines of lakes), no indicators exist that permit coarse filter monitoring. The areas of these microhabitats are difficult to measure but typically don't change much over time. These species can, however, be monitored with fine filter monitoring (see below). For RFSS plants of forested wetlands, northern hardwoods, and dry to mesic forested uplands, indicators do exist that allow for coarse filter monitoring. For this coarse-filter analysis, see the MIH section of this report.

Site-Level (Fine Filter) Monitoring

Of the 10 sensitive plant populations that were searched for, six were found, all of them in the Toohey project area. Three separate populations of the RFSS small shinleaf (*Pyrola minor*) (Figure 9c.6) were relocated, as was one population of barren strawberry (*Waldsteinia fragarioides*) (Figure 9c.7) and two populations of RFSS moonwort species (*Botrychium*). Of the four species that were not relocated, one was probably shaded out as trees and shrubs encroached on the site (i.e., succession) and one was probably eradicated by county road maintenance (it had been growing in a roadside ditch). Overall, having six out of 10 populations still present is encouraging and shows the SNF is meeting Forest Plan direction.

The other fine filter evaluation involved comparing known RFSS plant occurrences between 2004 and 2008 using MN DNR NHP data. During 2008, Forest Plan direction for sensitive plants (O-WL-18) was being met. For a number of the sensitive plants (i.e. northern bur reed (*Sparganium glomeratum*) or the RFSS liverwort *Frullania selwyniana*), there was a notable increase in the number of known occurrences since 2004 (RFSS Plant Fine Filter Analysis). This is primarily due to increased search efforts made in the last few years. For the rest of the sensitive vascular and non-vascular plants, the number of occurrences remained nearly the same between 2004 and 2008. Known occurrences of sensitive plants within SNF boundaries are tracked by MN DNR NHP.

Monitoring of the Tony Lake *Botrychium* habitat improvement project has proven inconclusive so far. However, in general, these projects are contributing to the accomplishment of Forest Plan objective O-WL-30. So far, six RFSS plant habitat improvement projects have been implemented since the Revised Forest Plan was approved. The number of projected habitat improvements to be completed by 2014, the end of the first decade of the Forest Plan, is 20.

There are a number of factors that could be responsible for the decline in the Tony Lake *Botrychium* population. These include the weather (*Botrychium* population levels can fluctuate greatly from year to year depending on whether it is a dry or wet year), non-native invasive species (a population of the non-native reed canary grass (*Phalaris arundinacea*) expanded quite a bit in the two years since monitoring began and could be competing with the *Botrychium*) or SNF treatments themselves.

B. REFERENCES

- Anderson, L. P. 2002. Results of a qualitative mussel survey on the Dark River, St. Louis Co., Minnesota. Report to the Superior National Forest, Duluth, MN. 3pp.
- NatureServe. 2009. Available: <http://www.natureserve.org/explorer/>
- Shaw, S., S. Chipps, D. Willis, S. Windels, and D. Mcleod. 2008. Lake sturgeon population characteristics, movements, and habitat use in the Namakan Reservoir. 2008 Progress Report. 8pp.

9c.10 Regional Forester Sensitive Species (RFSS)

Table 9c.1. Peregrine falcon nesting in northeastern Minnesota from 1988 through 2007¹.

Site	County	First Nest	Young
Crow Creek	Lake	2003	8
Corundum Point, Split Rock SP	Lake	1997	24
Gold Rock Point, Split Rock SP	Lake	2007	1
No. Shore Mining	Lake	1999	23
Tettegouche SP	Lake	1988	53
Birch Bay	Lake	2006	6
Kennedy Creek	Lake	1995	15
Manitou cliff	Lake	1999	16
Butterwort	Cook	2008	1
Clearwater Lake	Cook	2007	1
Hat Point Cliff	Cook	1996	14

Figure 9c.1. Great gray owl in winter hunting habitat.



Figure 9c.2. Boreal owl (Photo by Steve Wilson).



Figure 9c.3. Female Nabokov's blue butterfly.



9c.12 Regional Forester Sensitive Species (RFSS)

Figure 9c.4. Brush removal at the Spruce Road large-leaved sandwort (*Moehringia macrophylla*) site on the Superior National Forest.



Figure 9c.5. Auricled twayblade (*Listera auriculata*) at the Fishfry Lake site on the Superior National Forest.



Figure 9c.6. Small shinleaf (*Pyrola minor*), a sensitive plant found in the Toohey project area on the Superior National Forest.



Figure 9c.7. Barren strawberry (*Waldsteinia fragarioides*) in the Toohey project area on the Superior National Forest.

