

WILDLIFE: REGIONAL FORESTER SENSITIVE SPECIES (RFSS)-AQUATIC

(1) Overview

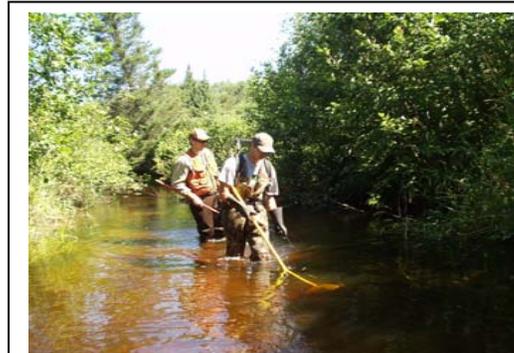
The Superior National Forest completed and/or initiated several habitat restoration and population monitoring projects in 2005 that directly benefited Regional Forester Sensitive Species (RFSS) including creek heelsplitter mussels, black sandshell mussels, northern brook lamprey, and lake sturgeon. Several of these projects were designed to address multiple Forest Plan monitoring objectives as well as included multiple partnerships and collaborators. Below is a summary of each project.

Dark River Stream Habitat Restoration

The purpose of the Dark River Habitat Restoration Project was to improve stream habitat conditions for RFSS including black sandshell mussel, creek heelsplitter mussel, northern brook lamprey, and lake sturgeon as well as eastern brook trout, an important game fish species. Increased stream cover resulting from the placement of ninety-four large woody debris cover logs and planting of 3,000 black and white spruce seedlings within the one mile project reach will aid in restoring in stream channel and riparian habitat conditions as well as benefit populations of RFSS and brook trout. The Forest Service and volunteers from Trout Unlimited inventoried habitat improvement structures, established long-term monitoring sites, and documented existing stream channel conditions. The Minnesota Department of Natural Resources, Trout Unlimited, Fond Du Lac Band, and youth from Laurentian Environmental Center cooperated to evaluate fish and invertebrate populations as well as collected baseline water quality information. It is anticipated that established monitoring stations and baseline data collected in 2005 will be used to monitor the long-term success of this habitat restoration project and the benefits to RFSS.



Habitat structure monitoring site



Dark River fish population surveys.

Road Stream Crossing Improvements

Road/stream crossing improvements have occurred on the Superior National Forest for several years. It was not until recently that these improvements were designed to restore watershed conditions, stream habitat, and fish passage for RFSS and/or their host fish species. During the last few years, efforts have been made to train employees to design new road/stream crossings to provide for stream simulation conditions, thus promoting fish passage and improving RFSS habitat. In 2004 and 2005, fisheries, watershed, and engineering staff cooperated in designing and planning road/stream crossing improvements to improve fish passage at four locations on the Forest including Inga Creek and three Dark River tributary stream crossings. Coarse level surveys, geographic information, and roads data were initially used to identify, survey, and prioritize road/stream crossing improvement sites. Fisheries and engineering staff cooperated to complete site-specific stream channel and engineering surveys to assist with project design and contract preparation. Road/stream crossing structure replacement and habitat restoration efforts included installing properly sized culverts and grade control structures. Future road/stream crossing improvement monitoring will utilize the Coarse Level Culvert Survey and San Dimas Fish Passage Protocols to monitor the success of each project and benefits to RFSS and habitats.



Removal of inadequate road/stream crossing .



New main channel and overflow culverts.

Reference Reach and RFSS Monitoring Surveys

Stream reference reaches were established on the Superior National Forest in 2005 to begin long-term monitoring of stream water quality, stream channel and habitat conditions, Regional Forester Sensitive Species (RFSS) populations, and important game and non-game fish species. Reference reaches were located within watersheds based on existing or proposed management activities and habitat restoration projects or to obtain information for mid-level project areas. Electrofishing surveys were conducted within established reference reaches to determine fish species diversity and abundance. Snorkel surveys were also conducted within survey reaches to determine presence /absence and relative abundance of RFSS mussels.

In 2005, stream channel reference reaches were established at 28 sites in 13 streams and rivers on the Forest including the Dark River, Leander Creek, McNiven Creek, Slow Creek, West Knuckey Creek, Murray Creek, Langley River, Cloquet River, West Split Rock River, Nester Creek, Kadunce Creek, Elbow Creek, and Kimbal Creek. Although several fish species were observed during electro-fishing surveys, northern brook lamprey were only documented in the Dark River. Long-term monitoring at established reference reaches is planned to occur every 3-5 years. It is anticipated that these monitoring efforts will provide important information on the status of stream habitats, RFSS, as well as important game and non-game fish species.

Fisheries and Aquatics Program Staff also initiated monitoring in 2005 to identify and locate populations of RFSS mussels on the Forest. Survey and monitoring locations were identified based on known observations or likely occurrences in suitable lake and stream habitats. Survey crews conducted 200 meter wading and/or snorkel surveys at identified locations. Additional line intersect transect surveys were conducted when RFSS mussels were located within survey reaches. Mussels encountered during the surveys were identified, measured, aged, recorded, and returned to the water. In 2005, 17 mussel surveys occurred in 11 streams. Creek heelsplitter mussels were identified at two locations. Permanent transects and/or survey areas were established at these locations to monitor relative abundance and status of each population. Future monitoring efforts are planned to occur annually to identify additional populations and every 3-5 years at established monitoring sites.



Mussel snorkel survey along transect.



Measuring length of creek heelsplitter mussel.

Coarse Level Stream Crossing Surveys

The Superior National Forest Fisheries and Aquatics Program also inventoried road/stream crossings on the Forest in 2005. Information collected during these surveys included culvert measurements, condition assessments, approach conditions, stream geomorphology, and fish passage data. This information will be used to prioritize future stream crossing and stream habitat restoration projects that will promote RFSS and habitats well as quality native and desired aquatic species habitat. In 2004, fish passage assessments occurred at ten road/stream crossings to identify and document barriers to fish migration. Assessment of culvert dynamics using the San Dimas Protocol included measurement of culvert dimensions, inlet and outlet slopes, channel widths, culvert substrate, and culvert perches.

Analysis included a GIS layer of fish species distribution and impact analysis for individual watersheds. In 2005, the Forest completed road /stream crossing assessments at 63 locations within the Devil Trout, Whyte, and Mid-Temperance Project Areas following a standardized Coarse Level Inventory Protocol. It is anticipated that this same protocol will be utilized annually to evaluate road/stream crossings as well to begin monitoring recently constructed road/stream crossing improvement projects.



(2) Monitoring Activities

Monitoring Question

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

Monitoring Driver(s): Objective O-WL-28. Sensitive Fish, Mollusks, Aquatic Insects In all known sites and breeding locations, enhance, or restore high quality habitat for these species primarily by implementing management direction that promotes desired conditions for healthy and functional watersheds, riparian areas, and vegetation AND **O-WL-29.** Additionally, during evaluation and restoration of one to two 5th level watersheds per year, known locations of the following sensitive aquatic species will provide priority areas for proactive management to improve habitats: Lake sturgeon, Shortjaw cisco, Northern brook lamprey, Creek heelsplitter, and Black sandshell..

Applicable Monitoring Activity, Practice, Or Effect Measured	Methods	When Monitored	Location or Project Area
Does proposed management within individual project areas address known RFSS populations and habitat? Do stream crossings, riparian management, and stream habitat improvement projects benefit known RFSS populations or sites?	<p>Stream Reference Reaches – Monitor water quality, stream habitat, and channel conditions within established reference reaches that are known to support or contribute to RFSS populations.</p> <p>RFSS Monitoring Surveys –Identify and establish long-term monitoring stations at known locations. Monitor status of each population every 2-5 years.</p> <p>Habitat Restoration Projects –Continue designing and implementing stream and lake habitat restoration projects that benefit RFSS and habitat. Monitor success of each project and benefits to existing RFSS populations.</p> <p>Road/Stream Crossing Improvements – Continue designing and construction new road/stream crossing projects that improve stream flow, sediment transport, and RFSS habitat as well as fish passage. Monitor success of each road/stream crossing project and benefits to RFSS and/or their host fish species every 3-5 years.</p> <p>Riparian Management – Conduct riparian management activities that benefit RFSS and/or habitat. Utilize post vegetative treatment monitoring to evaluate identification and implementation of near-bank and remainder zones.</p>	<p>June-August</p> <p>June-August</p> <p>July-September</p> <p>July-September</p> <p>June-September</p>	<p>Initiate stream reference reach and RFSS populations monitoring in recent or current mid-level project areas or known RFSS locations.</p> <p>Implement and complete habitat restoration and road/stream crossing improvement projects within NEPA Project Areas or as opportunity projects when funding is available.</p> <p>Riparian management areas should be identified within mid-level project areas. Locations may be treated as opportunity areas or included in the proposed activity for mechanical or hand vegetative treatment.</p>

(3) Evaluation and Conclusions.

Desired Conditions/Objectives

Monitoring Driver(s): Objective O-WL-28. Sensitive Fish, Mollusks, Aquatic Insects In all known sites and breeding locations, enhance, or restore high quality habitat for these species primarily by implementing management direction that promotes desired conditions for healthy and functional watersheds, riparian areas, and vegetation AND **O-WL-29.** Additionally, during evaluation and restoration of one to two 5th level watersheds per year, known locations of the following sensitive aquatic species will provide priority areas for proactive management to improve habitats: Lake sturgeon, Shortjaw cisco, Northern brook lamprey, Creek heelsplitter, and Black sandshell..

2005 Accomplishment - 2004 and 2005 Accomplishments

- Improved RFSS habitat in Dark River with placement of ninety-four large woody debris cover logs and planting of 3,000 black and white spruce seedlings within a one mile project area.
- In 2004 and 2005, fisheries, watershed, and engineering staff cooperated in designing and planning road/stream crossing improvements to improve fish passage at four locations on the Forest including Inga Creek and three Dark River tributary stream crossings.
- In 2005, stream channel reference reaches were established at 28 sites in 13 streams and rivers on the Forest including the Dark River, Leander Creek, McNiven Creek, Slow Creek, West Knuckey Creek, Murray Creek, Langley River, Cloquet River, West Split Rock River, Nester Creek, Kadunce Creek, Elbow Creek, and Kimbal Creek.
- In 2005, 17 mussel surveys occurred in 11 streams. Creek heelsplitter mussels were identified at two locations. Permanent transects and/or survey areas were established at these locations to monitor relative abundance and status of each population.
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2005 Accomplishment Contribution Towards Desired Conditions & Objectives

A. FOREST PLAN DIRECTION/FEIS CONDITION				
Record of Decision (7/04)	(DECADE 1)		2005 Accomplishments and/or Condition	
Existing Condition	FP Desired Condition, Objective, or S&G's	FEIS Projected or Proposed Condition	Actual Accomplishments implemented	Actual Accomplishments & Approved NEPA Decisions
Habitat Restoration and road/stream crossing improvements were not always designed to restore RFSS habitat and fish passage. RFSS monitoring was limited to only a few studies and MNNHD Information.	Maintain, Protect, or improve habitat for RFSS. Minimize negative effects to RFSS Restore high quality habitat for RFSS Evaluate & restore 1-2 5 th level watersheds per year. Protect known RFSS mussel beds	Restore 1-2 5 th level watersheds that will benefit RFSS each year.	One mile of direct stream habitat improvement in the Dark River. Four road stream crossing restoration projects that improve RFSS habitat. Reference reaches were established at 28 sites on 13 streams to monitor water quality, stream channel, & stream habitat conditions. Mussel surveys and monitoring at 17 locations. Permanent monitoring sites were established. Road/stream crossing inventories at 10 & 63 sites in 2004 and 2005, respectively, to evaluate fish passage, stream flow, & sediment transport.	Dark River Stream Habitat Improvement Project CE Multiple stream crossing restoration projects completed under Road Maintenance.

B. ACHIEVEMENT OF FOREST PLAN DIRECTION/FEIS CONDITION			
% Achievement of Decade 1 Direction/Condition		Trend	
Actual accomplishments implemented	Actual Accomplishments & Approved NEPA Decisions	Actual accomplishments implemented	Actual Accomplishments & Approved NEPA Decisions
100%	100% Accomplishment of Approved NEPA Decisions.	Positive	Positive trend as a result of implementation the Dark River Stream Habitat Improvement and multiple stream crossing restoration projects.

Standards and Guides

Standard & Guide Descriptor	Standard & Guide Description	Compliance	Remarks
G-WL-11	Avoid or minimize negative impacts to known occurrences of sensitive species.	YES	Incorporating mitigation features into proposed actions that protect known populations, habitat, and riparian areas. -Initiated additional surveys to identify other populations on the Forest in 2005.
G-WL-12	Minimize negative impacts to known sensitive species from management activities that may disturb pairs in their breeding habitat during critical breeding season (varies by species). Meeting G-WL-11 and -12 will involve diverse management approaches that depend on species' habitat requirements and distribution, individual site conditions, and expected management impacts. These include two basic and complementary strategies: a. Landscape level or coarse filter management strategies may allow negative modifications of some portions of sensitive species habitat as long as overall objectives for habitat amount, quality, and distributions are generally met. b. Site level or fine filter management strategies may warrant protections of known individual sensitive species locations or high quality potential habitat.	YES	Incorporating mitigation features into proposed actions that protect known populations, habitat, and riparian areas. -Initiated additional surveys to identify other populations on the Forest in 2005.
S-WL-5	If negative impacts to sensitive species cannot be avoided, management activities must not result in a loss of species viability forest-wide or create significant trends toward federal listing.	YES	Incorporating mitigation features into proposed actions that protect known populations, habitat, and riparian areas. -Biological evaluations are completed for each proposed management action.
S-WL-8	Prohibit the harvesting of sensitive and State listed threatened and endangered plants. Exceptions may be made for scientific research purposes or in fulfillment of treaty rights.	YES	Need to increase awareness on the Forest for aquatic RFSS. Current aquatic RFSS surveys may collect voucher specimens for identification purposes.
S-WS-4 & 36 CFR 219.12(k)	Water quality Best Management Practices, which are represented by some of the MN Forest Resources Council (MFRC) Voluntary Site Level Forest Management Guidelines, will be implemented as standards on NFS land. Refer to guideline G FW-1 for a discussion of the overall relationship between MFRC site level guidelines and the management direction established in this Forest Plan.	Yes	Good, based on current and past audits by MFRC and observations of SNF timber sale administrators
S-WS-5	New facilities (such as roads, trails, campsites, and buildings) within riparian or flood prone areas will be discouraged If such facilities are built in riparian or flood prone areas, they will be constructed and maintained in a way that minimizes adverse impacts to the ecological function of the area.	Yes	Good
S-WS-6	Management activities involving heavy equipment crossing (by road, trail, or skid trail) of any stream or drainage ditch, or operations on the immediate shoreline of any lake or open water wetland will be designed and conducted in a way that: a. Limits the number of crossing locations to the absolute minimum needed to conduct the activity b. Maintains or improves	Yes	Good

Standard & Guide Descriptor	Standard & Guide Description	Compliance	Remarks
	channel stability (dimension, pattern and profile) or shoreline stability in the affected or connected waters c. Uses filter strips as directed by Forest Plan guideline G-WS-4 and MFRC site level guidelines.		
S-WS-7	When removing beaver dams or other channel obstructions from streams, control hydrologic discharge to minimize the potential for downstream flooding, sedimentation, and associated impacts on channel morphology and habitat, including wild rice beds.	Yes	Good
S-WS-8	On lakes and wetlands where the Forest Service controls the discharge of water, minimum flow will be established to minimize impacts on downstream resources.	Yes	Good, but limited applicability.
G-WS-4	On slopes averaging 18% or steeper, the width of filter strips adjacent to lakes or streams will be either 150 ft. from the ordinary high water mark, 150 ft. from the bank full elevation, or the width of the entire slope that is adjacent to the water's edge, which ever is greater. Exceptions to filter strip guidelines are allowed for projects specifically designed for stream, lakeshore, or wetland restoration.	Yes	Good, but warrants more focused monitoring
S-WS-9	Within the near-bank zone, harvest trees only to maintain or restore riparian ecological function.	Yes	Early indications based on project planning and design features suggest good compliance. Initial compliance favors harvest exclusion more so than proactive treatment
S-WS-10	Within the near-bank zone, do not deposit debris or spoils from maintenance, construction, or dredging. However, depositing materials for habitat improvement or restoration is allowed.	Yes	Good, but warrants more focused monitoring
G-WS-6	Within the near-bank zone, minimize soil disturbance and avoid activities that may destabilize soils or add sediment to the water.	Yes	Good, but warrants more focused monitoring
G-WS-7	Within the near-bank zone, minimize mowing or any other activity involving intensive removal of under story vegetation.	Yes	Too early to evaluate.
S-WS-1	Management actions on NFS land will not increase the total (all ownerships) acreage of upland young forest (<16 years), and upland openings to the point where the combined acreage exceeds 60% of the total area of any 6th level watershed. Upland openings include permanent openings, roads and associated clearings, parking lots, cropland, pastures, borrow pits, utility rights of way, town sites, homes and yards, and upland brush, and grass. In 6th level watersheds that already exceed the 60% threshold, no action on NFS land will be taken that causes a net whole watershed increase of more than 1% in open and young forest conditions.	Yes	Good
S-WS-2	Excavated soil material, construction debris, spoils or debris from dredging projects, and debris and soil moved from upland sites during timber management activity (such as timber harvest, shearing or brush raking) will be deposited or spread out in upland locations. Stabilize soil deposited in this manner with vegetation.	Yes	Good
S-WS-3	Salvage & reuse topsoil for site rehabilitation during construction projects or other land use activities. When topsoil is unsuitable for reuse, other methods or tools such as sodding, hydro-seeding, fertilization, or erosion-resistant matting may be used to rehabilitate disturbed areas.	Yes	Good
G-WS-1	Restore eroded sites employing natural-appearing stabilization materials. Native species will be used in the restoration of vegetative cover. Nonnative annuals may be used as nurse crops to obtain rapid stabilization while slower growing native species are becoming established.	Yes	Good
S-WS-11	Activity fuels will not be pushed into windrows that encircle wetlands.	Yes	Good, but warrants more monitoring
S-WS-12	Natural wetlands will not be used for sewage disposal for administrative purposes, unless for research to develop operational guidelines or after such guidelines are established.	Yes	Good, but no such proposals were made.

Standard & Guide Descriptor	Standard & Guide Description	Compliance	Remarks
G-WS-12	Use of wetlands under frozen conditions for temporary roads and skid trails will generally be permitted as long as no fill is placed in the wetland. These roads or trails will be blocked to discourage vehicle use under unfrozen conditions.	Yes	Good, but warrants more focused monitoring
G-WS-13	Wetland impacts will be avoided whenever possible. Where impacts are unavoidable, minimize and compensate for loss when undertaking projects.	Yes	Good
S-WS-13	Where utility rights-of-way are constructed across wetlands, the crossings will be designed and maintained to preserve hydrologic and riparian function.	Yes	Good
G-WS-14	Avoid felling trees into non-forested wetlands, except where done for purposes of habitat restoration.	Yes	Good, but warrants more focused monitoring
G-WS-15	Wetlands will be managed to prevent the reduction of their water quality, fish and wildlife habitat, and aesthetic values. Management actions will not reduce water quality within a wetland, or upstream or downstream of a wetland, unless restoration of natural conditions is the primary goal of the activity.	Yes	Good, but warrants more focused monitoring

(4) Necessary Follow-up and Management Recommendations

Monitoring Driver	Follow-up Actions
O-WL-28 and O-WL-29	Long-term monitoring at established reference reach sites and stream cross sections should occur at established random sites at least once every 3-5 years. Need to include water chemistry data collection in 2006 and in the future.
	Continue establishing stream reference reach monitoring sites. Need to include water chemistry data collection in 2006 and in the future. Need to formally establish lake and wetland monitoring sites as well as monitoring protocols.
	Continue survey and inventory efforts to identify individuals and populations of RFSS on the Forest as well as continue establishing long-term RFSS population monitoring sites.
	Continue identification and implementation of road/stream crossing and habitat improvement projects that benefit RFSS populations, habitat, and riparian areas.
	Initiate monitoring program to evaluate road/stream crossing improvement projects in 2006. This monitoring program would utilize the Coarse Level Culvert Survey Protocol and established stream cross sections and longitudinal profiles. A formal monitoring protocol should be developed in 2006.
	Monitor compliance with FP standards and guidelines as well as mitigation measures for individual road and trail construction projects. Work with SNF engineering, timber, watershed, and fisheries and aquatics staff to ensure that project designs and construction contracts include appropriate design criteria. Report on individual project compliance annually. A formal monitoring protocol should be developed by watershed, fisheries and aquatics, and engineering staff in 2006-2007.
	Road/stream crossing and stream habitat restoration projects should be monitored at least once every 3-5 years. Need to institute post-project monitoring to evaluate success/effectiveness of each project. Protocols initiated in 2005 will be further refined and adopted in 2006 and 2007.
	Monitoring associated with the Dark River Habitat Restoration Project should occur every 3-5 years beginning in 2006.
	See Management Recommendation for riparian vegetation management in the Riparian-Aquatics Section.
See Management Recommendation "multiple WS standards and guidelines" in the Riparian-Aquatics Section.	

Monitoring Driver	Follow-up Actions
	A lake habitat monitoring protocol should be developed for the Forest that includes lake habitat, fish population and water quality parameters.
	Coordinate with Forest GIS specialists to update the upland young/upland open analysis for the entire Forest every three years. This should be initiated in 2006 or 2007.
	Continue to coordinate with State and Tribal agencies to conduct fishery assessments as well as share fishery information.
	There is a need to update the upland young/upland open analysis for the entire Forest every three years. Existing information is based on 10-12 year-old data. This information should be revised to assist with RFSS Biological Evaluation Analyses as well as other NEPA watershed analyses
	Continue to coordinate future mussel surveys with MNDNR –Ecological Services Division
	Presence/absence information for aquatic RFSS is currently limited. It will be important to continue support of survey and inventory efforts to identify individuals and populations of aquatic RFSS on the Forest as well as to continue establishing long-term aquatic RFSS population monitoring sites.
	Historical road stream crossing and stream habitat improvement projects were not all designed to improve aquatic habitat conditions for RFSS. The Forest needs to continue identifying, designing, and implementing road/stream crossing and stream habitat improvement projects that will directly or indirectly benefit aquatic RFSS populations and habitat.
	The Forest has not proactively managed riparian areas and habitat in the past. There is a need to strongly encourage a mindset change in NEPA teams to ensure that vegetation management decisions include proactive riparian management which benefits aquatic conditions and RFSS
	There is a need to design a systematic monitoring protocol to evaluate implementation of the Watershed Standards and Guidelines to ensure adequate protection of RFSS and habitat.

(5) Collaborative Opportunities To Improve Efficiency And Quality Of Program

Collaborator/Partner	Monitoring Activity	Accomplishment
MNDNR – Fisheries Division	Continue fish population surveys.	Ongoing
MNDNR – Ecological Services Div	Continue RFSS mussel surveys.	Occurred in 2005. Plan to continue coordinated mussel monitoring in 2006.
MNDNR Natural Heritage Survey	Provide updated heritage survey data annually. Cooperate with Forest to provide accurate RFSS occurrence information.	Ongoing annual.
Trout Unlimited	Continued habitat restoration Partnerships in Dark and Sturgeon River watersheds.	Ongoing. Completed 2005 Dark River Project. Dark River partnership will continue in 2006-2007 with other partners including MNDNR and Tribes.
Natural Conservancy	Continue stream/road crossing and watershed improvement activities in Sand Lakes Seven Beavers Area.	Ongoing. Plans for 2006 include four road/stream crossing improvements.