

WATERSHED HEALTH, RIPARIAN, AND SOILS (WS); WATERSHED, RIPARIAN, & AQUATICS

(1) Overview

Reference Reach and Coarse Level Stream Crossing Surveys

Stream reference reach and coarse level stream crossing surveys have occurred on the Superior National Forest since 2002. Recent survey and monitoring efforts have been standardized to address specific Forest Plan monitoring objectives for watershed health and riparian areas. Reference reach and road/stream crossing monitoring is now being designed to identify standardized monitoring locations as well as collect information on stream water quality and channel conditions, road/stream crossing improvements, and stream habitat restoration projects.

In 2004, stream geomorphology monitoring stations were established within four reference reaches in the Echo Trail Project Area. These stations will assist in providing necessary information to monitor stream geomorphology changes resulting from the installation of traditionally designed road crossings that may or may not be adequate for both stream flow and sediment transport. Stream temperature monitoring stations were also established within 10 project stream reaches to determine temperature regimes that will aid in developing management goals for specific watersheds.

In 2005, stream channel reference reaches and biological monitoring stations were established at 28 sites in 13 streams and rivers 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. Long-term monitoring at these established reference reach sites is planned to occur every 3-5 years depending upon proposed National Forest management activities, Regional Forester Sensitive Species information needs, and/or environmental conditions that require additional monitoring data.

Road/stream crossings were also inventoried on the Superior National Forest in 2004 and 2005. Information collected during these surveys included site information, culvert measurements, condition assessments, approach condition, stream geomorphology, fish passage assessment, and photo documentation. This information will be used to prioritize stream crossing and stream restoration projects that will promote quality native and desired aquatic species habitats in the future. 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; beginning in 2006, to monitor recently constructed road/stream crossing improvement projects.



Stream reference reach cross section survey.



Existing road/stream crossing in Echo Trail

In 2004, fish passage assessments occurred at ten road/stream crossings on the Superior National Forest 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. Information will also be used in the analysis of fish passage for regional trends in combination with data from other Forests in the Region. It is anticipated that this methodology will be used with the Coarse Level Culvert Survey Protocol; beginning in 2006 or 2007, to evaluate and monitor success of recently completed road/stream crossing improvements on the Forest.



Potential fish migration barrier



Existing culverts provide fish passage.

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, stream flow, sediment transport, and fish passage in addition to repairing and/or replacing existing road structures. During the last few years, efforts have been made to train employees to design new road/stream crossing structures to address natural stream simulation conditions and promote adequate fish passage when possible.

In 2004 and 2005, fisheries, watershed, and engineering staff cooperated in designing and planning road/stream crossing improvements to improve stream simulation and 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. Superior National Forest fisheries and engineering staff cooperated to complete site-specific stream channel and engineering surveys to assist with project design and contract preparation. Local equipment contractors were utilized to complete the stream crossing improvement projects at each location. Structure replacement and habitat restoration efforts included installing properly sized culverts and grade control structures. Future road/stream crossing improvement monitoring efforts will utilize the Coarse Level Culvert Survey and San Dimas Fish Passage Protocols to monitor the success of each project.



Dark River Habitat Restoration Project

The purpose of the Dark River Habitat Restoration Project was to improve stream habitat conditions for Regional Forester Sensitive Species (RFSS) including black sandshell mussel, creek heelsplitter mussel, northern brook lamprey, and lake sturgeon as well as eastern brook trout. The project was also designed to improve angler access opportunities and existing trail and parking facilities. 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 in a one mile stream reach will aid in restoring in stream channel and

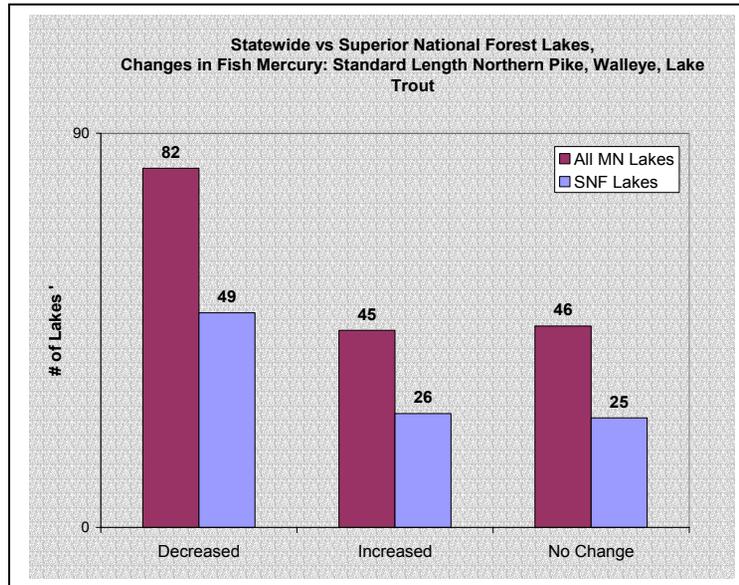
riparian habitat conditions as well as benefit populations of RFSS and brook trout. Following project completion, the Forest Service and volunteers from Trout Unlimited inventoried habitat improvement structures, established long-term monitoring sites, and documented existing stream channel conditions. 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.



Lake Water Chemistry

In 2004 and 2005 the Forest monitored the chemistry of over a dozen lakes to look for changes that could affect the aquatic ecosystem. Some of this work was part of a Joint Fire Sciences Program (JFSP)-funded study that addresses the following question: Does the BWCAW prescribed burning program affect lake chemistry and is there any associated change in the amount of mercury in fish? Data collection for this program was done in FY '04 and FY '05 and a preliminary report is expected in 2006. In addition to the JFSP study, about ten additional lakes were sampled as part of a program to track long-term trends in lake chemistry across the forest.

Mercury in Fish



In continuation of the partnership initiated in 1989, the Forest worked with the MN DNR again in FY 2005 to capture and analyze fish from over a dozen Forest lakes as a part of the overall state fish contaminant monitoring program. The DNR's database goes back to the late 1970's and covers hundreds of lakes across the state. The database allows the examination of trends in fish mercury through time and across the landscape. Using this data the MPCA recently statistically analyzed fish from lakes on the forest that were sampled multiple times over multiple years (see graph) and found that about half of the lakes contained fish that decreased in mercury content over time, about one-quarter increased, and about one-quarter didn't change. This ratio was approximately the same as the overall statewide dataset.

Mercury in Loons

A team of Bio-Diversity Research Institute (BRI) biologists worked with USDA Forest Service staff and volunteers to capture and sample breeding loons on the Superior National Forest over a two-week period in the summer of 2005. Capture focus was on adult loons accompanied by chicks. Loons were held for approximately 30 minutes, banded, and sampled for mercury analysis of blood

and feathers. Repeated measures of loon blood mercury levels on specified lakes and within specific territories (for large lakes) is an effective measure of temporal trends in methylmercury availability. At least 16 lakes have had loons sampled for blood mercury levels. Previous sampling efforts were from 1993-1998. Because adult blood mercury levels represent recent dietary uptake of mercury from fish, adult loon blood reflects fish mercury levels from the past 1-2 months in the breeding lake. Blood samples are currently being analyzed for the concentration of total mercury. In addition a subset of blood samples will be analyzed for lead.



During the two-week study on 31 SNF lakes, 16 adult and 18 loon chicks were captured and processed. Contracted biologists are currently completing a final report that will provide information on the health and reproduction of loons, trend information on the level of mercury and lead content in

loons on the Forest, and how levels of lead and mercury in loons compare to birds in other areas of Minnesota, the upper Great Lakes and western Ontario, and in North America. A report is expected in April, 2006.

Participation in Minnesota Forest Resources Council Auditing Process for Implementation Forest Management Guidelines

During FY 05 a sample of timber harvest and related road management actions on the Forest were monitored as part of the Statewide auditing process used to assess implementation and success of Minnesota Forest Resources Council (MFRC) site-level forest management guidelines. Several of the MFRC guidelines are designed to mitigate the impacts of timber harvest and associated forest management practices on watershed-related resources such as riparian areas, wetlands, and soil productivity. Audits were conducted by a Minnesota DNR contractor during May 2005 on five separate sites with recently-completed timber harvest on lands administered by the Superior National Forest.

(2) Monitoring Activities

Monitoring Question

To what extent is Forest management affecting water quality, quantity, flow timing and the physical features of aquatic, riparian, or wetland ecosystems?

Monitoring Driver(s): Objective. O-WS-1. Improve and protect watershed conditions to provide water quality and quantity and the soil productivity necessary to support ecological functions and intended beneficial water uses **AND Objective O-WS-2(c)** Characterize the ecological composition, structure and function and patterns of individual lakes, streams, wetlands....and the watershed and landscapes in which they are nested.

Applicable Monitoring Activity, Practice, Or Effect Measured	Methods	When Monitored	Location or Project Area
<p>(1) Lakes- Water quality parameters</p> <p>(2) Streams – Stream channel, habitat, and substrate condition information collected at established stream cross sections and monitoring sties within established reference reaches. Fish and mussel population information also collected within each reference reach.</p>	<p>(1) BW Fuels EIS. Stream Morphology, Sediment, & Temperature. Other measurements include Wolman pebble counts, dissolved oxygen, total suspended solids, pH, alkalinity, and phosphorus.</p> <p>(2) Stream channel reference reaches and monitoring stations were established at 28 sites in 13 streams and rivers in 2005. Monitoring stations were established within representative stream reaches in mid-level project areas including Virginia, Whyte, and Devil Trout. Reference reaches were selected based on known or anticipated management activities in order to monitor long-term effects to stream channel conditions, water quality, and fish and/or mussel populations. Stream cross sections were established within each reference reach. Electrofishing and/or snorkel surveys also occurred within each reference reach.</p>	<p>June-September.</p> <p>(2) June - September</p>	<p>(1) BWCAW Sites locations.</p> <p>(2) Stream channel reference reaches were established within recent midlevel project areas including (Virginia, Whyte, and Devil Trout Project Areas).</p>

Monitoring Driver(s): Objective O-WS-2 (b). Restore ecological integrity on all or parts of one or two of the Forest’s fifth level watersheds per year by: Improving road and trail crossings of streams and wetlands to assure soil stability, unimpeded flow, sediment transport, and/or passage of fish.

Applicable Monitoring Activity, Practice, Or Effect Measured	Methods	When Monitored	Location or Project Area
Number of road/stream crossing improvement projects completed annually. Miles of stream habitat restored as a result of road/stream crossing improvements.	Account for all road/trail stream crossing improvement projects completed each year. Fisheries, aquatics, watershed, and engineering staff should cooperate to report accomplishments.	Annually, prior to completing annual M&E reports.	Individual sites where road/trail stream crossing improvements have occurred in any given year

Monitoring Driver(s): Objective O-WS-6. Reconstruct one-half to three miles of stream channel per year, based on principles of stream geomorphology, to enable the flow of water and sediment to occur without resulting in a change in stream pattern, dimension and profile.

Applicable Monitoring Activity, Practice, Or Effect Measured	Methods	When Monitored	Location or Project Area
<p>Keep track of the number of stream miles that are experiencing improved conditions resulting from stream crossing improvements, channel restoration, and/or in stream habitat improvements, riparian planting, and riparian habitat enhancement efforts.</p> <p>Assess conditions after stream improvement projects have been completed to assure that projects have achieved their stated objectives in terms of stream dimension, pattern and profile.</p>	<p>Account for total miles of stream restored that can be attributed to all or in part to purposeful stream rehabilitation/restoration efforts including road stream crossings, direct habitat improvement, riparian planting, and riparian habitat improvement.</p> <p>Stream Crossing Improvements - Following stream crossing improvement project, utilize the coarse level culvert survey protocol to evaluate overall success of the project.</p> <p>Channel Restoration/In stream Habitat Improvements - Monitoring surveys would include re-surveying established stream cross sections, longitudinal profiles, and established channel reference condition sites within each project area. Additional monitoring would include individual structure evaluations at all known structure sites. Structures would be evaluated by comparing previous site sketches and photos to current conditions.</p> <p>Riparian Planting and/or Habitat Improvement – Establishment of stake rows to monitor survival rate of riparian plantings.</p>	<p>Prior to completing annual M&E report</p> <p>Each site should be monitored at least once every 3-5 years. Monitoring may occur during the months of June through October.</p>	<p>Streams and/or stream reaches that have been improved/ restored as a result of road-stream crossing improvements, stream habitat improvement, riparian planting, or riparian habitat improvement efforts.</p> <p>Stream crossing and stream channel habitat restoration project monitoring will begin in 2006. All projects completed since 2000 will be initially monitored in 2006.</p>

Monitoring Driver(s): Desired Condition. D-AQ-1. Air on the forest is of high quality so that: 1) ecosystems are not impaired by pollutants originating in the air, AND **Desired Condition. D-AQ-3.** Air emissions from National Forest management actions do not degrade natural resources or uses of the Forest.

Applicable Monitoring Activity, Practice, Or Effect Measured	Methods	When Monitored	Location or Project Area
<p>b) monitor precipitation chemistry (NADP)</p> <p>c) monitor mercury in fish and other select animals</p> <p>d) monitor long-term water chemistry for selected lakes</p>	<p>(b) Analyze precipitation samples for a variety of chemical constituents.</p> <p>(c) Capture & analyze fish for the presence of mercury in their body tissues. Loons were also captured, measured, and blood samples taken to be tested for mercury and other toxics.</p> <p>d) analyze lake water from sampled lakes for a variety of chemical constituents</p>	<p>b) 2005</p> <p>c) 2005</p> <p>d) 2005</p>	<p>b) Fernberg environmental monitoring site near Ely, MN</p> <p>c) Fish were collected from more than 12 SNF lakes; loons were sampled from more than 16 SNF lakes</p> <p>d) Ten SNF lakes</p>

Monitoring Question

To what extent are Forest Plan Standards & Guidelines being met, specifically FP standard S-WS-4 and guide G-FW-1?

Monitoring Driver(s): 36 CFR 219.12 (k) [2]. Documentation of the measured prescriptions and effects, including significant changes in productivity of the land.

Applicable Monitoring Activity, Practice, Or Effect Measured	Methods	When Monitored	Location or Project Area
<p>Degree to which Standards and Guidelines representative of Water Quality Best Management Practices (BMPs) are being applied to Forest projects.</p>	<p>Sampling, largely via on-site visual observation by a monitoring crew, of recently-harvested timber harvest sites to evaluate whether site- and project-appropriate BMPs have been applied to reduce or minimize the impact of non-point source water pollution.</p>	<p>May 04; three sites.</p> <p>May 05; five sites.</p>	<p>For 2004, three such units were monitored on lands administered by the Superior NF; for 2005, five such units were monitored.</p>

(3) Evaluation and Conclusions.

Desired Conditions/Objectives

Monitoring Driver(s): Objective. O-WS-1. Improve and protect watershed conditions to provide water quality and quantity and the soil productivity necessary to support ecological functions and intended beneficial water uses **AND Objective O-WS-2(c)** Characterize the ecological composition, structure and function and patterns of individual lakes, streams, wetlands.....and the watershed and landscapes in which they are nested

2005 Accomplishment Established long-term monitoring stations at 28 sites on 14 streams on the Superior National Forest. Long-term monitoring stations included reference reaches, stream cross sections, habitat surveys, fish assessments, and mussel surveys, when possible. Future monitoring efforts will provide information to evaluate progress towards meeting established Forest Plan Objectives O-WS-1 and O-WS-8. Established 10 long-term lake monitoring stations to track trends in lake chemistry across the Forest.

2005 Accomplishment Contribution Towards Desired Conditions & Objectives

A. FOREST PLAN DIRECTION/FEIS CONDITION				
Record of Decision(7/04)	(DECADE 1)		2005 Accomplishments &/or Condition	
Existing Condition	FP DC, Objective, or S&G's	FEIS Projected or Proposed Condition	Actual Accomplishments implemented	Actual Accomplishments & Approved NEPA
LAKES & STREAMS Few established lake and stream monitoring stations. - Baseline information may be available that includes historic water quality monitoring records for individual water bodies.		LAKES & STREAMS Long Term Lake and Stream Water Quality Monitoring - (D-WS-5) - Water quality, altered stream flow, and channel stability do not limit aquatic biota or associated recreational uses. Water in lakes, streams, and wetlands meets or exceeds State water quality requirements.	28 sites on 14 streams 15 lakes (10 multiple sampling locations).	BWCAW Fuels EIS Water Quality Monitoring (10 Lakes)

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
Established 28 stream reference reaches & 15 lake monitoring sites.	N-A BWCAW Fuels EIS - 10 Lakes (75% Achievement)	Increasing trend toward monitoring lake & stream water quality conditions.	N-A BWCAW Fuels EIS – Increasing trend toward accomplishment (10 of 15 lakes monitored)

Monitoring Driver(s): Objective O-WS-2 (b). Restore ecological integrity on all or parts of one or two of the Forest's fifth level watersheds per year by: Improving road and trail crossings of streams and wetlands to assure soil stability, unimpeded flow, sediment transport, and/or passage of fish.

2005 Accomplishment The Superior National Forest planned, designed, and implemented road/stream crossing improvement projects at three locations on Forest Service Roads 532 and 112 in 2005. Two miles of stream habitat were improved by replacing inadequate culverts with new structures that promoted stream flow, sediment transport, and fish passage in the Dark River and Sturgeon River watersheds. In addition, coarse level stream crossing surveys occurred in the Whyte, Devil Trout, and Mid Temperance Mid-level project areas in 2005. Coarse level data will be utilized to identify priority crossings for stream crossing improvements in future years. Stream crossings were also evaluated and analyzed for the Dunka Project based on the proposed action and alternatives.

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
Large backlog of crossings in need of improvement.	Complete 1-2 road/stream crossing projects each year. This will in result in 10-20 projects completed by the end of the 1 st Decade.		Road/stream crossing improvement projects; 3 Improved/restored stream miles; 2	Three of five road/stream crossing improvement projects identified in the Virginia EIS were completed in 2005. Two (2) miles of stream habitat were improved.

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
15%-30%	Three road/stream crossing improvement projects were completed in 2005 (15-30%).	At or exceeding FP Direction	Accomplishments indicate positive trend toward meeting Forest Plan objective.

Monitoring Driver(s): Objective O-WS-6. Reconstruct one-half to three miles of stream channel per year, based on principles of stream geomorphology, to enable the flow of water and sediment to occur without resulting in a change in stream pattern, dimension and profile.

2005 Accomplishment The Dark River Stream Habitat Improvement Project contributed to improving/restoring 1 mile of stream habitat in 2005.

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
Many opportunities for stream habitat improvement projects.	5 TO 30 Miles of improved stream habitat by end of 1 st decade		Restored or improved stream habitat 1 mile	Restored or improved 1 mile of stream habitat (Dark River Habitat Improvement Project Categorical Exclusion)

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
Restored or improved 1 mile of stream habitat (3-20% Achievement)	Restored or improved 1 mile of stream habitat in the Dark River (3-20 % Achievement)	At or exceeding FP Direction	Accomplishment indicate positive trend in achieving Forest Plan objective (Dark River Habitat Improvement Project CE).

Monitoring Driver(s): Desired Condition. D-AQ-1. Air on the forest is of high quality so that: 1) ecosystems are not impaired by pollutants originating in the air, AND **Desired Condition. D-AQ-3.** Air emissions from National Forest management actions do not degrade natural resources or uses of the Forest.

2005 Accomplishment In 2004 and 2005 the forest monitored the chemistry of over a dozen lakes to assess changes that could affect the aquatic ecosystem. The Joint Fire Sciences Program (JFSP) partially funded this study to determine if BWCAW prescribed burning is affecting lake chemistry and thereby also mercury in fish. Besides the JFSP study, five additional lakes were sampled as part of a program to track long-term trends in lake chemistry across the forest.

The SNF and MN DNR jointly captured and analyzed fish from over a dozen lakes as a part of the overall state fish contaminant monitoring program. Analysis by MPCA of trend data from lakes that have been repeatedly been sampled over multiple years revealed that fish mercury content in Forest lakes decreased in approximately half of the lakes, increased in about ¼ of the lakes, and remained relatively constant in about ¼ of the lakes. These ratios are approximately the same as the trends observed in the overall statewide dataset.

Loons were captured, measured, and blood samples taken to be tested for mercury and other toxics. A report on the work will be issued early in 2006 describing any adverse affects the loons may be experiencing due to the contamination of their diet.

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 Dc, Objective, or S&G's	FEIS Projected or Proposed Condition	Actual Accomplishments implemented	Actual Accomplishments & Approved NEPA
b) <u>precipitation chemistry</u> has been reasonably well documented c) many waters are on the Impaired Waters list and subject to fish consumption advice due to high levels of <u>mercury in fish</u> d) long-term trends in <u>water chemistry for SNF lakes</u> is largely unknown	Air on the forest is of high quality so that: 1) ecosystems are not impaired by pollutants originating in the air, AND Air emissions from National Forest management actions do not degrade natural resources or uses of the Forest (D-AQ-1 and D-AQ-3)		(b) one complete year's record of precipitation chemistry as measured by NADP and NADP-Hg protocols (c) Mercury in Fish: >12 lakes sampled for mercury in fish Loons; mercury & other toxics sampled in loons on > 16 lakes d) Water chemistry sampled on about 10 lakes	NA

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
NA	NA	b) flat c) about 50% of sampled lakes decreased' 25% increased 25% stayed same (d) Unknown	NA

Monitoring Driver(s): 36 CFR 219.12 (k) [2]. Documentation of the measured prescriptions and effects, including significant changes in productivity of the land.

2005 Accomplishment . Results of MFRC implementation auditing of FY 04 & FY 05 timber sales demonstrate very good use of appropriate BMPs. During 2005 five sites were monitored. Highlights of FY 05 findings are: **(a)** Exposed soil over more than 5% of area, erosion, and rutting deeper than 6" in filter strips did not occur on any site **(b)** Wetland skid trail crossings impacts did not occur at 3 of 5 sites; at 2 sites a skid trail crossed a wetland during unfrozen conditions, resulting in some rutting but no erosion **(c)** **At 4 of 5 sites** post operation skid trail re-vegetation exceeded 50%, not rutted deeper than 6", & not eroding.; at 1 site a small amount of skid trail erosion was observed in one wetland **(d)** water diversions on roads or skid trails were not needed or applied at 4 of 5 sites; **(e)** no evidence of petroleum-based spillage at 4 of 5 sites, one small oil spot observed at 1 site, no logging trash was observed at any of the 5 sites.**(f)** 4 of 5 landing sites were exclusively upland; one landing was partially located in a wetland & a filter strip **(g)** no erosion or repeated rutting deeper than 6" was observed at any of the landings or over the harvest sites in general..

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
Compliance with MFRC site level guidelines, with exceptions where provided for by specific Forest Plan direction	Compliance with MFRC site level guidelines, with exceptions where provided for by specific Forest Plan direction		Highlights of the audit findings are presented in the paragraph immediately above.	NA

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
NA	NA	Continuation of high level of compliance as documented in audit results from previous years.	

Standards and Guides

Standard & Guide Descriptor	Standard & Guide Description	Compliance	Remarks
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 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.	Yes	Good
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 to SNF
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, whichever 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 understory vegetation.	Yes	Too early to tell
S-WS-1	Management actions on NFS land will not increase the total (all ownerships) acreage of	Yes	Good

Standard & Guide Descriptor	Standard & Guide Description	Compliance	Remarks
	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.		
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 and 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 help rehabilitate disturbed areas.	Yes	Good
G-WS-1	Restore eroded sites, generally 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	Warrants more focused monitoring
S-WS-12	Natural wetlands will not be used for sewage disposal for administrative purposes, unless done for research to develop operational guidelines or after such guidelines are established.	Yes	Good. No such proposals were made
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 for habitat restoration.	Yes	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-WS-1	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.
O-WS-2 (c)	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.
O-WS-6	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.
O-WS-2(a), 3.4 & 5	See Management Recommendation below for riparian vegetation management
D-AQ-1 & 3	(1) Annually, continue to add to the mercury-in-fish and precipitation chemistry databases to detect/assess trends. (2) Continue to monitor at intervals of no more than five years to detect trends in mercury levels in loons—next sample collection should be in the year 2010 or sooner.
O-WS-2(b)	Initiate monitoring program to evaluate road/stream/wetland 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 2006-2007. Expand the systematic process used to assess road and trail crossings to address wetland crossings that does not involve streams. Include “stream” crossings in the identification of priority locations for crossing improvement projects
O-TS-4 & 5	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.
O-WS-8	Update the upland young/upland open analysis for the entire Forest every three years. <u>Supporting rationale.</u> Existing information is 10-12 years old and should be revised to assist with required NEPA watershed/fish and aquatics analyses. This process should be initiated in 2006 or 2007. Forest Hydrology, Fisheries and GIS staff should cooperate to accomplish this task.
Proactive Riparian Management Objectives, S&G's	Ensure that vegetation management NEPA decisions include proactive riparian management, particularly in the near-bank zones. <u>Supporting rationale.</u> To fully implement the intent of the Forest Plan and ROD, the Forest must move away from mitigative management and toward proactive riparian management.
Multiple WS standards and guideline	Design a systematic monitoring protocol to evaluate implementation of the Watershed standards & guidelines. <u>Supporting rationale.</u> Highest priority for better tracking should be on WS direction that varies from the MFRC site level guidelines. Forest Hydrology, Fisheries, Soils, & Timber Administration should cooperative to develop these.

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

The SNF Fisheries and Aquatics Program will coordinate with other agencies, governments, and universities to inventory and monitor management indicator species, non-native invasive species, and riparian habitat conditions. Efforts will be made to coordinate future monitoring activities, share monitoring data, and potentially collaborate to fund future monitoring efforts. Superior

Collaborator/Partner	Monitoring Activity	Accomplishment
USDA-FS North Central Research Station	Potential fire effects on mercury cycling in watersheds	Collaborated with Forest in 2 nd Year of this 3 year study
Minnesota Pollution Control Agency	Precipitation Chemistry, Trends in Lake & Stream Chemistry	Collaborated in funding Mercury-in-precipitation analysis at the Fernberg Monitoring Station.
US Environmental Protection Agency	Precipitation Chemistry (NADP)	Funded operation of NADP at Fernberg and associated lab analysis of precipitation chemistry
Minnesota Department of Natural Resources	Mercury in fish. Lake and Stream fish population monitoring. Watershed and stream habitat improvements. Oversight of MFRC site level guideline audit program.	Collaboration in collection and testing of fish from more than 12 Forest lakes. Cooperator in Dark River Habitat Improvement Project. Contractor collection of MFRC guideline implementation data on 5 timber sales
Fon Du Lac Band of Lake Superior Chippewa	Dark River Habitat Restoration Project. Lake and stream fish Population surveys.	Cooperated with water quality monitoring associated with the Dark River Habitat Restoration Project. Conducted lake and stream fish assessments on the Superior National Forest.
1854 Authority	2005 Loon/Mercury Project	Provided assistance with loon capture and tissue collection.
Bio-Diversity Research Institute	Mercury in Loons	Collection & testing of loons from more that 16 Forest lakes.
Trout Unlimited, Potlatch Corp., Laurentian Env Learning Center, Minnesota Cons Corps	Assisted with Dark River Habitat Restoration Project.	Provided in-kind volunteers &/or youth to assist with the Dark River Restoration Project. Assisted with project monitoring, riparian planting/improvements, & trail improvements.
MN Forest Resources Council	Oversight of MFRC site level guideline audit program	Contractor collection of MFRC guideline data on 5 timber sales
Voyageurs National Park	Lake Chemistry and Biology	Future collaborators on lake monitoring
Regional Office Staff	Lake Chemistry and Biology	Future collaborators on lake monitoring