



United States
Department of
Agriculture

**Forest
Service**

Superior
National
Forest



Superior National Forest

FY 2007 Monitoring and Evaluation Report Executive Summary

July 2008



Executive Summary
Fiscal Year 2007
Superior National Forest Monitoring & Evaluation Report

The 2007 Monitoring and Evaluation Report (M&E Report) is the third compiled under the 2004 Superior National Forest Land and Resource Management Plan (Forest Plan) that was approved on July 30, 2004. The M&E Report summarizes the results of monitoring Forest Plan implementation (including the Boundary Waters Canoe Area Wilderness) from October 2006 through September 30, 2007. The National Forest Management Act planning regulations (36 CFR 219) specify that, "at intervals established in the Forest Plan, implementation shall be evaluated on a sample basis to determine how well objectives have been met and how closely management standards and guidelines have been applied. Based on this evaluation, the interdisciplinary team shall recommend to the Forest Supervisor such changes in management direction, revisions, or amendments to the Forest Plan as are deemed necessary."

The report is prepared by an Interdisciplinary Forest Service team that incorporates information gathered from Forest Service specialists, partners, other agencies, private citizens, and non-profit organizations. The M&E report is intended to be comprehensive, displaying monitoring conducted, evaluation management considerations and summary points.

The M&E process enables the Forest Service to assess its effectiveness in moving toward stated management goals, desired conditions and management objectives. Implementation of the Forest Plan through FY 2007 represents roughly 1/3 of the ten year planning period. Trends and degree of forest plan attainment are shown for most resources even though the trends generally are not yet clearly defined. If evaluations and conclusions warrant, the 2004 Forest Plan may be amended or revised to adapt to new information and changed conditions. The report did not document any significant adverse changes to the Forest resources during FY 2007 and at this point changes in the Forest Plan are not expected.

Highlights from the Report

In 2007, the Superior National Forest (SNF) staff monitored and evaluated management activities encompassing 25 resource areas. Highlights or key achievements by resource area of these monitoring efforts are as follows:

Cooperation

Each year the SNF continues relationships with existing cooperators and enters into new ones. Collaboration with others has resulted in increased public service and improved land stewardship, enhancing the Forest's efforts to achieve desired conditions and management objectives. The highlights portray groups and organizations with whom the SNF routinely cooperates, along with those whom the SNF has entered into formal agreements, including work contributed by volunteers. In 2007 the total value of the work provided by Partners through grants and agreements, special use permits and other non-agreement based funds, and through the work of volunteers to the SNF equals over **\$1,621,527**.

Air Quality

During 2007, air pollution was monitored from two sources: (1) sources outside the SNF and their effects on forest ecosystems, human health, and/or human enjoyment of forest resources; and (2) sources from within Superior National Forest and their effects on human health.

Overall, air quality monitored at Fernberg, one of a national network of air quality monitoring stations, in 2006 and 2007 showed no major change from that seen over the past five years. Air pollution from sources outside the Forest is not degrading forest ecosystems, human health or enjoyment of forest resources except for the following areas: visibility and mercury deposition.

In 2007 within the Superior National Forest a major short-term source of air pollution was the Ham Lake wildfire (Figure 1). Smoke monitoring data showed some days with values potentially over the Environmental Pollution Agency health standards. Since smoke from prescribed fire can generally be managed to avoid impacting sensitive areas, impacts such as those documented from the Ham Lake wildfire show the importance of completing prescribed fire projects so that large wildfires and their smoke impacts can be prevented.



Figure1. Satellite Photo on May 10 Showing Smoke from the Ham Lake Fire

Watershed-Riparian

During 2007, stream reaches, stream crossings, restoration projects, lake water chemistry, and mercury accumulation in fish, and wildlife species were monitored.

Physical habitat conditions and fish populations at established stream monitoring sites have changed very little since 2005. Since then, the Forest has successfully designed and completed seventeen projects which have improved aquatic systems.

When combined with projects completed in 2005 and 2006, the SNF has improved 13.5 miles of stream habitat. If this trend continues, the Forest should easily achieve its projected Decade 1 habitat improvement objective of 5-30 miles.

Insects and Disease

A significant increase in spruce budworm population continues to be observed with much of the infestation occurring within the Boundary Waters Canoe Area Wilderness (BWCAW). This insect defoliated approximately 135,000 acres during 2007, which is an increase of approximately 20,000 acres defoliated above that in 2006.

Treatment of gypsy moth populations with the pheromone *Disparlure* continues to be the most effective tool in managing the insect while minimizing environmental impacts. An additional 7,328 acres is proposed for treatment in 2008.

Fire

The spring of 2007 was an active period for wildfires on the east side of the SNF. The largest of these, the Ham Lake fire, ignited May 5, 2007 on the Superior National Forest and burned a total of approximately 75,000 acres (in and outside of the BWCAW). This included areas within the 1999 windstorm blow-down, areas already treated with prescribed fire for fuel hazard reduction, untreated areas, and developed wildland urban interface along the Gunflint Trail. Within the BWCAW, parts or all of seven prescribed burn units (7800 acres) re-burned during the May, 2007 Ham Lake Wildfire.

Monitoring did validate that mitigations outlined in the 2001 BWCAW Fuel Treatment project and Burn Plans were successful in protecting the soil organic layer, eagle nests, shoreline old forest, and interior old forest from impacts by prescribed fire.

The amount of fire in blow-down demonstrates the continued high fire risk posed by these fuels seven years following the 1999 windstorm. This risk is further increased by spruce budworm infestations in regrowth of spruce and fir.

Timber

During FY 2007 the SNF awarded 56,372 thousand board feet (MBF) on 5,533 acres within twenty timber sales. Actual volume harvested for this period was 27,930 MBF and actual area harvested was 1,649 acres. FY 2007 had the highest volume under contract and the second highest amount sold since the Forest Plan was approved in 2004. However, volume harvest was the lowest in 2007 because of a continued major downturn in the timber market. Five sales representing 6,766 MBF received no bids. To date, 162,200 MBF or 16% of the Decade 1 volume projection has been achieved. From 2005 through 2007, 9,928 acres have been harvested.

Actual treatments, when combined with planned approved treatments, would result in approximately 261 MBF harvested. This represents approximately 25% of the Decade 1 harvest volume projection.

In 2007 approximately 58% of vegetative treatments were clear cut compared to 60% clear cut during 2006 and 88% clear cut during 2005. The Forest Plan projects approximately 63% at the end of Decade 1.

Neither treatments within actual harvest units nor harvest treatments combined with adjacent existing young stands created young patches that approach 1000 or even 300 acres. However, when approved 2005 to 2007 decisions are implemented, 16 patches greater than 300 acres will be created for a total of 7,703 acres.

Non Native Invasive Species (NNIS)

Approximately 2,046 acres of terrestrial NNIS Plant Species occur on the SNF. In 2007 the first occurrence of garlic mustard, a highly invasive annual of forest under stories, was found.

Approximately 81 acres of terrestrial NNIS were treated, up from 8 acres treated during 2005. Treatments were 65% effective on average at controlling sites. There is room for improvement in this number. Monitoring showed that design criteria for minimizing weed spread were successful.

To date spiny water flea has been observed in 5 of 17 lakes surveyed and Rusty crayfish has been found in twenty lakes in the BWCAW. New and existing spiny water flea populations on the SNF suggest that this species current rate of invasion is increasing.

Vegetation

Forest Vegetation Composition, Structure, and Age

2007 results indicate that vegetation conditions on a Forest-wide scale are generally moving towards the desired Forest Plan objectives. Possible exceptions include the following:

- Within the Mesic Red and White Pine LE, the proportion of northern hardwoods forest type may exceed Decade 1, 2 and long term (100 yr) objectives.



Figure 2. Ham Lake Fire

- Within the Jack Pine/Black Spruce LE, the proportion of white pine forest type has the potential to exceed Decade 1, 2 and long term (100 yr) objectives.
- Within the Mesic Birch/Aspen/Spruce-Fir LE, the young age class (0-9) shows a trend downward from the Management Direction for the first decade (10%). Opportunities may exist in harvesting within the 50-79 age class to “create” the desired young age class conditions.
- Within the Lowland Conifer Landscape (LLC), the young age classes (0-9) in all categories show a trend away from meeting the Decade 1 Management Direction. In LLC-A and LLC-B, opportunities may exist to harvest in the 40-79 age classes so as to “create” desired young age class conditions

Vegetation Spatial Distribution

Within the Red/White Pine Mature and Older Forest, acres and number of patches continue to surpass Plan direction for both 100+ and 300+ acre patch sizes.

Within the Upland Mature and Older Forest (Zones 1 through 3), definitive trends are difficult to determine as most values remain essentially steady and continue to exceed Plan direction. An exception is the number of 1000+ acre patches in Zone 1 which remains three patches below the desired Forest Plan number of eight.

In Zone 3, while acreages of all patch sizes continue to exceed the existing condition as documented in 2004, the actual numbers of patches (with the exception of those 10,000+ acres) show declines. The reason for this is undetermined.

The above conclusions must be considered very tentative. It is premature to meaningfully discuss long term accomplishments or trends for several reasons. These reasons include:

- With a very limited number of vegetation management decisions since Forest Plan approval in 2004, only a small portion of the Forest has had project level implementation.
- The “pool” of young forest is continually changing as newly created areas are added, while at the same time, previously young forest is lost due to succession
- Project level activities do not necessarily uniformly occur across all LE’s. For this reason, opportunities to manage vegetation may be relatively absent in the early life of the Forest Plan while abundant in the latter years of implementation.

Wildlife. Management Indicator Species and Habitat

Aquatic MIS

The SNF monitored lake and stream habitat and success of habitat improvement projects. Summary Conclusions revealed from this monitoring were:

- Brook trout abundance within one habitat improvement project (Dark River Large Woody Debris Project) has increased from that observed in 2005.
- Walleye populations sampled in two lakes (Cascade and White Pine) appear to be relatively stable.
- Relatively strong 2006 (age-1) and 2007 (age-0) year classes were documented in several lakes on the Forest.



Figure 3. Stream electro-fishing with MN DNR

Terrestrial Management Indicator Species (MIS)

The Forest Plan designates four species as management indicator species (MIS):

- Gray wolf
- Bald eagle
- Northern goshawk
- White pine

Gray Wolf and Bald Eagle

Wolf

Based on the latest State wide monitoring in 2003/2004, the Minnesota Department of Natural Resources (MN DNR) concludes that there has been no significant change in the distribution or abundance of wolves in Minnesota since 1997. The current wolf population estimate of 3020 far exceeds the recovery plan goal of 1250-1400 wolves in Minnesota. In a long-term study within the SNF wolf density and population also remain high, indicating that the SNF is continuing to meet its objective to contribute to State wide population goals and wolf recovery.

In large part due to this increasing population the Fish and Wildlife Service removed the Western Great Lakes Distinct Population Segment (MN, WI, MI) of wolves from its list of endangered and threatened wildlife in March 2007.

Eagle

On the SNF the number of active nests increased in 2007 to 90 from 78 in 2000, bringing the SNF back in line with Forest Plan population objectives of a minimum of 85 occupied breeding territories. With the support of the results of these and other population information in the lower 48 states, the Fish Wildlife Service removed the bald eagle from its list of endangered and threatened wildlife in August 2007.

Of 30 projects implementing the Forest Plan since 2004, none have had an adverse effect on the eagle. In fact, many of these projects, especially the eight large landscape scale vegetation management projects, had beneficial impacts on eagle habitat where they restored white pine in areas close to lakes and streams, providing future habitat.

However, wildfires since 2004, particularly the Cavity Fire in 2006 and the Ham Lake Fire in 2007 may have affected potential nest trees such as old growth white pines which were known to have burned. Loss of old pines is of concern, so management actions are taken when possible to protect existing old growth pines.

Both Species

Wolf and bald eagle management since beginning of Forest Plan implementation has been fully consistent with Forest Plan objectives, standards and guidelines, both inside and outside of the BWCAW. This is true whether wolves or eagles are considered in their former status as a threatened species or their current status as a sensitive species and a management indicator species. This is because:

- All projects with decisions have been determined to be unlikely to adversely affect the wolf or eagle (as a threatened species) or to have negative impacts that could lead to trend toward federal listing (as a sensitive species).
- As a management indicator species population goals continue to be met or exceeded.
- All vegetation projects are continuing to maintain or improve habitat for wolves and eagles.
- Road density of high standard roads has not increased and remains well below the 1mi/sq mi threshold standard on a Forest-wide basis (wolf).
- Population and habitat trends will continue to be monitored for wolves and eagles.

Northern Goshawk

During 2007 32 occupied goshawk territories were found out of 68 territories surveyed and, of these, 23 territories had nest attempts. 75% of the nests were successful: productivity was 1.0 young/nest or 1.3 young/successful nest (MN DNR 2007). Within the SNF boundary, over 24 nests have been identified since 2000, compared to 12 known nests in 2003-2004. This increase is likely a result of a greater effort in monitoring goshawk populations, nesting activities, and habitat conditions in northern Minnesota.



Figure 4. Goshawk.

Monitoring has been valuable in helping better understand goshawk presence, distribution, habitat use, and management impacts.

The condition of mature upland forest habitat for northern goshawk remains well above the threshold for maintaining habitat suitability Forest-wide. While this single indicator of northern goshawk habitat does not address spatial configuration or stand complexity, it does show that as coarse filter habitat, conditions remain sufficient for maintaining goshawks.

White Pine

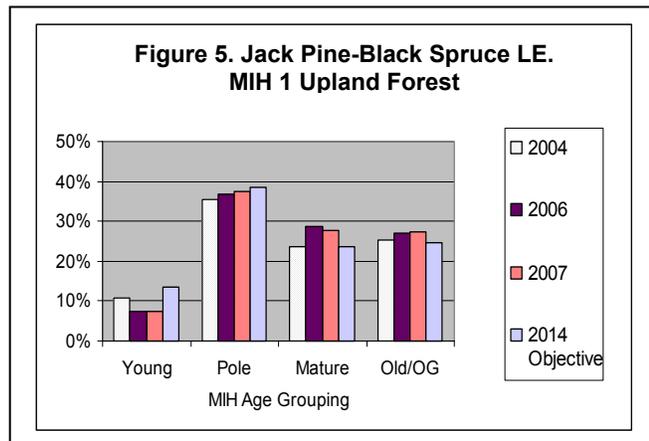
Since the Forest Plan was revised approximately 1,700,000 white pine seedlings have been planted on 3,060 acres within the SNF outside the BWCAW. White pines were also planted on 570 acres of other forest types to restore diversity of tree species to conditions more representative of native plant communities. Survival surveys since 2005 indicate an average third year white pine survival of 70%.

During 2007 white pine objectives were met in the Jack/Pine Black Spruce, Dry-Mesic Red and White Pine and Mesic Birch/Aspen/Spruce-Fir Landscape Ecosystems. This increase has come both from planting to convert stands to white pine and from succession of some old aspen stands to white pine.

Terrestrial Management Indicator Habitat (MIH)

MIH conditions change slowly. This is because in any given year Forest Plan implementation outside the BWCAW changes only a very small percent of the total habitat in each of the six Landscape Ecosystems. Because there is minor change from 2006, the more detailed analysis of MIHs in the 2006 report remains appropriate to this year.

Figure 5 shows the conditions of MIH 1 – Upland Forest within the Jack Pine-Black Spruce Landscape Ecosystem. MIH 1 is a habitat that encompasses all upland MIHs and upland forest types. As a “catch-all” upland MIH, it provides a very broad indication of habitat conditions based on age groupings. For associated species it represents the coarsest filter habitat for upland.



The conditions represented in Figure 5 show four different age groupings of MIH 1: Young seedling open forest stage; sapling/pole stage; mature forest; and old/old growth (OG) and multiaged stage.

The condition of the MIH at the beginning of Plan implementation – and those conditions analyzed in the 2004 Forest Plan Final Environmental Impact Statement – is represented by “2004”. Conditions in “2006” and “2007” are actual conditions on the ground. “2014 Objective” is the

percent that was projected in 2014 (end of first decade of the Plan) if the Forest Plan were fully implemented.

Wildlife Region Forester Sensitive Species (RFSS)

Aquatic

The SNF completed several population inventory, monitoring, and habitat improvement projects in 2007. These included the Namakan lake sturgeon habitat improvement project, RFSS mussel surveys, stream crossing surveys and improvements, and Dark River habitat improvement projects. These projects directly or indirectly benefited aquatic RFSS, including creek heelsplitter and black sandshell mussels, northern brook lamprey, and lake sturgeon.

Plants

In 2007 Forest Plan direction for maintaining, protecting, or improving habitat sensitive plants has been met. For a number of sensitive plants there was a notable increase in the number of known occurrences. This is primarily related to the amount of search effort that has been expended in the last few years.

Although sensitive plant habitat improvement projects typically do not affect much acreage, monitoring shows they are contributing to Forest Plan viability goals and objectives for sensitive plants.

Terrestrial

In 2006 and 2007 updates of the RFSS list resulted in changes to the list from 2004. Black tern and Wilson's phalarope were removed because they only very rarely occur, mainly as migrants and their open wetland habitat is not generally 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 as RFSS when they were removed from the endangered species list by the Fish and Wildlife Service. Adding them to the RFSS list ensures that SNF will continue to provide special management emphasis to

The SNF continually monitors habitat conditions, populations, locations, and/or reproductive success of most sensitive terrestrial animals.

Between 2004 and 2007 Forest Plan direction for terrestrial RFSS has been met. Plan implementation projects are enhancing or restoring habitat for the future for many of the species. Where projects decrease habitat, sufficient amount of well-distributed habitat is maintained so that any negative impacts are minimized and there is no loss of species viability or trend toward federal listing.

Wildlife. Threatened and Endangered Species (T&E)

Canada Lynx

Since Canada lynx was listed as a threatened species in 2000, the SNF has been involved in studying the ecology of lynx in northeastern Minnesota and monitoring lynx and its habitat.

Since 2003, researchers have captured and collared 33 lynx on the SNF. These have provided over 15,000 locations of collared animals that document reproduction, distribution, movements, habitat use, and located dens. Lynx have maintained a continuous presence from 2003 to date. Based on an assumption that 25% of Cook, Lake, and St. Louis might be suitable lynx habitat, researchers estimate possible lynx numbers of 190 to 250.



Figure 6. Club spur orchid a sensitive species inventoried in midlevel project area.



Figure 7. Canada Lynx

During Forest Plan revision the Forest Service and Fish and Wildlife Service agreed upon indicators of habitat conditions that would address lynx risk factors. These indicators are monitored annually and reflect vegetative management project effects on habitat conditions. Since 2004 eight large landscape scale vegetation management projects maintained, protected, or improved indicator habitat conditions for lynx. All projects were either 1) not likely to adversely affect lynx, or 2) were expected to have no effect. All projects were in compliance with relevant Forest Plan management direction.

Bald Eagle and Gray Wolf

2007 was an extraordinary year for threatened species on the SNF. Successful management efforts on the SNF, together with similar efforts by partners across other States, have helped contribute to the successful recovery of both the bald eagle and gray wolf. After more than 30 years for the wolf and 40 years for the eagle, both were removed from the Fish Wildlife Service’s list of endangered and threatened wildlife established under the Endangered Species Act of 1973. See MIS eagle and wolf sections above for information on population and habitat trends and management impacts.

Minerals

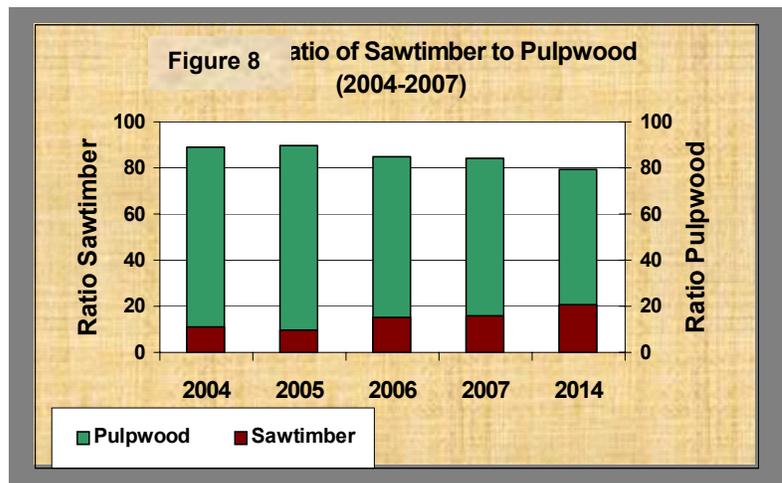
One prospecting permit application was received (1,295 acres) and 23 prospecting permits are pending approval from previous years (27,569 acres). In addition 3 federal hard rock mineral operating plans were analyzed under an EA and approved.

Monitoring site visits during active exploration projects have shown that companies are implementing their project in accordance with their operating plans. No notices of non-compliance were issued.

Social and Economic Stability

Total expenditures (funding) for Fiscal Year 2007 were about \$24,957,000 which represents a 16% decrease from the 2006 budget of \$29,685,000. Much of this difference can be attributed to a \$5,225,000 decrease in facilities funding. If facilities are discounted from the 2006 budget, funding for FY’s 2004, 2006, and 2007 is similar. Figure 1 displays expenditures since FY 2004.

During 2007 the ratio of sold sawtimber to pulpwood was 16:84. This ratio and prior year ratios are lower than the projected 21:79 ratio for Decade 1 in the Forest Plan Environmental Impact Statement but are trending upwards towards the 2014 projected condition.



Tribal Rights and Interests

The SNF has worked to increase the amount of government-to-government interactions with Tribal entities in 2007. Ongoing collaboration efforts for the SNF and the Bands of the Ojibwe have occurred through: government-to-government consultation; discussions based on National Historic Preservation Act Sec 106 and 110, Pre-National Environmental Policy Act (NEPA)and NEPA related discussions; collaborative agreements; project implementation; and regularly scheduled multi-topic meetings. The SNF has and continues to consult, engage, and cooperate with the Tribes at the project and program level during 2007.

Heritage Program

The Forest Plan and the 5 year heritage work plan direct the SNF to identify, evaluate, protect, monitor and interpret heritage resources on the SNF. Approximately 21,000 acres were inventoried for heritage resources resulting in the documentation 34 new sites.

83 previously inventoried heritage sites, 12 eligible sites previously open to public interpretation, and 10 burial sites were monitored.

Burned Area Emergency Response related and heritage program monitoring of heritage sites affected by the Cavity Lake Fire (2006) and the Ham Lake fire (2007) produced insights on the presence of heritage sites in unexpected locations.

Recreation Motor Vehicles (RMVs)

To facilitate implementation of the Travel Management Rule, the SNF worked in collaboration with the State of Minnesota, Cook, Lake and St. Louis Counties, and Tribal governments and the 1854 Authority to identify current and potential opportunities for motorized recreation including providing Off-Highway Vehicle (OHV) routes. In 2007, the Minnesota DNR issued decisions identifying OHV routes for State Forest lands in Cook and Lake Counties.

Four project decisions were made that designated 5.3 miles open and 64 miles closed to RMV travel. Since 2004, 42 miles have been designated open and 145 miles designated closed through project decisions.

During the fall of 2007 RMV use within selected areas near the BWCAW were monitored. These surveys were follow-up actions to more extensive RMV monitoring conducted in 2006.

Unauthorized RMV use and impacts were immediately brought forward to District Rangers and Law Enforcement personnel. Law Enforcement followed up on user created trail use, particularly within the BWCAW and filed incident reports.

Transportation

During Fiscal Year 2007, ten miles of *National Forest System* road were decommissioned - or, stabilized and returned to a more natural state. In addition, approximately 62 miles of roads approved for decommissioning but not yet implemented were identified in four 2007 decision documents. When these 2007 road projects in conjunction with 2005 and 2006 NEPA decisions are fully implemented, a total of 125 miles of roads will have been decommissioned.



Figure 11. 2007. Nira Project. Rock placement at road entrance to prevent motorized travel



Figure 12. 2007. Nira Project. Rock placement and loosened soil along road to prevent motorized travel

Wilderness

Three Wilderness activity categories were monitored during 2007. These included: (1) social conditions and land stewardship; (2) campsite conditions; and (3) the 10 Year Wilderness Stewardship Challenge.

Social conditions and land stewardship were evaluated by monitoring public contacts and visitor use. SNF staff made nearly 3000 field contacts in the BWCAW, issued over 11,000 permits, showed BWCAW user education video to over 40,000 people, and made 49 Leave No Trace presentations to local groups. In 2007 6,527 permits were granted out of 8,646 lottery applications. The total number of reservations between May 1 and September 30 were 35,481, which is on a par with the number of permits in 2005 and 2006.



Figure 13. Wilderness Crew

Campsite conditions were improved on 2,402 sites through routine maintenance, latrine replacement, erosion control projects, hazardous tree removal, tree planting and other projects. Additionally, 123 miles of portage trails were maintained or improved.

The Ten Year Wilderness Challenge, a national Forest Service initiative that pledges to bring all 406 Forests Service wildernesses up to a minimum level of stewardship by 2014. With extra funding and newly created or enacted management plans, the SNF is at 61% of the wilderness stewardship level - a substantial contribution to improvement from nationwide average in 2003 of 18% . The SNF intends to go beyond 61% after 2008 by improving management of non-native invasive plants, protection of opportunities for solitude, conducting recreation site inventory in highest priority areas, and improving databases.

The effects of non wilderness management activities on wilderness character were documented in 2006 and 2007 project decisions and through Forest wide monitoring.

Lands

Lands Program activities monitored and evaluated included land purchase, land exchanges, pilot conveyance, third party partnerships, and appraisal of the BWCAW. Program highlights were:

- Two properties totaling 47.70 acres valued at \$676,000 were purchased.
- No land exchanges were completed.
- Through the Conveyance program, properties totaling 5.02 acres of land with structures were sold for \$385,517.
- As part of Thye-Blatnick Act to appraise Federal lands within the BWCAW, an appraisal contract was issued and the BWCAW is currently being appraised. New values are to be determined by October 1, 2008.
- The Trust for Public Land secured three parcels totaling 132 acres.