



United States
Department of
Agriculture

Forest
Service

November 2012



Chequamegon-Nicolet National Forest

Fiscal Year 2011 Monitoring and Evaluation Report



For More Information Contact:

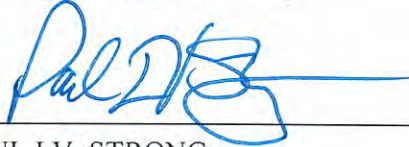
Matthew St. Pierre, Biologist
Chequamegon-Nicolet National Forest
500 Hanson Lake Road
Rhinelander, WI 54501
715-362-1300

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

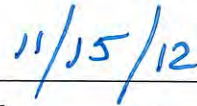
APPROVAL AND DECLARATION OF INTENT

I have reviewed the Monitoring and Evaluation Report for Fiscal Year 2011 for the Chequamegon-Nicolet National Forests that was prepared by an interdisciplinary team during FY 2012. I am satisfied with its findings and intend to consider recommendations made therein as the Land and Resource Management Plan is maintained. The Report meets the intent of the 2004 Land and Resource Management Plan.

This report is approved by:



PAUL I.V. STRONG
Forest Supervisor



Date

Contents

Approval and Declaration of Intent.....	3
Introduction	5
Forest Plan Overview	5
CHAPTER 1 Required Monitoring	7
Lands are adequately restocked.....	7
Control of destructive insects and disease.....	7
Population trends of the seven management indicator species in relation to habitat changes.....	10
Comparison of Projected and Actual Outputs and Services	27
Comparison of Actual and Estimated Costs.....	31
CHAPTER 2 Goal and Objective Monitoring	33
Threatened, Endangered and Sensitive Species	33
Objective 1.1a: Under the Endangered Species Act (ESA), implement established recovery or conservation strategies.....	33
Objective 1.1b: Improve habitat conditions for Regional Forester Sensitive Species (RFSS)	36
Aquatic Ecosystems.....	41
Objective 1.3a: Reduce the number of road and trail stream crossings. Reduce sedimentation and improve fish passage in existing road and trail stream crossings.	41
Objective 1.3e: Improve or restore habitat in streams and lakes.	43
Objective 1.4g: Annually treat non-roadside and roadside NNIS sites.	45
Soil Resources.....	47
Objective 1.7: Provide desired physical, chemical and biological soil processes and functions on the Forest to maintain and/or improve soil productivity.	47
Recreation Opportunities	48
Objective 2.1d and 2.1e: Construct up to 85 miles of ATV trail on the Nicolet landbase and up to 100 miles of ATV trail on the Chequamegon landbase.	48
Objective 2.1i: Provide well-maintained developed campgrounds that meet USFS guidelines.....	49
Cultural Resources	50
Objective 2.4c: Conduct scientific studies to further our understanding of human adaptation and influences on the landscape.....	50
Minerals and Energy Resources	51
Objective 2.6: Ensure that reclamation provision and environmental protections measures of operating plans and surface use plans of operations are completed to standard.....	51
Fire Management.....	51
Objective 2.8c: Reduce hazardous fuels within communities at risk, in cooperation with local, Federal, and State agencies.	51
CHAPTER 3 National Visitor Use Monitoring.....	52
CHAPTER 4 Conclusions	55
Highlights.....	55
Recommendations.....	55
References.....	57

INTRODUCTION

Forest Plan Overview

The Chequamegon-Nicolet National Forest (hereafter “Forest”) covers more than a million and a half acres in northern Wisconsin. The Forest is in the midst of restoration following the broad scale timber harvesting that denuded the area from the mid-1800s to the early 1900s. The Forest is comprised of land within 11 counties (Ashland, Bayfield, Florence, Forest, Langlade, Oconto, Oneida, Price, Sawyer, Taylor and Vilas) and provides a variety of recreation opportunities (e.g., camping, hunting, and wildlife viewing), ecosystem services (e.g., clean air and water), and forest products (e.g., pulpwood and sawtimber) that contribute to the local and regional economies.

Management on the Chequamegon and Nicolet National Forest is guided by a Land and Resource Management Plan, also called “forest plan” which was approved in 2004. The 2004 forest plan supports continued restoration of the terrestrial and aquatic ecosystems of the Chequamegon-Nicolet National Forests using the best science available while enabling Forest Service staff to provide a wide array of sustainable goods and services.

The forest plan:

- ♦ establishes Forestwide multiple-use goals and implementing objectives, and Forestwide management requirements (known as Forestwide standards and guidelines),
- ♦ outlines management area desired future conditions and management direction, including standards and guidelines that are management area-specific,
- ♦ identifies lands suitable for timber management,
- ♦ constructs monitoring and evaluation requirements, and
- ♦ recommends areas for wilderness designation to Congress.

The forest plan provides guidance for all resource management activities on the Chequamegon-Nicolet National Forest.

National Forest Management Act (NFMA) regulations require monitoring and evaluation to take place on a regular basis to determine the efficacy of a forest plan. Specifically, the regulations direct monitoring and evaluation strategies must be designed to determine (1) how well the direction in the forest plan is being implemented, (2) whether the application of standards and guidelines is achieving objectives and whether objectives are achieving goals, and (3) whether the assumptions and predicted effects used to formulate the goals and objectives are valid. Through this strategy, the forest plan may be amended or revised to adapt to new information and changed conditions.

A key requirement of a monitoring strategy is that the public be given timely, accurate information about forest plan implementation. Releasing an annual monitoring and evaluation report accomplishes this requirement. The monitoring program must be

efficient, practical, and affordable, and may make use of data that has been or will be collected for other purposes.

Monitoring tasks are performed at different levels: the forest plan, program, or project level. Each of these levels involves different objectives and requirements. Monitoring is not performed on every activity and is not expected to meet the statistical rigor of formal research.

In this document we report the results of monitoring and evaluation during Fiscal Year 2011. Not all of the monitoring and evaluation activities outlined in the monitoring plan of the Forest Plan (Chapter 4) are reported here because the reporting frequency varies among the items; some items are not due to be reported upon this year. In addition, some items are scheduled to be reported upon this year but due to the reduced capacity on the CNNF, monitoring and evaluation activities were not accomplished. When budget levels limit the CNNF's ability to perform all of the monitoring tasks scheduled, monitoring events specifically required by law are given the highest priority. Some monitoring items lack measurement indicators which limits their usefulness in evaluating progress toward desired resource outcomes.

This report is the first monitoring and evaluation report since the FY 2009-2010 and Mid-term Monitoring and Evaluation report released in October 2011. That report is much more comprehensive; it addresses all monitoring items outlined in the 2004 Forest Plan's monitoring program (Chapter 4). Please refer to that report for the most recent monitoring and evaluation information for items not reported in this document.

CHAPTER 1

REQUIRED MONITORING

The National Forest Management Act established monitoring and evaluation requirements for all national forests. In addition, the forest plan prescribes the frequency in which monitoring tasks must be completed (forest plan table 4-1, p. 4-6). The monitoring tasks scheduled to be reported upon in fiscal year 2011 are reported in this chapter.

Lands are adequately restocked.

The CNNF aims to maintain the land productively growing trees, whether they are planted or regenerated naturally. In fiscal year 2011 we assessed and certified that trees were adequately restocked on 6,491 acres (Table 1). The success of restocking efforts is determined by monitoring how well forest stands are regenerating during the 3rd and 5th years after planting or natural regeneration. All of the treated lands in fiscal years 2009, 2010 and 2011 were certified as being on schedule and there was no need for follow-up reforestation work. The majority (62 percent) of the reforested acres were naturally regenerated with some level of site preparation (e.g. burning, roller-chopping, scarification). For stands that failed to meet stocking criteria ("lands not restocked"), fill-in planting often occurs to ensure adequate reforestation.

Table 1. Results of restocking surveys in acres (3rd and 5th year surveys).

Lands certified restocked	2006	2007	2008	2009	2010	2011
Natural regeneration with site preparation	3,664	3,054	1,721	2,848	3,673	3,987
Natural regeneration without site preparation	1,147	1,096	1,375	1,073	1,509	1,546
Planted	1,038	644	41	541	885	958
Seeded	15	0	0	0	0	0
Lands not restocked						
3rd year	125	49	51	0	0	0
5th year	28	93	188	0	0	0
Total	153	142	239	0	0	0

Control of destructive insects and disease.

Federal regulations exist to prevent destructive insects and disease organisms from increasing to potentially damaging levels following management activities. Prevention includes early detection followed by control or treatment, if needed.

Detection

Aerial pest detection flights by the State and Private Forestry branch of the Forest Service occurred on all ranger districts within the Chequamegon-Nicolet National Forest in July of

2011. Overall, it was a very quiet year for insect and disease activity, with no sign of hardwood defoliators anywhere on the Forest. Aerial detection revealed the following:

Washburn district: The most significant damage on the Forest in 2011 was wind damage south and east of Drummond affecting a few hundred acres of the CNNF in the vicinity of Lake Owen. (This early July storm blew down over 100,000 acres of state, private, and county forests to the southwest of the CNNF.) Also, moderate to heavy defoliation by jack pine budworm was noted at the north end of the district.

Great Divide district: No significant damage was noted.

Medford-Park Falls district: No significant damage was noted.

Eagle River-Florence district: The aerial observer noted some spruce budworm defoliation north of Highway 70, and some scattered blowdown near Morgan and Wheeler Lakes.

Lakewood-Laona district: A small pocket of blowdown was noticed about two miles northeast of the town of Mountain.

Treatment

Oak Wilt – Oak wilt was first discovered on the Forest in 1997 on the Lakewood-Laona Ranger District. Monitoring and treatment of infected sites began in 2001, and has occurred every year from 2004 to 2010 (Figure 1). Annual treatment of infected areas on the Lakewood-Laona Ranger District has occurred since 2001. In 2011 on the Lakewood Ranger District, 1,482 oaks were removed from 24 sites to limit the risk of further oak wilt infection. Oak wilt treatment involves harvesting the trees in the fall and winter and removing the bark or splitting the wood into small enough pieces to encourage rapid drying (i.e., split firewood) prior to April 1. In addition, the stump is completely uprooted to sever all root connections, eliminating the risk of root graft spread of oak wilt.

The efficacy of using the vibratory plow to slice through large root systems varies due to uneven topography and rocky conditions common within the forests. Use of an excavator to “pop” stumps of infected trees from the ground and overturn them following harvest was effective on 63 percent of the sites with just one treatment. On 94 percent of the sites, the disease has been successfully controlled with either one or two treatments; that is, the follow-up treatment when needed has been effective nearly all of the time. Monitoring of known sites, reconnaissance to detect new sites and treatment continues in the Lakewood-Laona Ranger District. Oak wilt has not been detected on any other districts of the Forest although the disease was discovered in the Eagle River area in 2010.

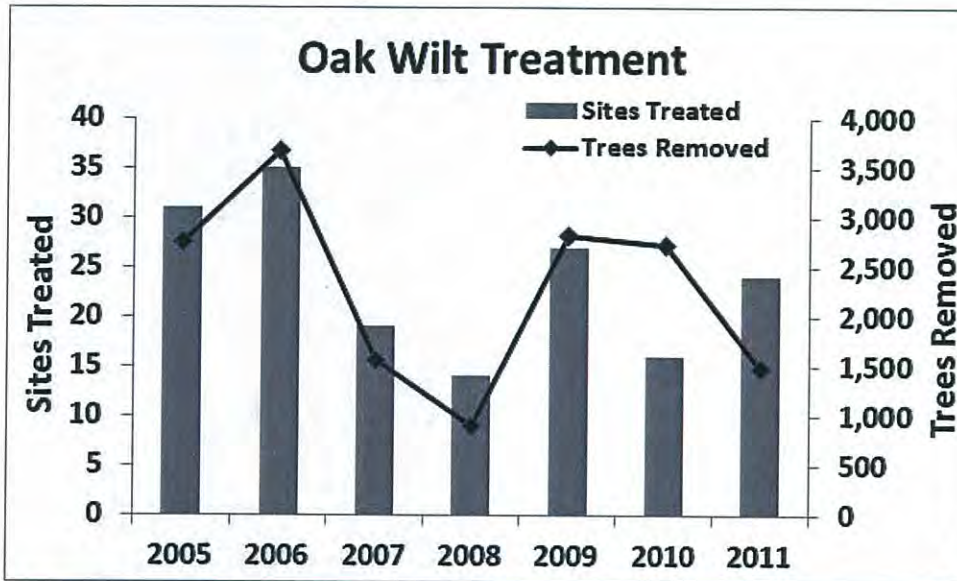


Figure 1. Oak Wilt treatment on the Lakewood-Laona Ranger District

Gypsy Moth – Pheromone flakes reduce the spread of gypsy moth by 50 to 70 percent when compared to no treatment. Pheromone flakes confuse the male moth during the breeding period and reduces its ability to find a mate. Reducing breeding success slows population expansion and spread of the gypsy moth, which allows time for natural diseases and viruses to limit its populations. Smaller amounts of acres were treated with *Bacillus thuringiensis kurstaki* (BtK) which is a naturally occurring soil bacteria that is toxic to moth and butterfly caterpillars when they ingest it.

The Forest participates annually in the national program “Gypsy Moth: Slow the Spread.” Approximately 8,330 acres were treated with pheromone flakes in 2009, and in 2010, approximately 7,663 acres were treated in five locations within Bayfield County in the Washburn Ranger District (Table 2). In 2011, approximately 8,312 acres in one block was treated with pheromone flakes in Sawyer County on the Great Divide Ranger District.

Table 2. Gypsy moth Slow the Spread Program (aerial application of pheromone flakes and BtK) on the Chequamegon-Nicolet National Forest

Year	Acres Treated	Notes
2005	2,151	1,314 acres treated with pheromone flakes: 837 acres treated with BtK
2006	4,420	all pheromone flakes
2007	675	all pheromone flakes
2008	38,622	38,598 acres treated with pheromone flakes: 24 acres treated with BtK
2009	8,330	all pheromone flakes
2010	7,663	all pheromone flakes
2011	8,312	all pheromone flakes
Total	70,173	

Spruce Decline – Spruce decline is the name given to a condition that rapidly kills trees – particularly upland white spruce – and it has affected thousands of acres on the Chequamegon-Nicolet National Forest. The exact cause of spruce decline is not known, though it is probably the combination of several factors including extended droughts, spruce budworm infestation, fungal spruce needle cast infection, and *Armillaria* root disease (Photo 1).

The spruce decline event has slowed considerably since its peak in 2004-2007, and has essentially run its course. In 2011, 89 acres were salvaged at four sites, all on the Great Divide district (Table 3). All stands being monitored under the 2004 Spruce Decline and the 2006 Spruce Decline II decisions have now either (1) met the trigger point and been included in a salvage sale, or (2) been determined to not be a salvage situation due to the spruce being only a minor stand component. A couple of stands included in salvage sales have not yet been harvested.



Photo 1. White spruce dying of a general stand decline

Population trends of the seven management indicator species in relation to habitat changes.

Management indicators are “plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they might represent” (FSM 2620.5, WO amendment 2600-91-5).

The forest plan includes eleven¹¹ management indicators; seven species and four communities. Of the seven species, five (gray wolf, bald eagle, American marten, northern goshawk, and red shouldered hawk) are either Regional Forester-designated sensitive species or federally listed threatened or endangered species. Goals and objectives have been developed in the forest plan for maintenance and improvement of these species’ habitats. The remaining two indicator species, brook trout and Canada yew, do not necessarily have goals and objectives, but the forest plan does provide direction for the improvement of habitat.

Table 3. Spruce decline salvage treatments on the Chequamegon-Nicolet National Forest (2005-2011)

Year	Acres Salvaged
2004	52
2005	101
2006	461
2007	1,932
2008	1,126
2009	459
2010	24
2011	89
Total	4,244

Management Indicator Species (MIS)

Gray Wolf (*Canis lupis*)

The Gray wolf has been on and off the Federal threatened and endangered species list since 2007. It was delisted by the U.S. Fish and Wildlife Service in 2007, relisted in 2008, delisted and relisted in 2009. The Chequamegon-Nicolet National Forest maintains a conservation approach, per Forest Plan direction, while the U.S. Fish and Wildlife Service continues to address delisting of the Western Great Lakes distinct population segment.

In 2011, wolves exceeded the Eastern Timber Wolf Recovery Plan's goal of 3 packs/30 animals (USDI-FWS 1992) across the Chequamegon-Nicolet National Forest. Most recent estimates show the Wisconsin wolf population ranging from 782-824 individuals (Wydeven et al. 2011) with approximately 30 to 50 percent of this population residing on the Forest (Figures 2 and 3). The Federal recovery plan for the gray wolf called for the Chequamegon-Nicolet National Forest to harbor six packs or 60 wolves across the Forest. Currently the Forest sustains over 50 packs with 150-250 animals total at any given time on National Forest lands. Consequently, this species has made sufficient recovery across the Western Great Lakes and it is currently being proposed for Federal delisting by the U.S. Fish and Wildlife Service (2011).



Photo 2. Gray wolf (photo: Dave Mech, courtesy of Nature Serve)

In regards to habitat conservation, gray wolf population density is dependent more on interactions with prey, other wolves, and humans than on the abundance of any particular forest habitat. The Forest sustains large acres of forest habitat that contain abundant prey and limited human interactions. Wolves currently occupy 80 percent or more of the suitable wolf habitat on the Chequamegon portion of the Forest and approximately 40 percent of the Nicolet portion, where human encounters are more likely due to an increased mixed-ownership pattern. Habitat is not limiting for this species.

Known wolf den sites are protected per Forest Plan direction (p. 2-19) and open road densities of roads with higher traffic levels (maintenance levels 3-5 and some level 2 roads) remain low on the Chequamegon-Nicolet National Forest. These actions provide adequate conservation in accordance with the Federal Wolf Recovery Plan (USDI Fish and Wildlife Service 1992) and the Wisconsin Department of Natural Resources management plan (WDNR 1999).

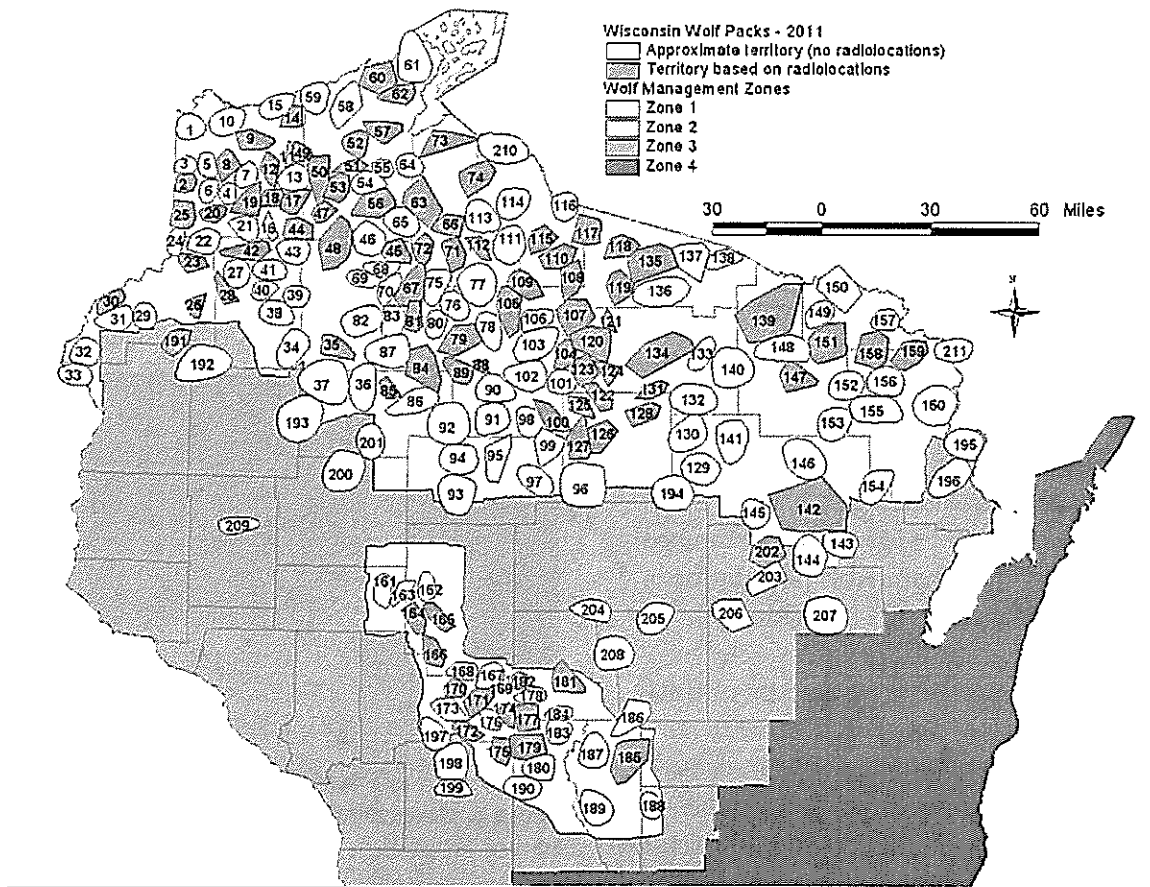


Figure 2. Wolf packs in Wisconsin 2011 (source: Wydeven et al. 2011)

The forest plan directs that all known wolf den sites be protected (p. 2-19) and open road densities of roads with higher traffic levels (maintenance levels 3-5 and some level 2 roads) remain low. These actions were followed to provide adequate conservation, and were completed in accordance with the Federal Wolf Recovery Plan (USDI Fish and Wildlife Service 1992) and the Wisconsin Department of Natural Resources management plan (WDNR 1999).

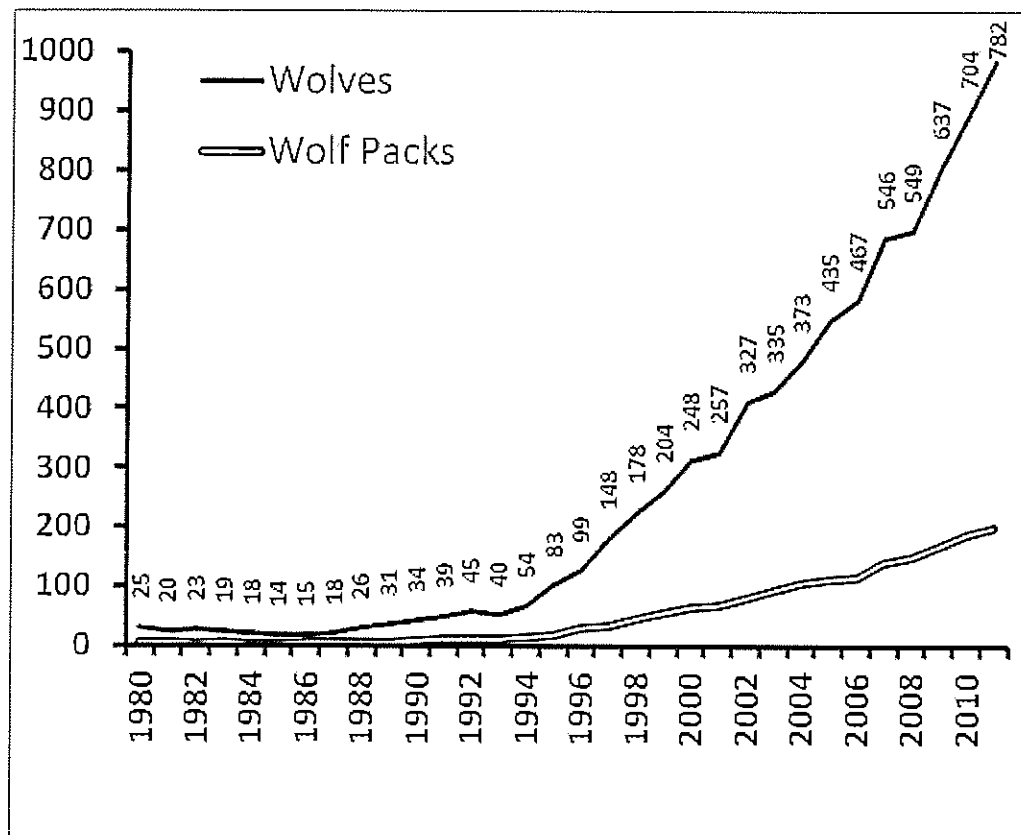


Figure 3. Changes in Wisconsin gray wolf population 1980-2011 (source: Wydeven et al. 2011)

Bald Eagle (*Haliaeetus leucocephalus*)

The Forest has been an active participant in the bald eagle Federal and State recovery plans since the species was placed on the Endangered Species Act list in 1973 (USDI Fish and Wildlife Service 1983, WDNR 1986). In 1991, 414 active territories were estimated throughout the state, which was above the recovery plan's goal of 360 set by the U.S. Fish and Wildlife Service (figure 4). Numbers have remained above this level since 1991. As a result, the bald eagle was removed from the Federal list of threatened and endangered species on August 9, 2007. In 2011, Wisconsin was home to 1,247 nesting pairs. This total represents roughly 13 percent of the 9,700 pairs estimated to be breeding in the lower 48 states (Eckstein et al. 2010).

The 1986 Chequamegon and Nicolet forest plans both had goals of 30 active nests by 2000. In 2006, 41 historic nesting territories were surveyed on the Chequamegon landbase, of which 32 were active and contained 43 young. The Nicolet landbase had 41 historic territories surveyed, of which 35 were active. Both Forest landbases have met or exceeded the recommended recovery goal annually since 1997. Current field information continues to suggest that this species is abundant, sustaining levels well above those described for the Forest in the Northern States Bald Eagle Recovery Plan (1983). The species continues colonizing new areas on the National Forest.

Bald eagles need suitable nest trees and aquatic foraging areas (lakes and rivers) as habitat. Although there is no reasonable means to evaluate the abundance of available nest trees near the roughly 600 lakes greater than 10 acres in size and riverine habitat on the Chequamegon-Nicolet National Forest, nest monitoring suggests that nest trees and fish resource are abundant enough to sustain a stable to increasing population. Although the bald eagle



Photo 3. Bald eagle

is no longer listed under the Federal Endangered Species Act, the forest plan directs and guides their conservation according to the restrictions set in the Northern States Bald Eagle Recovery Plan by limiting activity within 330 feet of a nesting tree. In addition, the forest plan imposes seasonal restrictions on roads and trails within 1,320 feet of a nest, and reserves known roosting, perching, and potential nest trees within active bald eagle breeding areas.

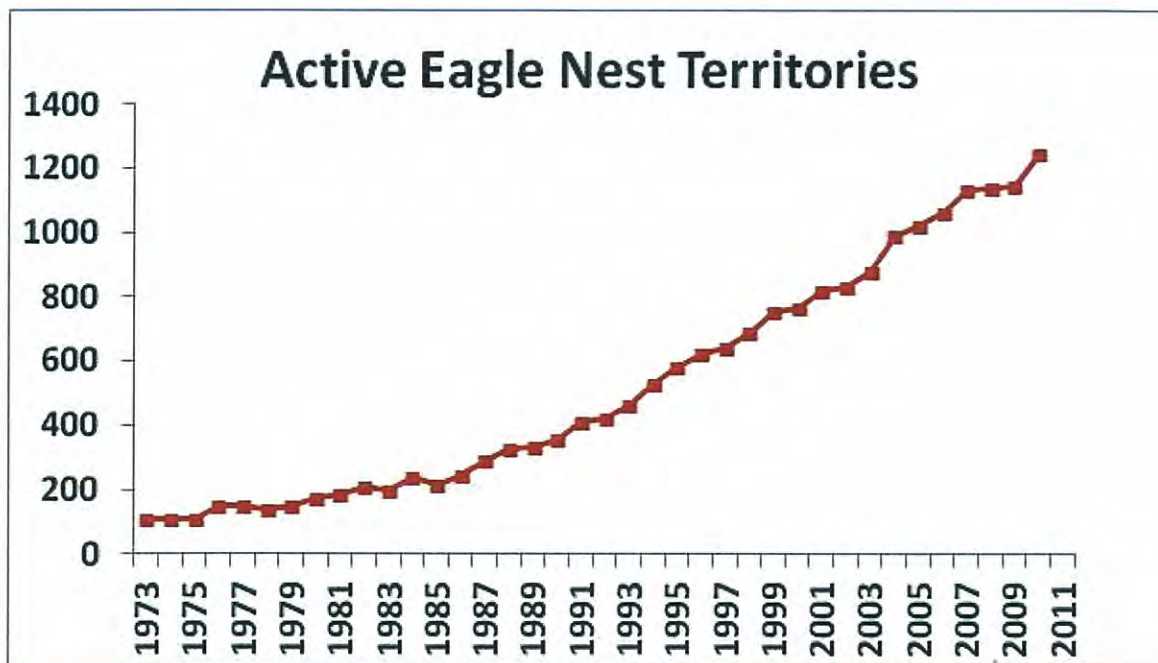


Figure 4. Active bald eagle nest territories in Wisconsin 1973-2011

Northern Goshawk (*Accipiter gentilis*)

The northern goshawk is a large, forest-dwelling raptor generally associated with mature deciduous, conifer, or mixed forest (Boal et al. 2001). The forest types of southern Ontario and the northern portions of Michigan, Minnesota, and Wisconsin are the southernmost extent of its current breeding range (Kennedy and Anderson 2006). Because the Chequamegon-Nicolet National Forest is at the southern part of its geographic range, there are lower densities of goshawks and greater variation in population dynamics when compared to populations from the center of its range (Kennedy and Anderson 2006 pp.11).



Photo 4. Northern goshawk

The Chequamegon-Nicolet National Forest has been monitoring northern goshawks on the Chequamegon-Nicolet National Forest since 1997 due to concerns that forest management may be having a negative effect on populations. Known territories have been monitored to evaluate occupancy and reproductive success. Forest biologists developed systematic surveys in 2008 to better detect this species. These surveys resulted in new territories being discovered and known territories found to be abandoned. Trends indicate a stable to slightly increasing number of territories during the monitoring period for this species on the Forest (see Tables 4 and 5). Results of the bioregional monitoring effort of northern goshawk in the Western Great Lakes, including sampling units on the CNNF, were published in 2011. Bruggeman et al. (2011) concluded that “goshawks are widely, but sparsely, distributed throughout the WGL bioregion.” In 2011, 21 known territories were checked on the Chequamegon landbase of the Forest; ten were active and 11 young were fledged from them. On the Nicolet landbase in 2011, 28 nests from the northern half of the Forest were monitored. Of those nine were found to be active but the number of young that fledged from them is unknown.

Table 4. Nesting data for northern goshawk on the Chequamegon landbase, 1988–2011

Year	1992	1994	1996	1998	2000	2002	2004	2005	2006	2007	2008	2009	2010	2011
Territories Checked	13	13	13	13	13	13	14	18	16	15	22	15	17	21
Active Territories	0	0	7	0	4	5	5	10	10	6	10	9	11	10
Active Nests	0	0	7	0	4	2	4	9	10	6	7	7	10	8
Successful Nests	0	0	4	0	1	2	2	6	5	2	5	6	8	6
No. Young	0	0	11	0	2	4	5	11	12	4	10+	13	14+	14
No. Fledged	0	0	11	0	2	4	5	10	12	4	10+	11	14+	11

During the development of the 2004 Forest Plan, northern goshawks were considered to be a mature northern hardwoods associated species. While it is true that this species uses mature northern hardwoods for nesting and foraging, it also uses other habitats; it is more flexible than assumed during Plan revision. Inspection of nest monitoring data shows that the majority of nests are within mature northern hardwoods habitats but this may be a result of its availability relative to other mature forest types. Protection of northern goshawk on the CNNF centers on minimizing disturbance and habitat alteration around active and historic nest sites (USDA-FS 2004a, p. 2-20).

Table 5. Nesting data for northern goshawk on the Nicolet landbase, 1998–2011

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Territories Checked	63	62	unk	72	74	65	65	57	63	63	51	51	47	28
Active Territories	16	17	unk	16	12	12	17	13	12	9	8	17	19	9
Active Nests	11	16	14	13	10	11	17	13	12	9	6	17	19	9
Successful Nests	9	12	9	9	3	9	13	8	9	9	6	16	11	3
Fledged Young	16	27	19	15	7	20	23	13	20	18	18	34	22	unk

Red-shouldered Hawk (*Buteo lineatus*)

The red-shouldered hawk is a medium to large woodland hawk that is widespread in eastern United States, southeastern Canada, California, and Mexico. In Wisconsin, the red-shouldered hawk was probably never common, but was most abundant in mature bottomland forests along major rivers such as the St. Croix, Wisconsin, Chippewa, and Wolf Rivers (Robbins 1991, p. 213). Timber harvest activity prior to 1930 greatly affected these habitats. As these forests have regenerated and aged, the red-shouldered hawk continues to be recorded in many counties across the state, although it is still considered an uncommon resident.

On the Chequamegon-Nicolet National Forest, active territories are found primarily on the southern portion of the Nicolet landbase where bottomland forest habitat is more prevalent. We expected territories to exist on the Chequamegon landbase, especially in the Medford Ranger District near the bottomland forest of the Headwater River, but extensive survey efforts for more than ten years across thousands of acres has not confirmed nesting there. The absence of the red-shouldered hawk on the Chequamegon landbase may be due to small channels, limited flows, and narrow floodplains, which are not well suited for red-shouldered hawk nesting within the bottomland forest.

Fewer active nest were found in 2011 (11) than 2010 (17) possibly because of the cold, snowy spring in 2011 compared to the warm, early spring in 2010. General productivity (0.91 young/active nest) was down only slightly from 2010 (0.94) but the success of the nests was up to 55% compared to 29% for 2010 (Figure 5, Jacobs 2011). Due to the cold spring, fewer active nest were found statewide in 2011 (31) than 2010 (41) and brood sizes were smaller in 2011 (2.39) than 2010 (3.15) for Wisconsin. Northern areas in

Wisconsin such as the Forest seem to be more affected by weather, like a cold spring, than areas farther south (Jacobs 2011).

The forest plan directs the conservation of this species with the same restrictions of human disturbance and timber management activities for nesting sites and habitat as those for the northern goshawk.

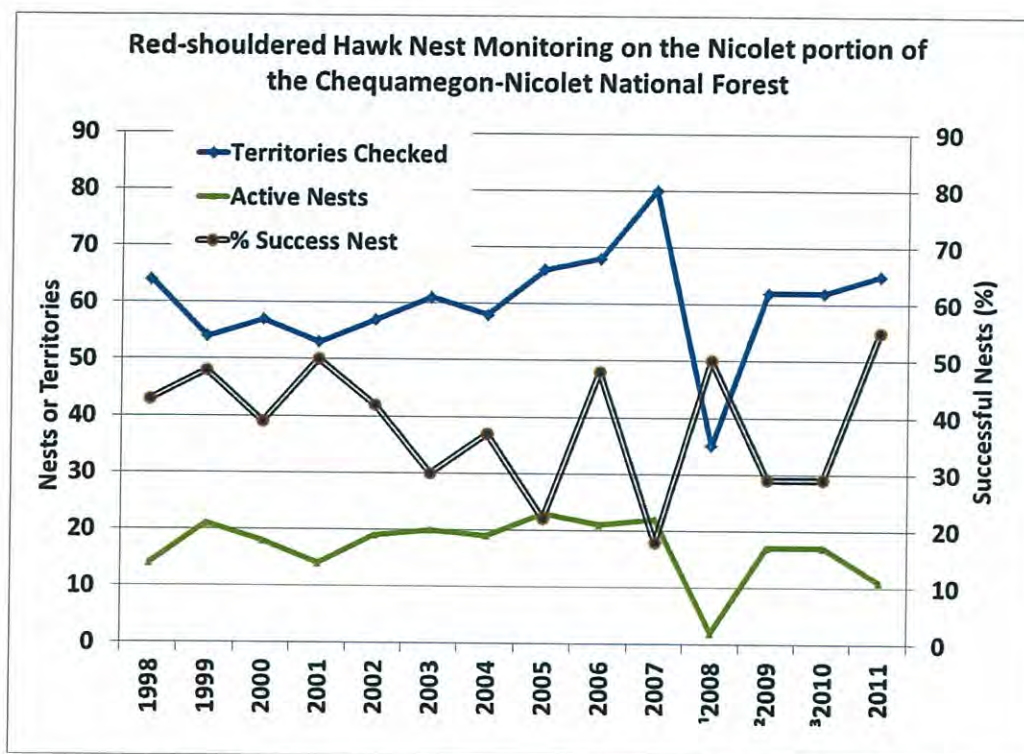


Figure 5. Red shouldered hawk nesting data for Nicolet portion of the Chequamegon-Nicolet National Forest, 1998 – 2011.

¹2008: only northern Nicolet landbase was searched for active nests

²2009: only southern Nicolet landbase was searched for active nests

³2010: only northern Nicolet landbase was searched for active nests

American Marten (*Martes americana*)

Status – The mature conifer forests that covered northern Wisconsin before the 1800s provided prime habitat for American marten, which lived throughout the northern part of Wisconsin. The marten is currently listed as endangered by the State of Wisconsin. Efforts at reestablishing American marten in Wisconsin began in 1953 and continued through 2011 with the release of animals captured in Minnesota. Recent reintroduction efforts have been a collaborative effort of the WDNR, GLIFWC, the Wisconsin Trappers Association and the CNNF. More females than males and more adults than juveniles have been translocated over the past few years in an attempt to improve productivity and recruitment. All translocated animals were marked with passive integrated transponder tags (PIT tags) so they could be identified and some of the animals are collared with radio transmitters to allow for monitoring of movement and survival. From the monitoring of the reintroduced animals, the research partners have determined that the home ranges for collared martens are 3 to 5 times larger than native

martens. Adult survival rates were higher than juveniles' (approximately 60 percent vs. 40 percent after 200 days following release).

The American marten status on the Chequamegon portion of the Forest is an example of a species constrained by issues beyond forest management. The amount and sex ratio of reintroduced martens, coupled with increases in competitors and predators limited the success of the initial reintroductions. Since then, habitat investigations indicated that habitat for this species appears sufficient on the Forest. Stocking success of the last several years continues to be monitored through the efforts of our partners. We have no current population estimate for marten on the Great Divide Ranger District.



Photo 5. American marten prior to release on the Great Divide Ranger District (photo: U.S. Forest Service)

The forest plan guides conservation of American marten habitat in areas that are occupied by marten by limiting the amount of timber harvest removal following large disturbances, and incorporating reserve tree guidelines relative to numbers and diameters in even- and uneven-aged managed stands (USDA-FS 2004a, p. 2-22).

Brook Trout

Status – The Chequamegon Nicolet National Forest contains over 1,000 miles of class I and class II trout streams, which are valuable aquatic and recreational resources. Maintaining or improving this resource requires consideration of water temperatures, in-stream habitat, effects of beaver, and historic and current management activities.

Maximum summer water temperatures less than 22 °C provide optimum temperatures for brook trout while those less than 26 °C provide tolerable temperatures for brook and brown trout, particularly where there is local groundwater inflow. Therefore, the presence of brook trout in a stream indicates that the system is predominately groundwater driven and has cold clear water throughout the year.

Monitoring and Population – Forest personnel, in collaboration with the Wisconsin Department of Natural Resources, have set up sampling stations, which vary in length from 100 to 2,000 feet, on streams across the Forest. They completed full population estimates at one set of stations and general presence/absence surveys at another set of stations.

Brook trout populations on two class I trout streams, Foulds and Elvoy Creeks have been monitored since 1980 and 1999, respectively, but were not sampled in 2011. We

have restored areas of in-stream habitat on both streams and each supports naturally reproducing brook trout populations. See the Forest's 2009 and 2010 Monitoring Reports for the most recent information on brook trout in those streams.

Forest Management – The forest plan guides the Forest to avoid adverse impacts to trout populations (USDA-FS 2004a, p. 2-16 to 2-17). Maintenance of aspen forest adjacent to class I, and II trout streams, and segments of class III trout streams is discouraged because aspen habitat is favored by beaver. In place of aspen, long-lived conifer and northern hardwoods are emphasized adjacent to trout streams. The Forest also manages beaver population levels and mitigates stream impacts of beaver activity to achieve free-flowing stream condition, which helps maintain cooler water temperatures and improve in-stream habitat.

Canada Yew (*Taxus canadensis*)

Status – Canada yew is a low growing, evergreen, coniferous shrub found in mixed-hardwood hemlock forests, white cedar swamps, and swamp edges in the northeastern United States and southeastern Canada. Yew is a slow-to-mature, shade-tolerant species that grows best in stable environmental conditions of climax mixed-conifer hardwood forests.



Photo 6. Canada yew on the slopes of the Penokee Range on the Great Divide Ranger District.

Table 6. Canada yew occurrences on the Chequamegon-Nicolet National Forest from 2004-2011.

Year	Discovered sites (new)		Total documented yew sites on CNNF (existing + new site)
	East Side (Nicolet)	West side (Chequamegon)	
2004	16	0	77
2005	9	0	86
2006	43	0	129
2007	69	16	214
2008	22	0	236
2009	29	0	265
2010	1	11	277
2011	0	1	278
Total	189	29	278

The CNNF designated Canada yew as a management indicator species in the Forest Plan because it was considered “a species of near viability concern primarily because of white-tailed deer browse” (USDA-FS 2004a, p. 2-55). CNNF inventory data shows that the majority of the Canada yew sites occur on the east side of the Forest with the number of sites increasing since 2004 and peaking in 2007 (Table 6).



Photo 7. Regenerating aspen stand

While this data indicates a noticeable lack of Canada yew on the Chequamegon landbase, these estimates do not reflect the substantial populations of yew found on the Great Divide Ranger District in and around the Penokee Range where the species occurs along the talus slopes of the Penokee Range and in the ecotones between upland and lowland northern white cedar. It is thought that these areas have a snow depth that protect these populations from browse and allows the yew to colonize the slopes. Monitoring the size and reproductive status of known populations of Canada yew remains an opportunity for furthering the evaluation of Canada yew as an indicator of deer browse pressure.

Management Indicator Communities

The forest plan emphasizes restoring natural disturbance patterns (like fire cycles), structural and compositional features, and other characteristics that are currently underrepresented on the Forest. Forest plan objectives provide direction for the restoration of three of the four management indicator communities (mature northern hardwood interior forest, pine barrens, and mature natural red pine and white pine forest). The fourth indicator habitat (regenerating aspen) is not rare on the Forest, but there is high public concern over the abundance of this forest type and the species associated with it.

Regenerating Aspen Forest

Aspen stands under 20 years of age are considered suitable habitat for a number of songbirds (such as golden-winged warbler, chestnut-sided warbler, indigo bunting), game birds (like American woodcock, and ruffed grouse) and animals (such as white-tailed deer). Young aspen stands, among all forested lands, are sought out by ruffed grouse hunters for a successful hunt. Ruffed grouse numbers, as indexed by drumming counts (Dhuey 2011) were near the peak of their population cycle in northern Wisconsin in 2011 (Figure 6).

Regenerating aspen forests, for the purpose of this discussion are stands that are less than 20 years old and consist of quaking or big tooth aspen stands, balsam poplar stands, or mixed stands of aspen, white spruce and balsam fir (Quinn and Schmidt

2007). The habitat type is created through even-aged management techniques such as clearcut, shelterwood, or overstory removal harvests. Aspen forest may also be created following large disturbance (e.g. blowdown) events. The amount of aspen harvested

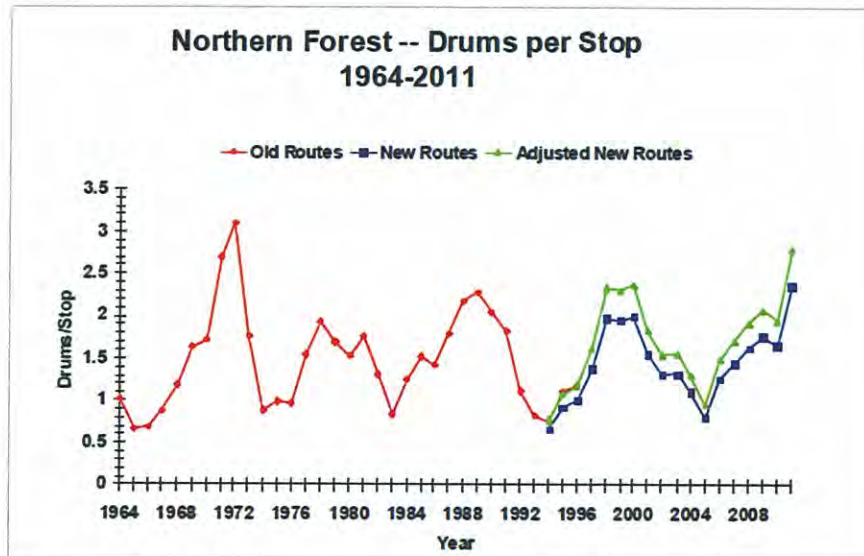


Figure 6. Ruffed grouse drumming counts in the northern portion of Wisconsin (source: Dhuey 2011).

in any one year, which contributes to the category of “regenerating aspen” acreage for the next 20 years is influenced by the overall amount of timber sold and then harvested by timber sale contractors, the mix of forest products offered by the Forest to meet other Forest Plan vegetation management objectives, and the desires of wood-using companies interested in hardwood and softwood trees.

During the development of the 2004 Forest Plan and still today, the amount of young aspen forest on the CNNF is an issue of high public concern because it is sought out by bird hunters in the fall and because it is an important habitat for the golden-winged warbler, a species of conservation concern.

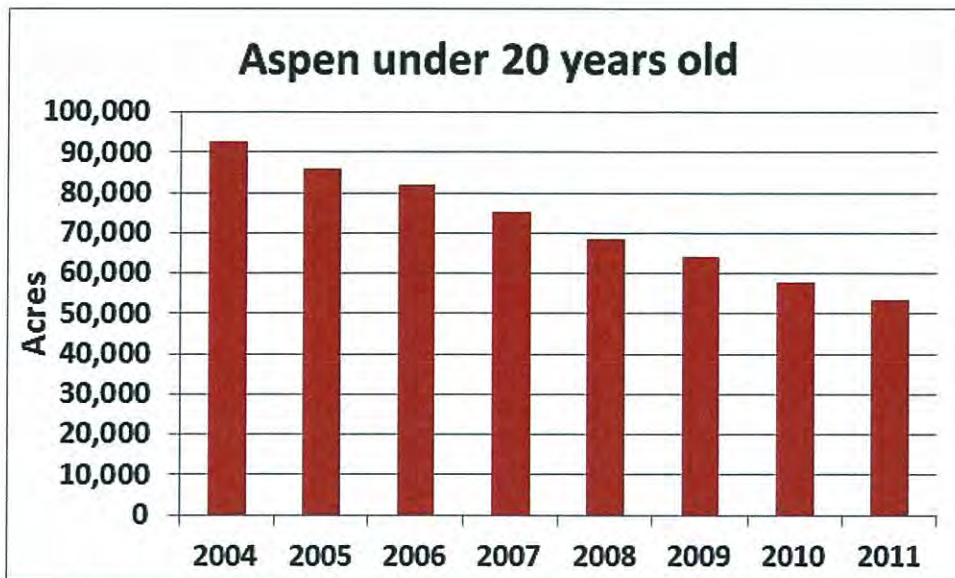


Figure 7. Acres of regenerating aspen on the Chequamegon-Nicolet National Forest from 2004-2011.

Approximately 337,300 acres of aspen existed on the CNNF in 2011; approximately 53,600 acres of that total (16 percent) met the description of regenerating aspen (younger than 20 years of age) on the Chequamegon-Nicolet National Forest. This total continues the downward trend in representation on the CNNF (Figure 7). Acreages of regenerating aspen peaked on the Forest during the 1990s at approximately 132,600 acres. Aspen forest, and regenerating aspen forest, in particular, has been decreasing statewide since at least 1996 according to USFS Forest Inventory and Analysis surveys covering lands of all ownership categories (Perry et al. 2008, Perry 2012).

The Forest Plan anticipated a gradual decline in aspen forest, including regenerating stands, on the CNNF because many aspen stands were to be converted to other forest types adjacent to trout streams and as a result of the increased emphasis on longer-lived tree species. By 2014, approximately 330,000 acres of aspen were expected to exist on the CNNF; the current total is close to that now. Over decades, regenerating aspen was expected to level at approximately 74,400 acres; however, current levels are approximately 20,000 acres (30%) less than that estimate. During the development of the 2004 Forest Plan, approximately 74,000 acres of regenerating aspen were anticipated by the end of the first decade of Plan implementation (approximately year 2014).

The trend in regenerating aspen for FY 2012 is expected to be consistent with the gradual decline seen in the previous years (see Figure 7). Of the aspen comprising the regenerating aspen cohort, roughly 16,200 acres (30%) are within three years of aging beyond the 20 years. In 2012, approximately 5,300 acres will move out of the 0-20 year age class. The amount moving into the age class will depend on how many acres in timber sales already under contract are harvested and the regeneration success in those stands. In opposition to the downward trend, a decision to implement the Early-Successional Habitat Improvement project was signed in early 2012. The project

authorizes regeneration of over 6,000 acres of aspen stands across the CNNF in the upcoming years. Additionally, aspen stands will be harvested and regenerated under the signed decisions of other vegetation management projects across the CNNF.

Mature Northern Hardwood Interior Forest

Mature northern hardwood interior forest is a community expected to provide habitat for forest interior species such as black-throated blue warblers, least flycatchers, goshawks, red-

shouldered hawks, and American marten. It is also an indicator of landscape pattern. During the forest plan revision, we determined that the forest landscape pattern was "outside the estimated range of variation." Past management that emphasized early successional forest types and edge habitat resulted in a landscape pattern

predominated by small patches. Large patches and interior conditions are generally lacking, and species that were once common such as hemlock and yellow birch are much less common. Aspen has become much more abundant.

The Forest Plan emphasize the maintenance of interior forest conditions, restoration of large patches across the landscape, increasing mid- to late-successional forest habitat and decreasing the representation of early successional habitat.

We define mature northern hardwood interior forest and associated patches using the following criteria (Quinn and Lopez 2006a):

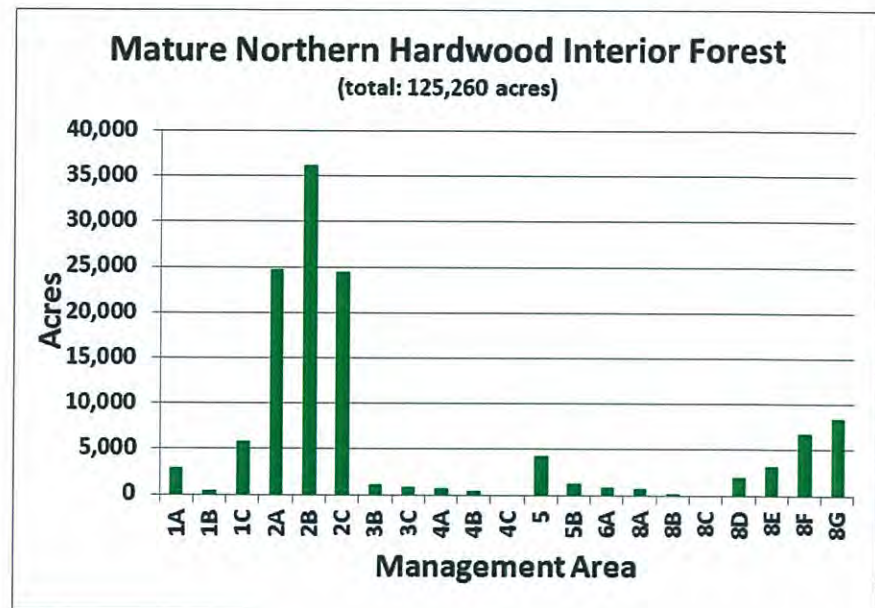


Figure 8. Acres of mature northern hardwood interior forest by management area on the Chequamegon-Nicolet National Forest during 2011.

- ♦ Northern hardwood is made up of forest stands typed as mixed northern hardwoods-hemlock, sugar maple-black cherry, sugar maple-northern red oak, sugar maple-yellow birch, sugar maple-basswood, black cherry-white ash/ yellow poplar, red maple, sugar maple, beech, and mixed hardwoods
- ♦ Mature is identified as greater than 80 years old or unevenaged and size density of 6 or 9.
- ♦ Inclusions of other forest types (including lakes and non-mature NHwds) that are less than 5 acres are counted as part of the mature northern hardwood patch; larger inclusions (including private land regardless of cover type) are not.
- ♦ Mature northern hardwood patches are not split by stand or district boundaries, but are split by roads of ML 345 and major rivers.
- ♦ The interior forest is identified by buffering the inside edge of the mature NHwd patch (and wherever the patch is split) by 90m so that the mature northern hardwood interior forest is more than 90m from waterbodies, major rivers, major roads, nonFS land and also 90m from areas of different forest type or age.



Photo 8. Mature northern hardwood interior forest

In 2011, the Chequamegon-Nicolet National Forest had approximately 125,260 acres of mature northern hardwood interior forest, with the majority of these acres occurring in management area 2 (Figure 8). Overall, this represents an increase of approximately 4,400 acres from last year (4% increase) and a 35% increase since 2004. This increase was anticipated during the forest plan revision process because many of the hardwood stands were on the cusp of turning 80 years old. As a result, the Forest is on target to reach 140,000 acres of mature northern hardwood interior forest projected in the forest plan within 20 years (forest plan FEIS, p. 3-102). Mature northern hardwood interior forest is increasing on the forest at a rate similar to that predicted by the forest plan FEIS.

Mature Natural Red and White Pine Forest

Mature natural red and white pine forest communities are expected to provide habitat for a number of songbirds including pine warbler, Blackburnian warbler, and red-breasted nuthatch. Mature natural red and white pine forests are stands dominated by either red or white pine of natural origin (i.e., not plantations), and at least 70 years old. This definition assumes that red and white pine forests originating prior to 1933 are of natural origin (presumably after a fire), and most of those originating after 1933 were planted (Quinn and Lopez 2006b). In 2011, 134,330 acres of red and white pine-dominated stands existed on the Forest (Table 7). About 64,432 acres (48 percent) are mature pine (at least 70 years old);

approximately 23,589 acres (37 percent) of these stands are considered to be of “natural origin.” During the 1940s and 1950s, thousands of acres were planted to red and white pine. While these trees will eventually contribute to the abundance of mature red and white pine, these stands are not of natural origin. More recent silvicultural efforts have been focused on regenerating “natural” red and white pine but it will be some years before the Forest will have an increase in mature “natural-origin” red and white pine forests. Because red and white pine stands on the Chequamegon-Nicolet National Forest are managed on 100- to 200-year rotations, mature red and white pine forest is expected to remain at current levels until 2021 (barring natural disasters).



Photo 9. Mature natural red and white pine forest

Table 7. Summary of the acreage of mature, natural-origin red and white pine stands on the CNNF.

Ranger District	2004 acres (total)	2011 acres (total)
Medford-Park Falls (Park Falls landbase)	1,575	1,653
Great Divide	3,146	3,166
Eagle River-Florence	8,388	8,482
Lakewood-Laona	2,387	2,659
Washburn	7,510	7,629
Chequamegon-Nicolet National Forest	23,006	23,589

Pine Barrens

Management Area 8C (Moquah Barrens)

The Moquah Barrens (MA 8C) on the Washburn Ranger District are composed of a large contiguous core area of about 13,000 acres and several smaller, unconnected barrens areas referred to as “satellite barrens.” The satellite barrens, which are included in management area 4C, total approximately 2,000 acres.



Photo 10. Moquah Barrens, Washburn Ranger District

The desired future condition of the barrens includes a continually changing savanna-type community with canopy closure that varies from mostly open to 50 percent closure (scattered clumps of trees). Inclusions of northern dry forest and northern dry mesic forest are found on loamy sand soils within the Moquah Barrens area.

Restoration projects in the Moquah Barrens have been occurring under the 2009 Northwest Sands Restoration Project Decision covering actions over a fifteen year period. The Northwest Sands project prescribes timber harvest and prescribed fire to create the vegetation structure composition of a pine barrens ecosystem. Overall, implementation of the project has been proceeding as planned.

Prescribed fire has been an important tool in the restoration of portions of the Moquah Barrens since 1963. Prescribed burns have been accomplished at return intervals ranging from 2 to 29 years (average = 8 years) on 24 different burn units (approximately 6,700 acres), to maintain open savanna habitat. Portions of the Moquah Barrens have been burned up to seven times. Most (65 percent) of the prescribed burns have been implemented in spring (April – May) with the remainder occurring in summer (20 percent) or fall (15 percent). When prescribed burns can occur is often influenced by weather, funding, and other constraints, so the seasons of burns, and intervals between burns, vary widely within and between the burn units.

Results from permanent vegetation monitoring plots (FIREMON; Posner & Hildebrandt 2006) have shown an increase in fire-adapted pine barrens vegetation as well as a decrease in non-fire-adapted vegetation with a corresponding increase in prescribed fire. The monitoring data have also provided insight into changes in abundance and heights of woody vegetation after prescribed fire (Table 8). This data is important for predicting how quickly a portion of the Moquah Barrens will reach a prescribed fire trigger point. Resource managers can use this data to determine when the next prescribed burn will need to be used on a certain portion of the Moquah Barrens (Bushman 2011).

Table 8. Desired and existing conditions of the Moquah Barrens core area.

Component	Brief description	Desired condition	FY 2009 condition	FY 2011 condition
Open barrens	Very open (<1 tree/ acre) < 50% total brush cover and <30-50% and brush cover under 7 feet tall (brush is defined as tree seedling and saplings as well as shrubs capable of reaching 3 feet of height) Desired tree species = red, white, & jack pine	50 to 75% in general equal representation of each	23%	24%
Savanna	Mostly open (1-40 trees/acre) < 50% total brush cover and <30% brush cover under 7 feet tall Desired tree species = red, white, & jack pine		23%	28%
Woodland	A park like forest (40-95 trees/acre) < 50% total brush cover and <30% brush cover under 7 feet tall Desired tree species = red & white pine	15 - 30%	9%	9%
Closed forest	Typical forest conditions (>95 trees/acre) < 50% total brush cover and <30% brush cover under 7 feet tall Desired tree species = red & white pine	5 - 15%	33%	28%
Dense small trees	Many small trees, difficult to walk through Desired tree species = jack pine	5 -10%	12%	11%

Note: Other fire-adapted tree species such as oak, aspen and birch will be present within all components; however, the dominant desired tree species are pine.

Barrens restoration has benefitted the sharp-tailed grouse population in the Moquah Barrens over the past decade and has complimented work done elsewhere in Bayfield County (e.g. Barnes area west of Drummond) where sharp-tailed grouse habitat management projects have been implemented.

Comparison of Projected and Actual Outputs and Services.

To move the ecological conditions on the Chequamegon-Nicolet National Forest toward the desired future conditions outlined in the forest plan, it is often necessary to manage vegetation using appropriate treatments. During the forest plan revision process, we established required vegetation treatments to achieve the desired species composition, age class distribution, and Forestwide goals and objectives (see Table 3-71a in the FEIS). Below is a comparison of the projected outcomes anticipated in the forest plan and the actual outcomes from 2006 to 2011.

Comparing Projected and Actual Vegetation Treatments

In fiscal year 2011, roughly 38% of the projected number of acres of vegetation treatment (all types) was accomplished (Table 9). Roughly 58 and 54 percent of the annual projection was accomplished during fiscal years 2009 and 2010, respectively, with the greatest shortfall coming in the selection and shelterwood treatments. In 2011, timber harvest treatments were all well short of the projections from the Forest Plan (Table 9).

Table 9. Projected annual rate of vegetative treatment during the first decade of forest plan implementation and actual acres treated by treatment type since fiscal year 2006.

Vegetation treatment	Annual rate projected (acres)	Acres treated					
		2006	2007	2008	2009	2010	2011
Intermediate cut	7,100	4,510	6,159	6,957	3,445	4,327	2,781
Selection	7,530	1,502	1,423	968	590	1,331	959
Shelterwood	1,490	973	1,233	673	901	120	163
Clearcut	3,980	1,936	2,250	2,264	4,005	2,034	837
Site preparation for planting	640	727	1,266	1,755	1,127	1,153	791
Planting/underplanting	1,250	934	917	1,382	1,417	1,251	793
Site preparation - natural regeneration	4,210	2,747	1,630	3,750	2,630	3,053	2,041
Release	1,250	1,192	636	832	796	568	778
Pruning	200	0	0	0	37	60	12
Seedling protection	200	7	1,040	1,454	1,305	1,309	1,344
TOTAL	27,850	14,528	16,554	20,035	16,253	15,206	10,499

Comparing Projected and Actual Allowable Sale Quantity

Allowable sale quantity (ASQ) is the maximum quantity of timber based on funding levels that may be harvested from sustainably managed land suited for timber production during a given period. Appendix GG of the Forest Plan (Forest Plan, p. G-11) displays the projected ASQ for various products for each of the next five decades. The ASQ projected in the Forest Plan assumes that the CNNF is fully funded and has the resources necessary to sell the maximum amount of timber. Since the Land and Resource Management Plan ROD was signed in 2004 (USDA-FS 2004b), the CNNF has not been funded such that ASQ can be met.

In one species/product group (softwood sawtimber), the Chequamegon-Nicolet National Forest exceeded the average annual ASQ projected in the Forest Plan but in all others, due to diminishing funding levels, production was far short (table 10). More softwood sawtimber was produced than was projected during Forest Plan development because of salvage of red pine blowdown, the unforeseen Spruce Decline epidemic discussed previously, and because red pine thinning projects took the place of the hardwood thinning projects that were delayed by challenges to the environmental analysis from 2006-2008. Overall, the timber volume harvested in 2011 was approximately 39% of the ASQ level (131 million board feet).

Table 10. Volume (million board feet) of timber harvested on the Chequamegon-Nicolet National Forest from 2009-2011.

Species/product group	Average allowable sale quantity projected*	Volume harvested		
		2009	2010	2011
Hardwood Sawtimber	7.6	1.03	1.89	1.26
Softwood Sawtimber	8.8	11.27	10.66	9.43
Hardwood Pulpwood	53.2	18.86	13.72	14.94
Softwood Pulpwood	29.9	23.59	20.32	12.70
Aspen Pulpwood	31.3	15.12	15.69	13.10
Total	131.0	69.87	62.28	51.43

*Annual average based on a 10-year life of the forest plan (see page 2-66 of FEIS)

The volume sold from 2005 to 2011 shows a decreasing trend and is currently below 60% of the projected maximum amount of timber that could be sold. The volume of timber sold, however, has closely matched the allocated budget for timber sales, by volume (Figure 9) since 2005. The greatest departure from this close relationship came in 2011 when the volume sold in 2011 was similar to year 2010 but funding levels were greater in 2011 than in 2010 (Figure 9). In 2011, the additional funding for the timber program was spent on the preparation of timber sales (cruising and marking) for Fiscal year 2012 in which many timber sales were offered and the actual volume sold is expected to be near 79 million board feet.

The close relationship between timber funding and output reflects the CNNF's recognition of and commitment to the economic importance of timber and forest products to local, state, regional, national, and, to some degree, international markets. As of August 2012, the volume of timber in vegetation management projects that has been through the environmental planning and analysis stages exceeds 350 million board feet (MMBF) and represents a mix of forest types and species/product types. This standing timber awaits cruising, marking and sale package preparation.

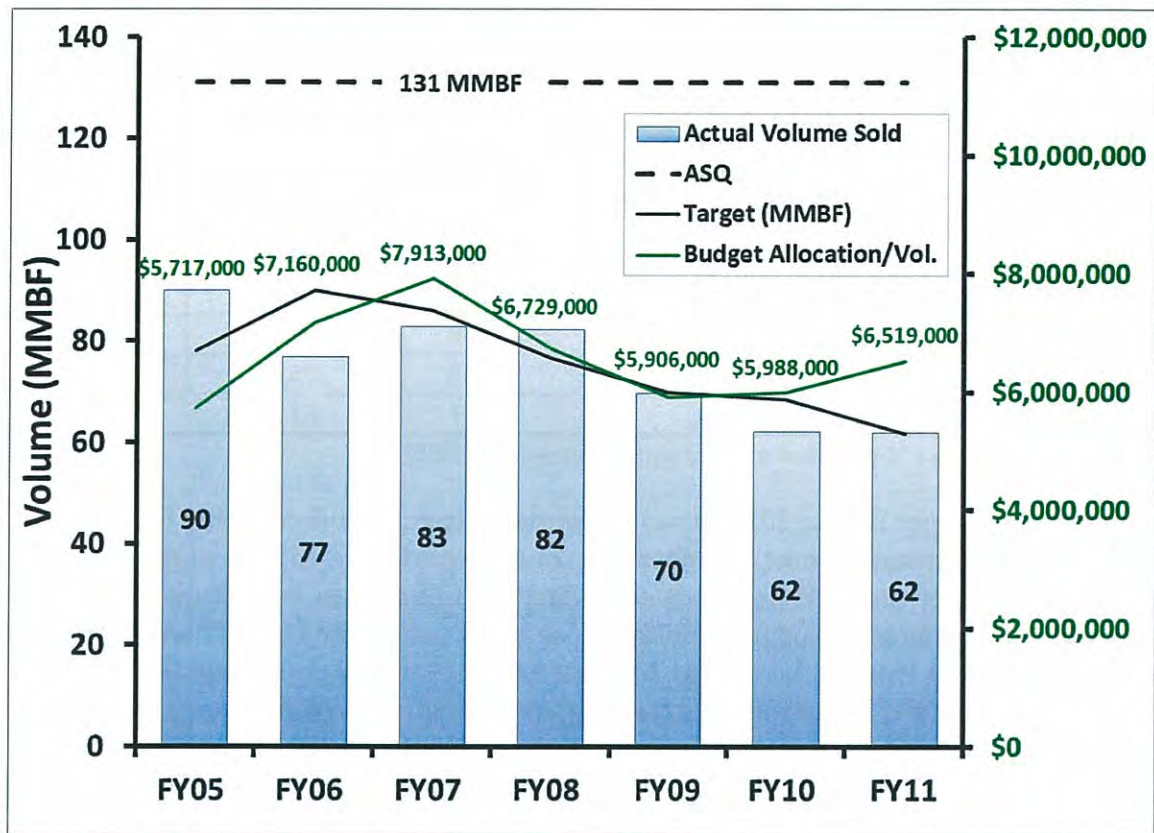


Figure 9. Projected volume versus actual volume sold and funding level from 2005 to 2011 for the Chequamegon-Nicolet National Forest.

Comparison of Actual and Estimated Costs

The cost of full forest plan implementation in 2004 was estimated to be \$29,561,700 annually (not adjusted for inflation; USDA-FS 2004c, table 2-22). Since we completed the forest plan final environmental impact statement, the methods of tracking costs have changed and the FEIS estimate does not necessarily translate to the current budget divisions. Nevertheless, the intention of this monitoring item – to compare the estimated costs with actual costs – can still be fulfilled because estimated costs are made annually before the final or actual budget for that fiscal year is issued. During fiscal year 2011, the Forest operated two percent below what was estimated at the beginning of the fiscal year (table 11). The budget trend from fiscal years 2009 to 2011 is decreasing (figure 10). The FY 2011 budget allocation was approximately 39% less than what was projected during the 2004 Forest Plan revision.

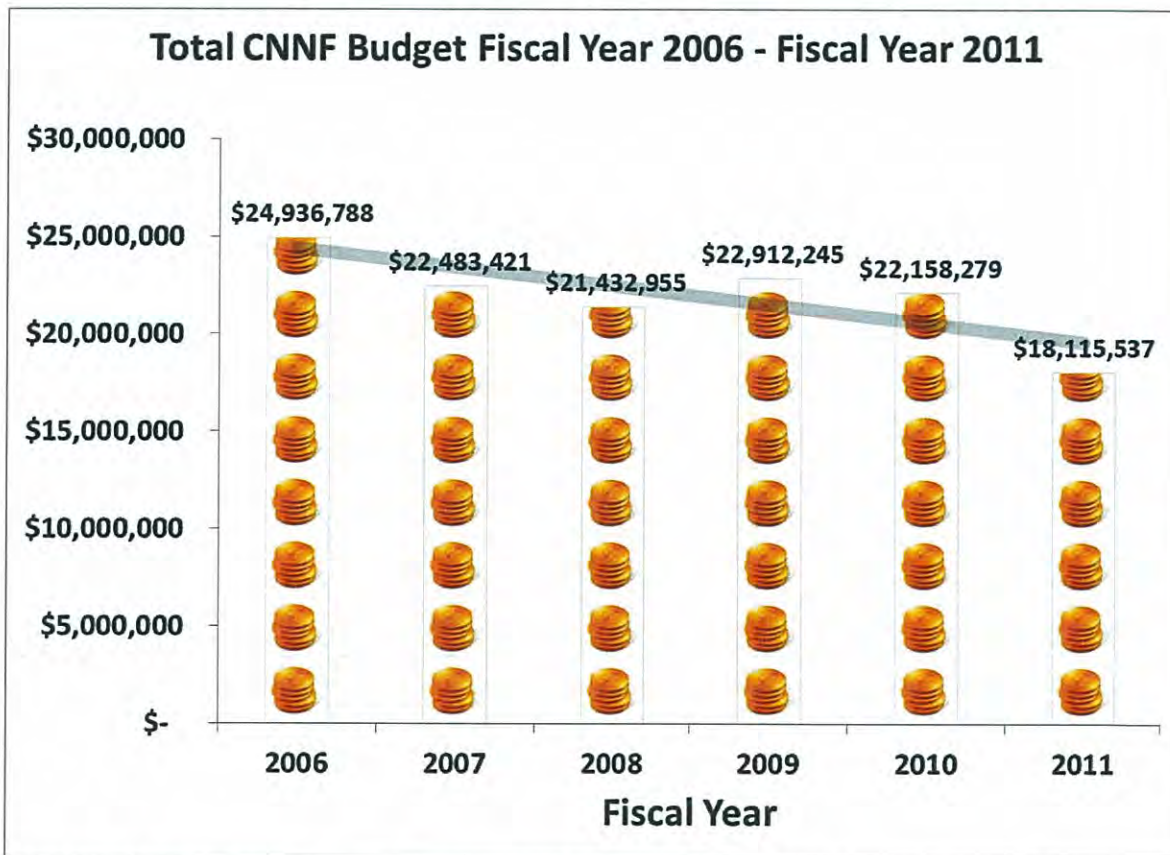


Figure 10. Chequamegon-Nicolet National Forest annual budget from fiscal years 2006 to FY2011.

Table 11. The estimated and actual costs for Chequamegon-Nicolet National Forest program operations for fiscal year 2011.

Program description	2009 Actual (\$)	2010 Actual (\$)	2011 Estimated (\$)	2011 Actual (\$)
Inventory and monitoring	\$ 814,200	\$ 620,000	639,697	634,247
Land management	482,600	435,387	405,547	415,473
Minerals and geology	193,500	184,000	186,000	194,043
Planning	105,000	105,000	84,000	87,866
Recreation/wilderness/ heritage	1,628,956	1,533,078	1,585,587	1,571,485
Timber	4,240,737	4,209,989	4,621,702	4,642,755
Vegetation, watershed and air	845,300	633,048	686,097	675,680
Wildlife	1,029,924	884,339	923,257	859,316
Reforestation	239,100	200,000	189,000	167,129
Salvage sales	1,150,000	492,623	714,000	681,252
Timber pipeline funds	413,000	1,607,000	1,026,000	1,038,539
Roads and trails for States	42,000	88,000	115,000	91,269
Hazardous fuels reduction	260,000	260,000	328,644	287,302
Fire protection and preparedness	1,680,933	1,703,923	1,571,074	1,559,692
Facilities maintenance - recreation	127,000	226,200	267,872	258,084
Road maintenance and construction	3,316,595	3,776,909	2,135,011	2,173,530
Trail maintenance	230,000	310,814	267,394	253,408
Administrative facilities maintenance	690,800	411,325	415,000	407,075
Knutsen-Vandenberg (KV) fund	1,310,000	1,107,935	1,039,000	884,873
KV regional projects	582,000	350,000	228,000	229,210
Funds for purchase of lands	2,550,800	2,210,000	234,000	230,812
Fee demo - recreation collections	132,000	-	-	-
Fee demo – rec. site maintenance	626,550	716,709	704,000	657,300
Forest health management	30,000	32,000	33,000	34,844
Rehabilitation and restoration	66,000	25,000	41,000	12,312
Administrative and visitor maps	31,000	30,000	12,500	15,627
Stewardship projects	94,250	5,000	57,500	52,403
Total	\$22,912,245	\$22,158,279	\$18,509,882	\$18,115,537

CHAPTER 2

GOAL AND OBJECTIVE MONITORING

Monitoring accomplishments for fiscal year 2011 and relevant trend information from previous years are presented in this chapter. Not every action on the CNNF is monitored and the monitoring data that are collected do not necessarily meet the statistical rigor of formal research. Budgetary constraints affect the level of monitoring that is accomplished in any given year.

The organization of this chapter mirrors chapter 1 of the forest plan ("Forestwide Goals and Objectives") where objectives are designed to help achieve the stated goals. For a comprehensive list of monitoring objectives to be conducted throughout the life of the Forest Plan, please refer to table 4-2 in the Forest Plan.

Threatened, Endangered and Sensitive Species

Objective 1.1a: Under the Endangered Species Act (ESA), implement established recovery or conservation strategies.

As directed by Forest Service Manual (2670), populations of species of federal concern are monitored on an annual basis. We monitor gray wolf¹ (*Canis lupus*), Canada lynx (*Lynx canadensis*), and bald eagle² (*Haliaeetus leucocephalus*; now delisted) collaboratively in partnership with the Wisconsin Department of Natural Resources. This monitoring includes aerial surveys (both), winter track surveys, live trapping, and howling surveys (in the case of gray wolves) to evaluate species presence and absence, population status, and habitat use. We use information from this monitoring effort to determine how well we are achieving forest plan standards and guidelines concerning conservation of the species, needs for additional protections, and to provide information to the U.S. Fish and Wildlife Service as required by the Endangered Species Act of 1973(as amended).

The Chequamegon-Nicolet National Forest is a strong partner in the recovery of federally listed species that reside on National Forest System lands. In 2011, Forest personnel coordinated with the Wisconsin Department of Natural Resources in the continued monitoring of gray wolf and Canada Lynx. In addition, surveys for Kirtland's Warbler (*Dendroica kirtlandii*) were conducted on the Washburn Ranger District. Two known stations of Fassett's locoweed (*Oxytropis campestris* var. *chartacea*) were also monitored on the Washburn Ranger District.

¹ Discussion of the gray wolf can be found in the previous chapter under "Management Indicator Species."

² Discussion of the bald eagle can be found in the previous chapter under "Management Indicator Species."

Canada Lynx (*Lynx canadensis*)

Canada lynx is considered a potential visitor, not a resident federally listed species on the Chequamegon-Nicolet National Forest (USDI Fish and Wildlife Service 2008). No lynx are currently known to inhabit the Forest and no lynx analysis units or critical habitat have been designated on the Chequamegon-Nicolet National Forest by the U.S. Fish and Wildlife Service. The Forest conservation strategy revolves around maintaining current elements of lynx habitat and conducting detection surveillance.

Because the Canada lynx is considered by the U.S. Fish and Wildlife Service to be transient species on the Forest but could occur here in any given year, monitoring for lynx is conducted as part of other monitoring actions. We use winter carnivore track surveys on established routes across the Forest to gather presence and absence information of carnivores. If a suspected Canada lynx is detected via these counts or through observations of the public, Forest personnel work with the Wisconsin Department of Natural Resources to investigate the sightings. Hair or scat samples can be sent to a genetics lab for confirmation of the species. Since 2004, we have investigated six possible detections with the WDNR but we have not confirmed lynx presence.



Photo 11. Canada lynx (photo: Tim Catton)

Lowland conifer swamps (balsam fir-spruce-cedar) are considered potential habitat for Canada lynx. Lowland conifer habitat provides boreal-like conditions and sustains desirable prey such as snowshoe hare, ruffed grouse, and small mammals. This habitat type is not actively managed on the Forest via timber harvesting. Consequently, habitat availability remains relatively stable on the CNNF over time.

Kirtland's Warbler (*Dendroica kirtlandii*)

The Kirtland's warbler was one of the first species listed as endangered under the Endangered Species Act of 1973. The 1981 Kirtland's Warbler Management Plan for Habitat in Michigan established the goal of a self-sustaining population of 1,000 pairs within their primary breeding range in Lower Michigan.



Photo 12. Kirtland's warbler

As recovery actions have been carried out, this species has exceeded the population recovery goal of 1,000 pairs since 2001 and continues to expand into new habitat areas in the Upper Peninsula of Michigan and Wisconsin. Forest staff, in cooperation with the U.S. Fish and

Wildlife Service, Green Bay Ecological Services Office, began surveys in suitable habitat in 2007 and continues to conduct Kirtland's warbler surveys on the Washburn Ranger District. Forest staff selected this area because it most closely mirrored accepted habitat conditions suitable for the species. Kirtland's warblers are habitat specialists, breeding only in dense 5- to 20-year-old jack pine forests on well-drained sandy soils. After a sighting in spring of 2008 on the Washburn Ranger District, this species was added to the Forest's list of federally threatened and endangered species for management consideration and consultation under ESA.

After detection of the warblers in 2008, Forest biologists completed a habitat analysis (Eklund et al. 2008) in coordination with the U.S. Fish and Wildlife Service to evaluate the current availability of habitat on the Forest and potential for creating new habitat. The analysis concluded the best available habitat existed on the Washburn Ranger District and, in December 2010, a habitat improvement project affecting several hundreds of acres was approved (USDA-FS 2010). Implementation of the project is ongoing.

Fassett's locoweed (*Oxytropis campestris* var. *chartacea*)

Fassett's locoweed is a perennial shoreline plant in the pea family; it depends on open habitat provided during times of low lake levels and a large seed bank of dormant seeds in the soil for long-term population maintenance. The species was added to the U.S. list of endangered and threatened wildlife and plants in 1988 after which the U.S. Fish and Wildlife Service prepared a recovery plan.

Two locations of Fassett's locoweed occur within the Washburn Ranger District. We visit these locations annually to document whether the plant is active or dormant, and the extent of its occupation.

In 2009, the lake levels at the historic location or dormant location for Fassett's locoweed had been significantly lowered to the point where the lake bottom sediments and sandbars were exposed. It was during this time that we discovered new populations of Fassett's locoweed. Small patches of locoweed with a few individuals were visible, as well as larger patches, the size of a standard living room. Estimated population size in 2009 was 4,285 individual plants and in 2010 over 5,000 plants. A quick estimate of the number of seed that the locoweed could produce in 2009 would be somewhere near or over a million seeds as many plants had numerous stems with many seedpods.

Due to drought conditions over the past eight years in northwest Wisconsin, the amount of water in lakes with populations of Fassett's locoweed has decreased substantially exposing more habitat. This stimulated thousands of long-dormant locoweed seed to sprout but, unfortunately, non-native Canada thistle, bull thistle, and common mullein also colonized the area (Photo 14). In 2011, these invasive plants were hand-pulled from the locoweed populations



Photo 13. Fassett's locoweed at Pigeon Lake (photo: Steven Spickerman)

(approximately 20 acres). If invasive species at these sites can be kept in check, the native plants occupying the habitat (including the Fassett's locoweed) may be able to flourish. If water levels keep rising as they did in 2011, both the Fassett's locoweed and the invasive plants will be flooded out. It is uncertain if the invasive plant seed can remain viable beneath the water as the locoweed's can. The last time water levels were this low was in the 1930's.

The forest plan standard for managing Fassett's locoweed states: "Protect and manage all known plant sites utilizing Fassett's Locoweed Recovery Plan (USDI-FWS 1991) direction. All land use activities (except population monitoring and those activities necessary to protect the site) will be excluded from water's edge to the high-water mark and within a buffer zone of 200 feet inland from the high-water mark for locoweed populations."

The existing populations do not occur on the Chequamegon-Nicolet National Forest; they are on adjacent state-owned land.

The CNNF works cooperatively with the landowners on these lakeshores to implement the recovery plan. Both locations have signs surrounding the boundary of the occupied areas, informing the public of the plant and prohibiting travel and use of the areas. In addition, Forest personnel conduct surveys, and remove any nonnative invasive species located within a distance deemed harmful to maintaining this listed plant species.



Photo 14. Exposed lake-bed, Fassett's locoweed habitat invaded by non-native plants in summer 2011.

Objective 1.1b: Improve habitat conditions for Regional Forester Sensitive Species (RFSS)

Regional forester sensitive species are those species that are of conservation concern due to population decline, habitat loss, or are sensitive to management changes. The forest plan states that habitat conditions for Regional Forester-designated sensitive species will be monitored and evaluated at least every 5 years. It is not feasible to conduct such an assessment for each species annually. Consequently, only a fraction of the results of monitoring of sensitive species populations and their habitats is presented in each annual Forest monitoring report. Which species are highlighted in any given report is determined by a number of factors including whether targeted monitoring for that species or management actions affecting the species' habitat occurred in that year and the level of public interest in the species.

Monitoring of RFSS and their habitat occurs through the following:

- ♦ Monitoring of known occupied sites and populations (e.g. ginseng and *Botrychium* site monitoring)
- ♦ Pre- and post-project surveys (e.g. upland flora pre-project surveys and woodland raptor nest monitoring)
- ♦ Collaborative surveys with partners (e.g. carnivore winter track surveys)
- ♦ Research (e.g. spruce grouse habitat use research by WDNR)
- ♦ General surveillance surveys (e.g. Annual Nicolet Breeding Bird Survey)
- ♦ Opportunistic observation (e.g. road-killed animals and trail camera photos)

American Marten

The marten restocking project on the Great Divide Ranger District continued in 2011 with the release of additional animals from northern Minnesota. Winter track counts (2010-2011) for marten in both the Chequamegon Marten Protection Area (MPA) and the Nicolet MPA. No incidentally trapped martens were reported from the 2010-2011 trapping seasons (WI Marten Committee notes 8/9/2011). The amount of habitat judged suitable for marten has remained relatively stable with a slightly increasing trend over the past decade (Figure 11). Stand maturation is responsible for the increasing trend; stand age is a criterion in the definition of suitable habitat.

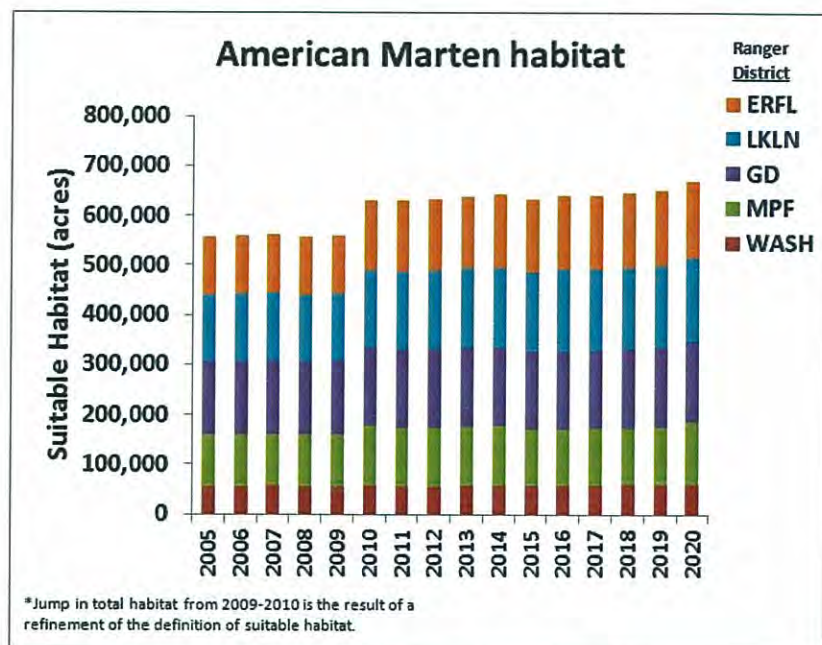


Figure 11. Suitable habitat for American Marten across the Chequamegon-Nicolet National Forest from 2005 to 2011 and projected habitat availability to year 2020.

Northern Goshawk and Red-shouldered Hawk

Northern goshawk and red-shouldered hawk habitat availability has been relatively stable across the Chequamegon-Nicolet National Forest for the past decade and is projected to remain so into the foreseeable future (Figures 12 and 13). Northern hardwoods forest comprises the majority of the suitable nesting habitat for these two woodland raptors on the CNNF. The majority of that habitat is managed through uneven-aged silvicultural systems resulting in the maintenance of suitable conditions. Stand structure (tree species diversity, within-stand tree size diversity, accumulated woody debris, etc.) continues to develop in these stands.

Spruce Grouse

Habitat for spruce grouse in northern Wisconsin includes lowland conifer habitat (specifically black spruce peatlands) as well as upland short-needled conifer habitat adjacent to these conifer lowlands. Lowland conifer habitat are not actively managed (e.g.

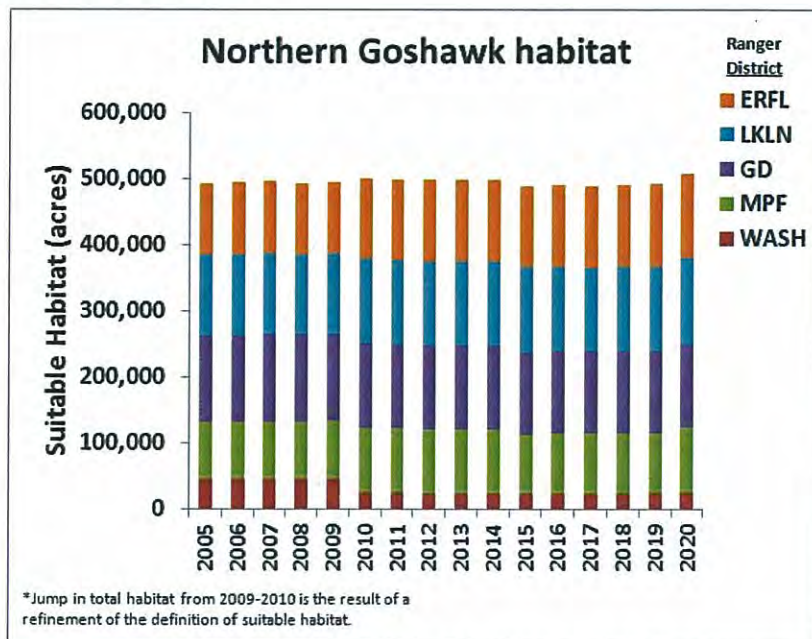


Figure 12. Suitable habitat for Northern Goshawk across the Chequamegon-Nicolet National Forest from 2005 to 2011 and projected habitat availability to year 2020.

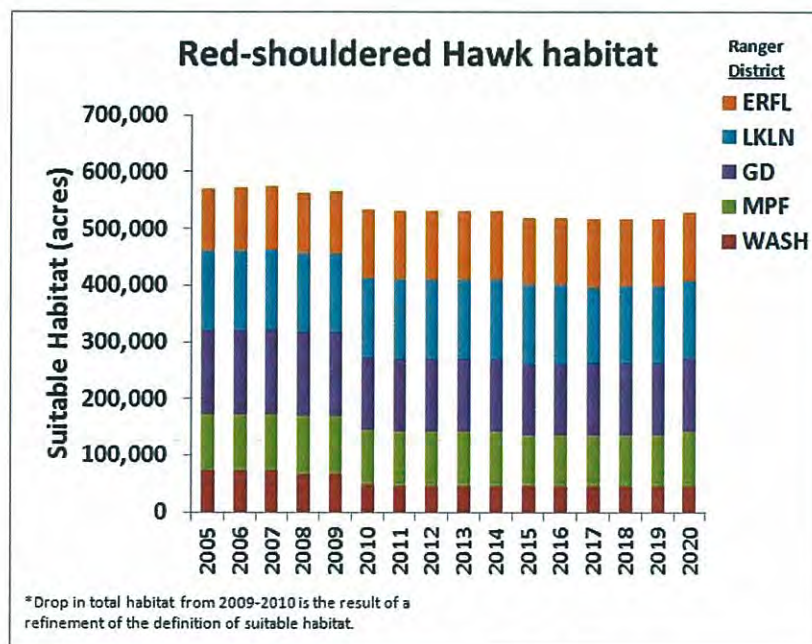


Figure 13. Suitable habitat for Red-shouldered Hawk across the Chequamegon-Nicolet National Forest from 2005 to 2011 and projected habitat availability to year 2020.

timber harvesting) but some upland short-needled conifer habitat adjacent to these areas have been managed and more are proposed for management in the foreseeable future. Spruce grouse are known only from the Eagle River-Florence Ranger District on the Nicolet landbase and from the Great Divide landbase on the Chequamegon landbase; these two districts provide the majority of the suitable habitat on the Forest (Figure 14). The amount of suitable habitat on the CNNF, overall, is relatively stable with some losses of habitat resulting from

upland conifer habitat aging to the point they no longer provide the habitat conditions favored by spruce grouse. Some upland short-needled habitat (e.g. jack pine) has been created adjacent



Photo 15. Spruce grouse (photo credit: Ray White).

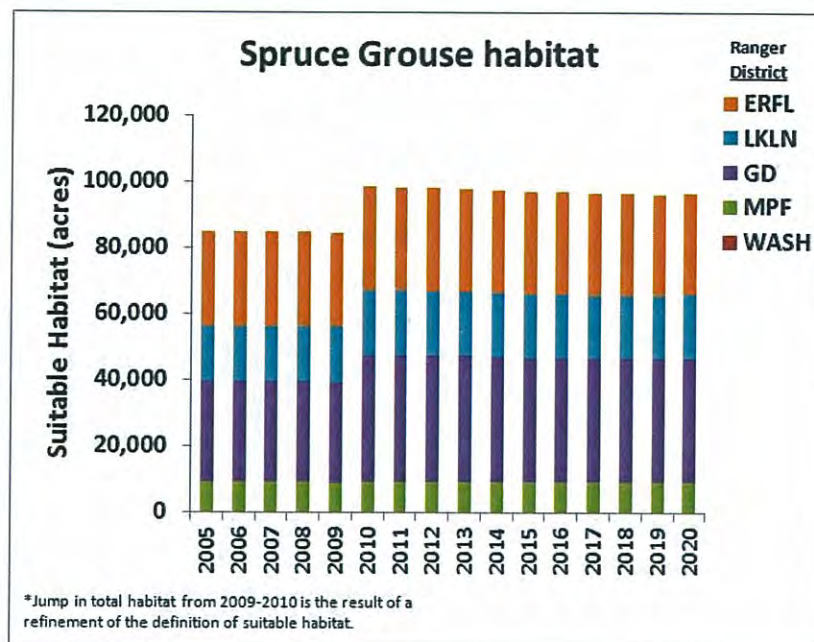


Figure 14. Suitable habitat for Spruce Grouse across the Chequamegon-Nicolet National Forest from 2005 to 2011 and projected habitat availability to year 2020.

to lowland conifer complexes in the past five years; these additions have largely resulted from the reforestation of stands salvaged from the spruce decline disease discussed previously (page Error! Bookmark not defined.)

West Virginia White

Toothwort (*Cardamine* sp.) is the larval host plant for the West Virginia White butterfly. Toothworts can be found in the rich northern hardwoods forest on the CNNF but is more common on the Nicolet landbase than on the Chequamegon. Most of the occurrences of West Virginia Whites on the CNNF have been on the Nicolet landbase. Suitable habitat for the species has been relatively stable on the CNNF (Figure 15) and is projected to remain stable or increase over the next ten years. The

stability and possible increase in suitable habitat is attributed to the maturation of northern hardwood stands; toothwort favors closed-canopy forest; older stands of hardwoods have had closed canopy conditions longer than younger stands and, thus, are more likely to have toothwort populations. Much of the northern hardwoods stands on the CNNF are managed through uneven-aged silvicultural systems which maintain the suitability of the habitat for

toothwort and West Virginia Whites.



Photo 16. West Virginia White butterfly (photo credit: Mike Reese).

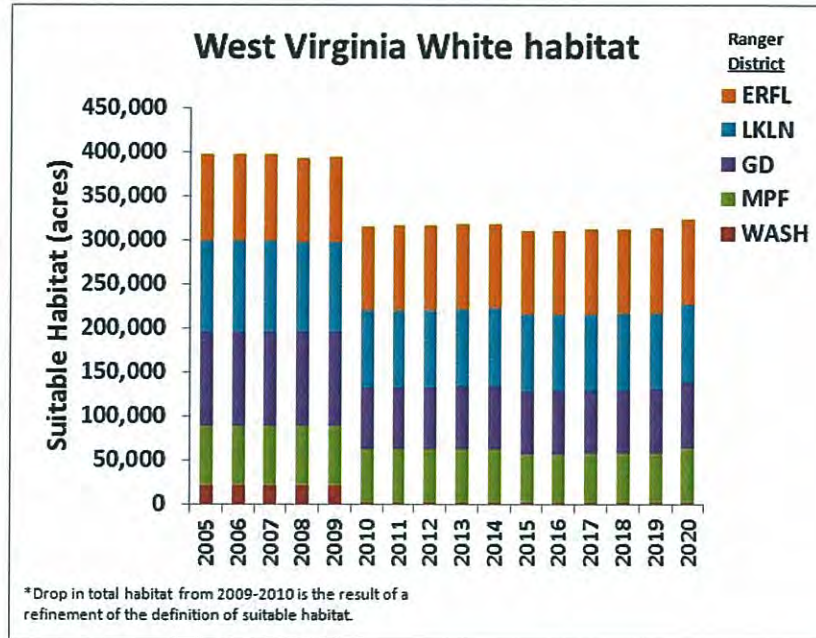


Figure 15. Suitable habitat for West Virginia White butterflies across the Chequamegon-Nicolet National Forest from 2005 to 2011 and projected habitat availability to year 2020.

American Ginseng, Goblin Fern and Mingan's Moonwort

The amount of suitable habitat for understory plant species that favor the closed canopy conditions of a northern hardwood forest, such as American Ginseng, goblin fern and Mingan's moonwort, has remained stable on the CNNF since 2004 and is projected to remain stable for the foreseeable future (Figures 16-18). In the assessments of the cumulative effects of vegetation

management on the availability of habitat to these species, short-term impacts of some timber harvest prescriptions (assumed five year period of unsuitable conditions due to lowering canopy closure below 80%) are expected to occur. Following the harvest, however, canopy closure again returns above 80% and the stand is again considered to be suitable habitat for the species. Where known populations of these species are known to exist, no-cut buffers surround the populations and the canopy closure is unchanged by the management actions.

Aquatic Ecosystems

Objective 1.3a: Reduce the number of road and trail stream crossings. Reduce sedimentation and improve fish passage in existing road and trail stream crossings.

In FY2011, seven stream crossings were reconstructed to reduce erosion, prevent future failures, improve fish passage, restore channel morphology³ and reduce maintenance (Table 12). Before and after photos of a representative site are provided below for Long Lake Outlet at Forest Road (FR) 2168.

Two stream crossings were replaced as part of the Legacy Roads and Trails Program (CMLG) including one that was also funded with GLRI, CMRD and partnership funds (Town of Morse, BRWA). That large project at FR 390 and Trout Brook included replacement of a severely undersized culvert with a

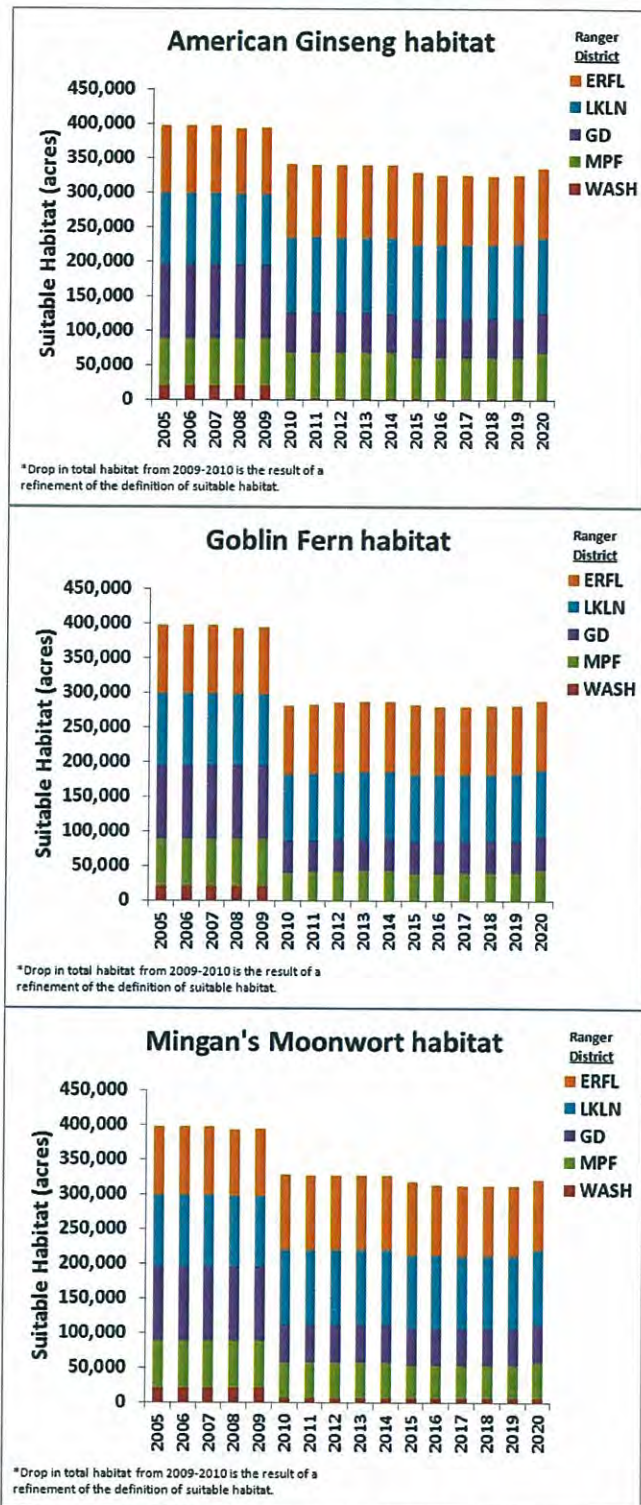


Figure 16-18. Suitable habitat for American Ginseng, Goblin Fern and Mingan's Moonwort across the Chequamegon-Nicolet National Forest from 2005 to 2011 and projected habitat availability to year 2020.

³ Channel morphology is the processes and functions that influence the shape and dimensions of a stream channel over time.

bridge and substantial road work to reduce erosion and sedimentation. The new culvert on Little Willow Creek replaced a crossing that had partially washed out the previous year. A third project was designed and trail bridge materials purchased for installation over the EB Lily R in 2012. Five crossings were replaced with GLRI funding. Stewardship and partner (Town of Long Lake) funds were also used for Long Lake Outlet at FR 2168 (Photos 17 and 18). For all other crossings, undersized culverts were replaced with a much larger structure set below streambed to ensure passage of aquatic organisms, restore channel morphology, reduce erosion and sedimentation, improve safety and reduce maintenance.

Table 12. Road and trail stream crossings reconstructed in fiscal year 2011.

Stream	Road or Trail	Project Activity	Prior Structure	Funding Source
Long Lake Outlet	FR 2168	20'x4' SSIM Conc Culvert	8'x2' Conc Culvert	GLRI, STW, P
Unt NF Thunder R	FR 2102	95"x67" Culvert	48" Circ Culvert	GLRI
Unt NB Oconto R	FT 942287	65"x43" Culvert	18" Circ Culvert	GLRI
Little Willow Cr	FR 130	13'10"x5'5" Alum Box	2-60" Circ Culverts	CMLG
Trout Brook	FR 390	30' Span SSIM Bridge	4' Circ Culvert	CMLG, GLRI, CMRD, P
Unt Trout Brook	FR 390 dwn	87"x63" Culvert	2-18' Circ Culvert	GLRI
Unt Trout Brook	FR 390 mid	87"x63" SSIM Culvert	18" Circ Culvert	GLRI

Note: Unt = Unnamed Tributary, FR=Forest Road, FT=Forest Trail, GLRI=Great Lakes Restoration Initiative, STW=Stewardship, CMLG=Legacy Roads and Trails, CMRD=Road Construction, P=Partner, SSIM=Stream Simulation (construct streambed through structure)

One old abandoned road-stream crossing was removed in 2011 to restore fish passage and channel morphology. It was located just upstream from Highway 64 on an unnamed tributary to the North Branch Oconto River. No other road or trail stream crossings were created or removed on the Forest in FY2011. There are approximately 950 road-stream crossings on level 3, 4 and 5 roads within the National Forest. The number of crossings on level 1 and 2 roads is less than 750 based on a geographic information system intersect of digital stream and road layers, but the actual occurrence and condition of these potential crossings are still being inventoried. There are also about 170 trail-stream crossings.

The forest plan provides further direction for roads and trails in riparian areas and wetlands through goals, objectives, standards and guidelines. The Forest has had a very active road and trail stream crossing program. Since 1998, we have replaced 197 crossings, reconstructed 15 road segments and worked on 9 trail segments. Stream crossings were reconstructed to reduce erosion, prevent further failures, improve fish passage, restore channel morphology and reduce maintenance. Informal and formal monitoring has occurred across the Forest. Informal monitoring of reconstructed crossings indicates that the culverts are functioning, there are no washouts and, where appropriate, aquatic organism passage has been restored.



Photo 17. Long Lake Outlet culvert before replacement in 2011; culvert controlled lake level, was ready to fail and impeded passage of fish and other organisms.



Photo 18. Downstream view of a new concrete box culvert at Long Lake Outlet on FR 2168. This larger culvert has a weir above the inlet to control lake level, a step-pool channel to restore aquatic organism passage and should require minimal maintenance.

The Chequamegon-Nicolet National Forest had an extremely ambitious program in 2010 when 26 road and trail stream crossings were reconstructed to reduce erosion, prevent future failures, improve fish passage, restore channel morphology, and reduce maintenance. Fourteen were funded by the Legacy Roads and Trails Program (CMLG), seven by the Great Lakes Restoration Initiative and five by the American Recovery and Reinvestment Act. The Little Popple crossing included construction of a simulated streambed through the culvert. The project also restored fish passage and stream alignment, and created a safe, low-maintenance crossing.

Objective 1.3e: Improve or restore habitat in streams and lakes.

Acres and Miles of Habitat Improved

In 2011, large woody debris restoration took place in three lakes: Northeast Lake (Bayfield Co., 22), Star Lake (Bayfield Co., 4) and Stevens Lake (Florence Co., 10). Trees were placed during ice-free conditions. Potential habitat projects in lakes are identified during fish surveys. In total 36 structures were installed in lakes during 2011 (Table 13). Little Cub Lake (Forest Co, 5 acres) was limed during the 2010/2011 winter. Little Cub Lake is limed annually to provide more suitable water quality conditions for the stocked trout fishery.

In-stream habitat restoration work occurred on seven trout streams within the Forest:

- Deerskin River
- Swanson Creek
- Round Creek
- McCaslin Creek
- Foulds Creek
- Twenty-mile Creek
- Brule River

Table 13. Activities conducted to improve habitat in streams and lakes in fiscal years 2009 and 2010

Improvement/restoration activities	2009	2010	2011
Acres of lake habitat improved	197	108	41
No. of lakes and streams monitored - fishery	34	34	34
Miles of stream habitat improved	243	243	243
No. of sites with permanent cross sections monitored	5	2	2
Aeration acres (10 lakes)	1,466	1,466	1,466

The work was a mixture of brush bundle placement, brushing and large wood placement. All work was done to restore habitat by narrowing the stream and improving habitat complexity. All work except that done on Twenty-mile creek was done in partnership with various chapters of Trout Unlimited and the Wisconsin Department of Natural Resources. Over three miles of in-stream habitat was improved for native brook trout. Approximately 240 miles were improved by maintaining free-flowing conditions through the management of beaver.

The final year of the three-year Brule River project was 2011. This cooperative effort among the Michigan DNR, WDNR, WE Energies and private landowners concluded with the placement of over 160 whole trees along a 1-mile stretch of the river in 2011. The trees came off of State of Michigan lands and were placed using a helicopter. The stretch adjoins the two miles of stream improved in the previous two years. Three index stations have been established to monitor changes in the fishery over time within the project area. High water in 2010 and warm water temperature in 2011 hampered fish survey efforts so there is limited fish community data to report at this time. Anglers have reported having great success within the three mile stretch.



Photo 19. Brush Bundle Construction on the Deerskin River during the Trout Unlimited (Northwoods Chapter) workday.

The winter of 2010/2011 was considered to be average. Dissolved oxygen (D.O.) levels were monitored in the 10 aeration lakes as well as over 25 additional waters. Ice-out occurred in at a normal time of mid-late April. There were no major fish kills from low D.O. on the Forest during the 2010/2011 winter. Some areas of the Forest are still in drought recovery, particularly the northeast portion of the Forest. Water levels in many seepage lakes in Bayfield, Forest, Vilas and Florence counties are still quite low. Overall fish community health continued to be good. Most species had good to excellent recruitment and fall fingerling size structure was average.



Photo 20. Bass using a tree drop in Butternut Lake (Forest County).

Objective 1.4g: Annually treat non-roadside and roadside NNIS sites.

In 2007, the CNNF developed a nonnative invasive species (NNIS) strategy to guide the Forest's efforts in controlling NNIS across the Forest. Currently, there are approximately 5,050 known occurrences of nonnative invasive plants; they occupy over 2,900 acres on the Chequamegon-Nicolet National Forest⁴ with the majority (80 percent) of these sites less than one acre. In 2011, there were 343 new occurrences documented (Figure 19). Since 2004, the number of new occurrences of nonnative invasive species within the Chequamegon-Nicolet National Forest peaked in 2007 at 1,106 sites. The increase in new discoveries from 2004 to 2007 was due, in part, to increased effort in locating invasive species on the National Forest. While the early detection effort continues, the focus of the nonnative invasive species program has shifted to treatment and control of known sites. Thus, the number of new sites since 2007 has decreased.

⁴ Infested acres reflect the area actually infested with nonnative invasive plants, and is measured by multiplying the gross area of infestation by the percent cover of the nonnative invasive plants.

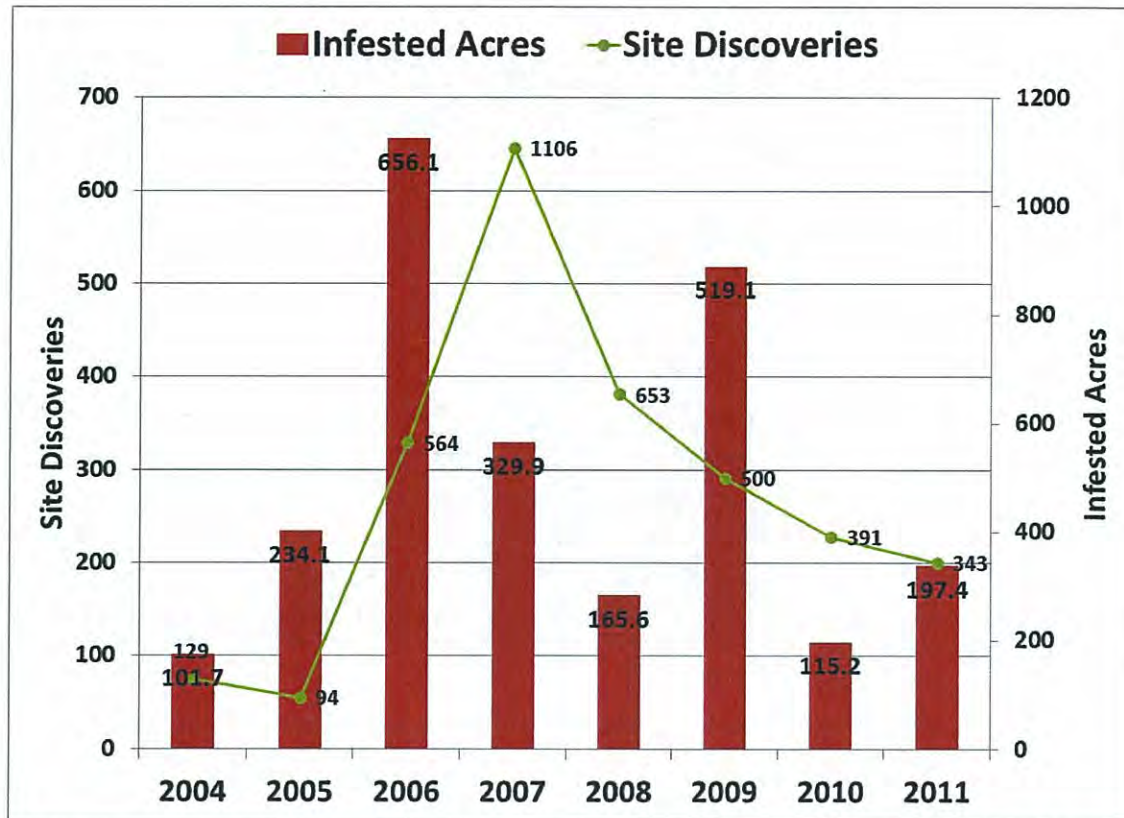


Figure 19. Number of new nonnative invasive species sites and number of total infested acres documented on Chequamegon-Nicolet National Forest during 2004-2011.

Treatment of infested sites can include herbicide application, mowing, hand-pulling, prescribed fire, and biocontrol. In 2011, a total of 493 sites amounting to 1,449 acres were treated (Table 14). The majority of treatments were herbicide applications; treatment areas ranged from less than 1 acre up to 78 acres.

Table 14. Number of nonnative invasive species infestations acres and sites treated by Ranger District on the Chequamegon-Nicolet National Forest since 2009.

	Treatment	MDPF	GD	ERFL	LKLA	WB	NGLVC	Forestwide
2009	Acres	383	300	241	287	302	4	1,517
	Sites	39	118	122	216	129	8	632
2010	Acres	138	371	262	404	753	3	1,931
	Sites	23	108	118	236	109	3	597
2011	Acres	61	83	318	315	672	0	1,449
	Sites	11	21	164	193	104	0	493

MPF - Medford-Park Falls, GD - Great Divide, ERFL - Eagle River-Florence, LKLA - Lakewood-Laona, WB - Washburn, NGLVC - Northern Great Lakes Visitor Center

Soil Resources

Objective 1.7: Provide desired physical, chemical and biological soil processes and functions on the Forest to maintain and/or improve soil productivity.

Soil quality monitoring is conducted annually by experienced soil scientists to ensure soil conservation practices and management prescriptions designed to maintain soil quality have been implemented and are effective. The intent is to determine if site-specific project design features maintained the soil resource in an acceptable condition. Effectiveness monitoring on the CNNF is primarily done through qualitative assessments (mostly ocular) using indicators and measurement techniques defined by the USDA-FS Eastern Region. Selected harvest units averaging about 25 acres in size are evaluated for detrimental soil conditions such as rutting, compaction or erosion that may result from heavy equipment used in harvest activities. The degree, extent and distribution of soil disturbance is documented and compared to the Regional soil quality standards. Additional quantitative monitoring may be conducted when qualitative assessments of management practices appear to have produced unacceptable results.

CNNF soil scientists also use the standardized Forest Soil Disturbance Monitoring Protocol developed by the Rocky Mountain Research Station and San Dimas Technology and Development Center which provides a statistically robust rapid assessment method for consistent monitoring of both pre and post-activity soil disturbance on National Forest System lands (Page-Dumreose et al. 2009a and b, Napper et al. 2009).

During fiscal year 2011 CNNF soil scientists monitored and recorded soil resource impacts from timber harvest activities on 21 harvest units, from 12 different timber sales, across all five Ranger Districts, on 14 different soil types. Eleven timber sale payment units were assessed qualitatively for soil disturbance by a complete walk-through with the sale administrator, and ten units were evaluated quantitatively by transecting the units using the standardized protocol, with both approaches assessing the degree and extent of soil compaction, rutting, displacement and erosion. Information and findings were documented for each harvest unit sampled, along with supportive digital photos. About 10% of each area was traveled on by timber harvesting equipment. Winter (frozen ground) harvests had the least amount of soil disturbance with less than 1% of the area detrimentally compacted, usually at the landings and on main skid trails. All season harvest during dry ground conditions left about 1-2% of the area detrimentally compacted at the landings and main skid trails, with no soil rutting. Harvest operations on a wet, loamy textured soil in one 33 acre payment unit resulted in about 3% detrimental rutting and compaction, as determined by the rapid assessment protocol method. No detrimental soil erosion, displacement or organic matter removal was observed on any of the monitored harvest units.

All harvest areas monitored were well below soil quality threshold values for detrimental soil disturbance from harvest activities and were in compliance with Regional soil quality standards and Forest Plan soil guidelines. Soil conservation practices, such as restricting harvest operations to dry or frozen ground by soil type, were successfully implemented on all areas monitored for FY 2011, and were effective in minimizing potential adverse impacts to the soil resource of the CNNF.

Recreation Opportunities

Objective 2.1d and 2.1e: Construct up to 85 miles of ATV trail on the Nicolet landbase and up to 100 miles of ATV trail on the Chequamegon landbase.

In 2008, the CNNF designated its network of roads and trails open to motorized travel in compliance with the Travel Management Rule. At that time, approximately 559 miles of road were made available to the public for ATV travel, 71 of those miles were on the Nicolet side of the CNNF. At that time, there were also approximately 334 miles of trails available for public ATV use; the vast majority of those miles were on the Chequamegon side of the forest. Since then, modest gains in the amount of ATV trail constructed on the CNNF have occurred. However, the amount of ATV-riding opportunities on roads designated for ATV use in addition to the highway-legal vehicle traffic has been more dynamic.

In 2011, on the Nicolet side of the CNNF, 0.1 mile of trail was constructed, and 1.4 miles of ATV trail were designated for ATV use. On the Chequamegon side of the Forest, there were no trails constructed and approximately 0.3 miles designated. In 2011, a total of 303.1 miles of designated ATV trail existed on the Chequamegon landbase of the CNNF and approximately 11.8 miles on the Nicolet landbase (Table 15).

Table 15. Miles of ATV trail created each year on the Chequamegon-Nicolet National Forest.

Landbase	2005	2006	2007	2008	2009	2010	2011	Total
Nicolet	0	0	1.7	0.5	7.4	0.6	1.5	11.8
Chequamegon	0	0	0	3	0.1	2.2	0.3	5.6

A total of 1.5 miles of trail were added to the 2011/2012 MVUM on the Nicolet side of the Forest. This mileage came from two different project decisions:

- Nicolet ATV Route and Trail Designations Decision (Oct 12, 2007); Eagle River-Florence Ranger District; 1.4 miles. This decision identified 4.7 miles of trail that could be added to the system but by the end of 2011, only 1.4 miles have been added.
- Bushafer Road to Nicolet State Trail Project (Sept. 14, 2009); Lakewood-Laona Ranger District; 0.1 miles. The decision was to connect Bushafer Road, a town road which allows ATV use, with the Nicolet State Trail, also open to ATVs.

On the Chequamegon landbase, a total of 0.31 miles of ATV trail were added to the 2011/2012 MVUM as a result of the 2011 TMR decision (July 27, 2011).

Objective 2.1i: Provide well-maintained developed campgrounds that meet USFS guidelines.

Forest Service guidelines call for developed campgrounds to be “managed to standard.” These standards are a baseline measure that helps define the corporate level of quality the Forest Service wants to provide the public at full service levels. In addition, the standards are used for estimating the total cost of providing quality opportunities for visitors. The “meaningful measures” management system provides a structure that identifies five recreation program components. Each component is comprised of several key measures; each key measure is a category made up of several standards (national quality standards); and each standard is defined by a set of work tasks.

The components used to determine if campgrounds are managed to standard are:

1. **Health and Cleanliness:** Healthy environment for users and employees. No threat of disease or infection. Environments should be odor and litter free.
2. **Setting:** Site development is consistent with recreation opportunity spectrum objectives and FLMP development scale. Resources are maintained or enhanced, scenery management is consistent with objectives, and density of users is appropriate
3. **Safety and Security:** Provide for a safe environment for users and employees. Uniformed Forest Service personnel are present. Abusive and nonconforming activities are controlled and risk of crime is eliminated.
4. **Responsiveness:** Experience meets visitor expectations, needs, and preferences. Information and interpretive services are available along with appropriate unique amenities with good hosting services.
5. **Condition of Facilities and Equipment:** They have an overall good appearance, function properly, are in good repair, and appropriate.

During fiscal year 2011, approximately 80 percent of all recreation sites met standards and 87 percent of all campgrounds met standard. Since 2004, more than 70 percent of the campgrounds annually have conformed to standards.

During the 2011 season, the Chippewa Campground on the Medford-Park Falls District was closed during the replacement of the water systems.

The Lost Lake Recreational Cabins on the Eagle River-Florence Ranger District were closed to the public in 2011 for major renovations. Constructed in 1938 by the Forest Service in cooperation with the Civilian Conservation Corps, the area was originally known as Lost Lake Organizational Camp. The camp is eligible for the National Register of Historic Places. In 2009 the Forest Service received funding through the American Recovery and Reinvestment Act for preservation and restoration. Restoration/reconstruction plans and specifications were based on the 2003 Lost Lake Organizational Camp Cultural Resource Preservation Plan, a plan reviewed and approved by the State Historic Preservation Officer (SHPO). Federal standards for historic properties were met and the camp continues eligible for the National Register of Historic Places. The camp reopened to the public in the spring of 2012.

Cultural Resources

The Chequamegon-Nicolet National Forest, through its administration of the Heritage Program, is charged with the responsibility of identifying, protecting, managing, and interpreting cultural resources; that is, significant archaeological sites and historically significant buildings, structures, objects and cultural modifications to the landscape. The forest plan's standards and guidelines reflect statutory direction provided in the National Historic Preservation Act (NHPA) of 1966, as amended.

Objective 2.4c: Conduct scientific studies to further our understanding of human adaptation and influences on the landscape.

Through American Recovery and Reinvestment Act funding, and in cooperation with the Chequamegon-Nicolet National Forest watershed staff, Heritage Program staff initiated a strategy for comprehensive inventory of historic dams and structures that were built within the Forest's riparian features. The goals of this work were:

- (1) to better understand the location and function of structures historically placed within riparian features
- (2) to better understand how these features affected the contemporary Forest landscape
- (3) to develop guidelines for removal of some of these features to enhance watershed restoration, while at the same time selecting others as historically important resources to preserve for future generations, and
- (4) to connect citizens to the land through development of an interpretive plan that will convey the importance of riparian restoration as well as the preservation of significant historic features.

Contract administration continued in 2011 on the Historic Dams and Streams Crossings contract and will continue into 2012 until the treatment plan is accomplished by the contractor.

In support of other areas of resource management, such as timber production, approximately 175,000 acres of cultural resource surveys took place between 2004 and 2010. These surveys, and those that occurred earlier, have resulted in the discovery of approximately 2,600 cultural resources within the Chequamegon-Nicolet National Forest. Further, by the end of 2011, approximately 20,303 acres or 1 percent of the Chequamegon-Nicolet National Forest landbase were examined for the presence of cultural resources. Contract administration which began in 2011 will continue into 2012.

Heritage Staff including the Forest Archaeologist, Archaeological Technician, and district Archaeological Paraprofessionals identified 6 new sites & monitored 46 sites in 2011. Three new sites were identified and 20 were monitored under contract. In August 2011, the Lake Owen Archaeological District, comprised of 13 Pre-European contact sites, was placed on the State Register of Historic Places and will likely be placed on the National Register in 2012.

Minerals and Energy Resources

Objective 2.6: Ensure that reclamation provision and environmental protections measures of operating plans and surface use plans of operations are completed to standard.

On the Chequamegon-Nicolet National Forest, the mineral materials database is used for issuing and monitoring permits for external use and internal use of sand and gravel resources. To ensure compliance with the Wisconsin Department of Natural Resources storm water permit for gravel pit operations, operating plans and permit stipulations along with inspections are required. In 2011, there were 11 internal and 18 external permits issued for cooperative road maintenance activity, timber sales, and recreation facility maintenance.

Pit management plans are written for each gravel pit to ensure adequate utilization of the resource, safety, and to mitigate impacts on surface resources. In 2011, two pit management plans were updated or completed to ensure efficient utilization of the resource and provide environmental protection. No final reclamation projects (maintaining internal drainage, sloping, tree planting, etc.) occurred in FY 2011.

One prospecting license was issued by the Bureau of Land Management (BLM) issued in 2011 for the Bend deposit and surrounding license area, but no actual prospecting activity (i.e. drill holes) occurred until the middle of January 2012.

Fire Management

Objective 2.8c: Reduce hazardous fuels within communities at risk, in cooperation with local, Federal, and State agencies.

A total of 2,483 acres of hazardous fuels reduction treatments occurred within the wildland-urban interface adjacent to communities at risk during 2011 (table 16). This objective is mandated through the National Fire Plan, the 10-Year Strategy and Implementation Plan, the Healthy Forests Initiative and Healthy Forests Restoration Act, and Cohesive Fuels Treatment Strategy, and continues to be supported through annual budget advice.

Hazardous fuels reduction treatments have been targeted within the wildland-urban interface of communities at risk and have prepared three community wildfire protection plans. Wildland-urban interface is abundant on the Chequamegon-Nicolet National Forest; the majority of fires to which the Forest responds are human-caused and originate on private lands. The Forest's fire suppression success rate is extremely high.

Table 16. Total acres treated within the wildland-urban interface to reduce hazardous fuels from 2005-2011

Year	Total acres treated
2005	2,360
2006	1,122
2007	1,590
2008	2,770
2009	3,930
2010	3,475
2011	2,483

CHAPTER 3

NATIONAL VISITOR USE MONITORING

Not all resource monitoring that occurred on the Chequamegon-Nicolet National Forest in 2011 are compelled by the direction of the 2004 Forest Plan. In this Chapter, some of the results of the National Visitor Use Monitoring program are highlighted.

In 2011, the Chequamegon Nicolet National Forest participated the USFS National Visitor Use Monitoring program which was designed to provide reliable information about recreation visitors to national forest system managed lands at the national, regional and forest scale. The data collected under this effort provides a characterization of the visitors that use the national forest, what activities draw them to the forest,

and how satisfied they are with these experiences. Overall, the overwhelming majority of visitors to the CNNF are from Wisconsin and most of the rest of the visitors are from a neighboring state (Figure 20). Over 60% of the visitors who visit the forest for more than one day stay at home or at the home of a friend and therefore do not meaningfully contribute to that sector of the tourist economy (Figure 21). Of the 578 respondents reporting their race/ethnicity, 557 (99%) reported that they are white and thirteen (1%) reported that they are American Indian/Alaskan Native. No other race/ethnicity had more than five respondents.



Figure 20. County of origin of the respondents to the 2011 NVUM surveys. Larger stickpins indicate a greater number of respondents from that county.

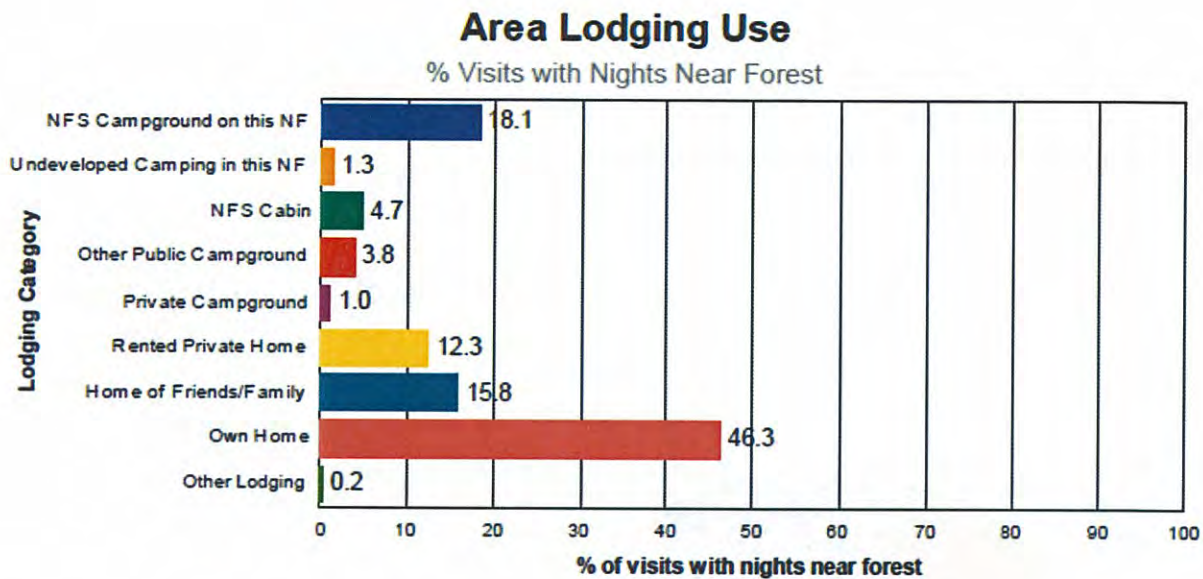


Figure 21. Lodging profile of survey respondents who indicated that they were spending one or more nights in or near the National Forest.

Hunting, snowmobiling, sightseeing, camping and fishing were the most popular activities reported by the survey respondents (Figure 22).

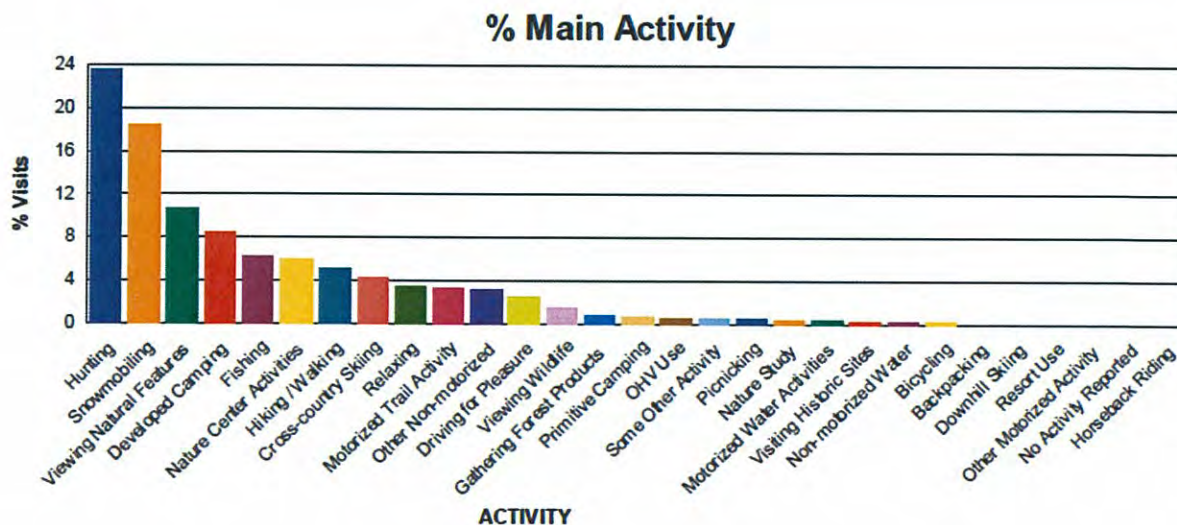


Figure 22. Popularity of recreational activities in 2011 National Visitor Use Monitoring surveys on the Chequamegon-Nicolet National Forest. Some respondents selected more than one activity as their main reason for visiting the Forest, so these columns may total more than 100%.

Overall satisfaction ratings of the recreational experience were high. Eighty-one percent of the respondents indicated that they were very satisfied and another 12 percent were somewhat satisfied. Only three percent indicated any level of dissatisfaction (Figure 23). For more information about the NVUM program and results, check out the national website at <http://www.fs.fed.us/recreation/programs/nvum/>.

Percent of National Forest Visits by Overall Satisfaction Rating

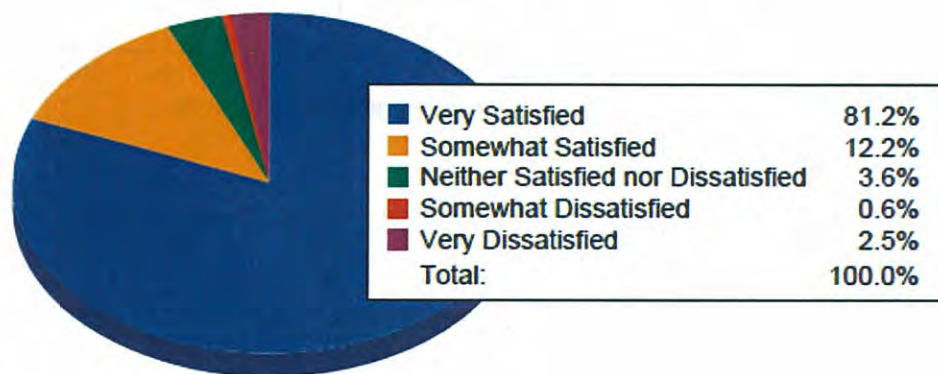


Figure 23. CNNF visitor satisfaction during 2011.

CHAPTER 4

CONCLUSIONS

Highlights

Fiscal Year 2011 on the Chequamegon-Nicolet National Forest did not present some of the unpredictable events which affected delivery of Forest programs in the past few years. Restocking of forested stands from which timber was harvested remained highly successful. Relative to the previous years, little blowdown or insect and disease outbreaks affecting National Forest lands occurred and salvage of wood products from events from previous years is largely complete. The actual outputs and services provided by the Forest remained well below those projected during development of the Forest Plan, but these deficits correspond to lower-than-projected funding levels.

Population trends of Federally-listed species, management indicator species, and Regional Forester Sensitive Species continued as expected and described in previous reports. Restoration of aquatic habitats, including lake habitats and road and trail stream crossings continued in 2011 at similar levels to the previous two years. Discoveries of infestations of invasive plant species continued to decline consistent with the trend since 2007. A similar amount of acres as in previous years, however, were treated to control non-native plant infestations in 2011.

Construction and designation of riding opportunities for All-Terrain Vehicles continued at a slow pace, consistent with cautious approach described in the Record of Decision for the 2004 Forest Plan. In 2011, the Forest participated in the National Visitor Use Monitoring program which documented that the majority of visitors to the Forest are from Wisconsin. They come to the Forest to hunt, snowmobile, sightsee, camp and fish and are very satisfied with their visit.

Recommendations

None of the results described in this report indicate that there are problems with the management direction provided in the 2004 Forest Plan. No significant Forest Plan amendments are recommended at this time.

REFERENCES

- Boal, C.S., D.E. Andersen, and P.L. Kennedy. 2001. Home range and habitat use of northern goshawks (*Accipiter gentilis*) in Minnesota. St. Paul, Minnesota: Minnesota Cooperative Fish and Wildlife Research Unit. 50 p.
- Bruggeman, J.E., D.E. Andersen, and J.E. Woodford. 2009. Northern goshawk monitoring in the western Great Lakes region. *Journal of Raptor Research* 45:290–303.
- Bushman, M. 2011. An analysis of the Washburn District FIREMON Data 2005-2010. Unpublished report, available from the Washburn Ranger District, Chequamegon-Nicolet National Forest. 39 p.
- Cordell, H.K., J. C. Bergstrom and J.M. Bowker. 2005. *The Multiple values of Wilderness*. State College, PA: Venture Publishing.
- Dhuey, B. 2011. Ruffed grouse drumming survey; 2011. WDNR Bureau of Science Services, Madison, WI. Available online at: <http://dnr.wi.gov/topic/WildlifeHabitat/documents/reports/finaldrum2.pdf>
- Eklund, D., L. Parker and J. Schmidt. 2008. Status of Kirtland Warbler Habitat on the CNNF; a summary. July 10, 2008. Unpublished report available from the Chequamegon-Nicolet National Forest. Rhinelander, WI. 14 p.
- Eckstein, R., Dahl, G., Easterly, S., Ishmael, B., Nelson, J., Manthey, P., Meyer, M., Tesky, L., Goltz, D., Glenzinski, B. 2009. Wisconsin Bald Eagle and Osprey Surveys; 2009. Wisconsin Department of Natural Resources. 8 p. Available online at: <http://dnr.wi.gov/org/land/wildlife/harvest/reports/eagleospreysurv.pdf> (last accessed: 2010-AUG-19).
- Jacobs, J. 2011. Summary of Red-Shouldered Hawk Reproduction; Nicolet National Forest 2011. Unpublished report to Chequamegon-Nicolet National Forest. 5pp.
- Kennedy, P.L. and D.E. Andersen. 2006. Research and Monitoring Plan for the northern goshawks (*Accipiter gentilis atricapillus*) in the Western Great Lakes Region. Minnesota Cooperative Fish and Wildlife Research Unit St. Paul, Minnesota. 83 p.
- Napper, C.; Howes, S.; Page-Dumroese, D. 2009. Soil-disturbance field guide.0819 1815-SDTDC. San Dimas, CA: San Dimas Technology Center
- Page-Dumroese, D.; Abbott, A.M., Rice; T.M. 2009a. Forest soil disturbance monitoring protocol, volume 1 – rapid assessment. FS-WO-82a. Moscow, ID: USDA, FS, Rocky Mountain Research Station, 29 p.
- Page-Dumroese, D.; Abbott, A.M.; Rice, T.M. 2009b. Forest soil disturbance monitoring protocol, volume 2 – supplementary methods, statistics, and data collection. FS-WO-82b. Moscow, ID: USDA Forest Service Rocky Mountain Research Station, 64 p.

- Perry, C.H. 2012. Wisconsin's forest resources, 2011. Research Note NRS-136. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 4p.
- Perry, Charles H. (Hobie); Everson, Vern A.; Brown, Ian K.; Cummings-Carlson, Jane; Dahir, Sally E.; Jepsen, Edward A.; Kovach, Joe; Labissoniere, Michael D.; Mace, Terry R.; Padley, Eunice A.; Rideout, Richard B.; Butler, Brett J.; Crocker, Susan J.; Liknes, Greg C.; Morin, Randall S.; Nelson, Mark D.; Wilson, Barry T. (Ty); Woodall, Christopher W. 2008. Wisconsin's forests, 2004. Resource Bull. NRS-23. Newtown Square, PA: USDA Forest Service, Northern Research Station. 104 p.
- Posner, S. and L. Hildebrandt. 2006. Variations in Vegetation Composition and Cover Related to Prescribed Burning In the Moquah Barrens. USDA. Forest Service. 20 p.
- Quinn, B. and V. Lopez. 2006a. *An assessment of mature northern hardwood interior forest on the Chequamegon-Nicolet National Forest*. USDA Forest Service. Unpublished report. 24 p.
- Quinn, B. and V. Lopez. 2006b. *An assessment of mature, natural red & white pine management indicator habitat on the Chequamegon-Nicolet National Forest*. Unpublished report available from the Chequamegon-Nicolet National Forest, Park Falls, WI. 11 p.
- Quinn, B. and J. Schmidt. 2007. *An assessment of regenerating aspen management indicator habitat on the Chequamegon-Nicolet National Forest*. Unpublished report available from the Chequamegon-Nicolet National Forest, Park Falls, WI. 14 p.
- Robbins, S.D. 1991. *Wisconsin Birdlife: Population & Distribution Past and Present*. The University of Wisconsin Press. 702 p.
- USDA Forest Service. 2004a. Chequamegon-Nicolet Land and Resource Management Plan. Chequamegon-Nicolet National Forest. Milwaukee, WI.
- USDA Forest Service. 2004b. Record of Decision for the Final Environmental Impact Statement to Accompany the 2004 Land and Resource Management Plan. Chequamegon-Nicolet National Forest. Milwaukee, WI.
- USDA Forest Service. 2004c. Final Environmental Impact Statement to Accompany the 2004 Land and Resource Management Plan. Chequamegon-Nicolet National Forest. Milwaukee, WI.
- USDA Forest Service. 2010. Environmental Assessment for the Kirtland's Warbler Habitat Improvement Project. Chequamegon-Nicolet National Forest. Rhinelander, WI. 52 p.
- USDI Fish and Wildlife Service. 1983. Northern States Bald Eagle Recovery Plan. Denver, CO. 131 p. Available online at:
http://www.fws.gov/midwest/eagle/recovery/be_n_recplan.pdf
- USDI Fish and Wildlife Service. 1991. Fassett's Locoweed Recovery Plan. Twin Cities, MN. 51 p. Available online at:
http://ecos.fws.gov/docs/recovery_plans/1991/910329.pdf

- USDI Fish and Wildlife Service. 1992. Recovery Plan for the Eastern Timber Wolf. Twin Cities, MN. 73 p.
- WDNR (Wisconsin Department of Natural Resources). 1986. Wisconsin Department of Natural Resources Bald Eagle Recovery Plan. WDNR Bureau of Endangered Resources, Madison, WI. 44 p.
- WDNR (Wisconsin Department of Natural Resources). 1999. 1999 Wisconsin Wolf Management Plan. Publ-ER-099. Madison, WI. 75 p. Online at:
<http://dnr.wi.gov/org/land/er/publications/wolfplan/toc.htm>
- WDNR. 2010b. Wisconsin Bald Eagle and Osprey Surveys, 2010. Available online at:
<http://dnr.wi.gov/org/land/wildlife/harvest/reports/eagleospreysurv2.pdf> [last accessed 2011-SEPT-27.]
- Woodford, J.E., C.A. Elorant, and A. Rinaldi. 2008. "Nest density, productivity, and habitat selection of red-shouldered hawks in a contiguous forest." *J. Raptor Res.* 42(2):79-86
- Wydeven, A.P. J.E. Wiedenhoef, R.N. Schultz, J.E. Bruner, R.R. Thiel, S.R. Boles and M.A. Windsor. 2011. Wisconsin endangered resources report #140. Status of the timber wolf in Wisconsin. Performance report: 1 July 2010 through 30 June 2011 (also progress reports for 15 April 2010-14 April 2011, and 2010 summaries). WDNR Bureau of Endangered Resources, Madison, WI. 66pp.

