



United States
Department of
Agriculture

Forest Service
Eastern Region



June 2009

Ottawa National Forest

Fiscal Year 2008 Monitoring and Evaluation Report



O·T·T·A·W·A
NATIONAL FOREST

Caring for the Land and Serving People

Citation:

USDA Forest Service. 2009. Ottawa National Forest Fiscal Year 2008 Monitoring & Evaluation Report. Ironwood, MI.

Short name for citations in documents produced on the Forest – FY 08 M&E Report

Responsible Official:
Kent Connaughton, Regional Forester
USDA Forest Service
Eastern Region
626 E. Wisconsin Avenue
Milwaukee, WI 53202

For further information contact:

Ottawa National Forest
E6248 US Highway 2
Ironwood, MI 49938
Phone: 906-932-1330
Fax: 906-932-0122
TTY: 906-932-0301

FY 2008 MONITORING AND EVALUATION REPORT

TABLE OF CONTENTS

Introduction and Forest Plan Overview	1
Purpose and Scope of the Report	2
Previous Monitoring	2
Monitoring Program.....	2
Monitoring Activities for FY 2008.....	3
Comparison of Projected and Actual Outputs and Services	5
Insect and Disease Population Levels.....	7
Current Infestations.....	7
Potential Threats	9
Effects of Off-Highway Vehicle (OHV).....	10
Effectiveness of Managing Off-Highway Vehicle Use	11
Effectiveness of Road and Trail Closures.....	11
Harvested Lands Adequately Restocked	11
Land Management Effects on Land Productivity	12
Management Indicator Species (MIS)	13
Mayfly, Stonefly, Caddisfly.....	13
Ruffed Grouse	15
American Marten	17
Cutleaf Toothwort.....	19
Non-Native Invasive Species.....	20
Plants.....	20
Animals.....	22
Tribal Rights and Interests	23
Species of Viability Concern	23
Plants.....	23
Trumpeter Swan.....	24
Conservation of Threatened and Endangered Species (TES).....	27
Canada Lynx	27
Gray Wolf	28
<i>Kirtland's Warbler</i>	30
Remote Habitat Area (RHA) Road Density.....	34
Off-Highway Vehicle Impacts to Wildlife	35
Minerals and Mineral Materials.....	36
Land Adjustment.....	39
Fire Suppression.....	39
Effectiveness of Road Closure Devices	40
Findings.....	40
Future Monitoring Needs	41
Literature Cited	42
Appendix 1 – Schedule for Forest Plan Monitoring and Evaluation	43

TABLES

Table 1. Monitoring activities for FY 2008.	3
Table 2. FY 2008 actual volume sold by product type.	6
Table 3. FY 2008 actual volume harvested by product type.....	6
Table 4. FY 2008 and first decade actual harvest acres compared to the Forest Plan’s estimated average annual timber harvest practices.	6
Table 5. Acres of insect and disease agents on the Ottawa National Forest, FY 2008.	7
Table 6. Summary table of results from EPT surveys, by 300’ stream reach.	14
Table 7. Number of Marten Registered in the Western U.P. 2000-2007.	18
Table 8. Efforts to eradicate non-native invasive plants across the Ottawa, 2008.....	21
Table 9. Trumpeter swans found on the Ottawa National Forest, 2003-2008.	26
Table 10. Gray wolf population estimates and number of wolf packs occurring on or near the Ottawa National Forest in 2008, by county ¹	30
Table 11. Acres of suitable and unsuitable (based on current stand ages) Kirtland’s warbler habitat on the Ottawa, 2008.	31
Table 12. Singing male Kirtland’s warblers detected in Michigan, 1993-2008.	34
Table 13. Road Density (open to passenger vehicles) in Remote Habitat Area.	35
Table 14. OHV trail and road mileages, Ottawa National Forest, 2006-2008.....	36
Table 15. Summary of FY 2008 Wildland Fires Reported by the Ottawa.....	39

FIGURES

Figure 1 Vicinity Map.....	1
Figure 2 Map of 2008 aerial pest detection flight.....	8
Figure 3 Acres of aspen forest types by 10-year age classes, Ottawa, 2008	16
Figure 4 Location of Ruffed Grouse Monitoring Routes, Ottawa, 2008	17
Figure 5 Locations of marten on or within one mile of the Ottawa National Forest Proclamation Boundary	19
Figure 6 Gray wolf population and number of packs in Michigan's Upper Peninsula, 2000- 2008 (data from MDNR)	29
Figure 7 Map of northeast corner of Ottawa showing areas of jack pine concentration and potential Kirtland's warbler habitat areas.....	33
Figure 8 Locations of requests for federal and private mineral exploration permits	38

Introduction and Forest Plan Overview

The Ottawa National Forest (Ottawa) encompasses about one million acres within the western end of Michigan's Upper Peninsula within six counties: Baraga, Gogebic, Houghton, Iron, Marquette and Ontonagon. The Ottawa land base lies in the transition between the northern boreal forests and eastern deciduous forests. The Ottawa provides a great diversity of species, both flora and fauna, and a wide variety of recreation opportunities.



Figure 1 Vicinity Map

In March 2006, the Ottawa 2006 Land and Resource Management Plan (Forest Plan) was approved, replacing the 1986 Forest Plan. The Forest Plan provides guidance for all resource management activities on the Ottawa. It establishes: forest-wide multiple use goals; implementation objectives standards and guidelines; and Management Area (MA) direction, including area specific standards and guidelines, desired conditions, as well as monitoring and evaluation requirements.

To determine the efficacy of a Forest Plan, the National Forest Management Act (NFMA) regulations (36 CFR 219) require regularly scheduled monitoring and evaluation.

The Forest Plan provides broad, strategic, landscape-level direction for managing the Ottawa. Through implementation of the Forest Plan, the Ottawa will work toward desired conditions. This includes providing a variety of resource uses, recreational opportunities and services to the public, while ensuring protection of soil, water, cultural resources, as well as native and desired non-native plants and animals. Achieving goals and objectives of the Forest Plan will be accomplished through project decisions that meet the requirements of the National Environmental Policy Act (NEPA) as well as other laws and regulations.

The National Forest Land and Resource Management Planning Regulations permit amendments to the Forest Plan that may result in either significant or non-significant changes (36 CFR 219.10 (e)(f)). The 2006 Forest Plan has been amended to incorporate the development of a Wild and Scenic River Comprehensive River Management Plan for all rivers designated through the Michigan Scenic Rivers Act of 1991. This amendment was issued on July 13, 2007.

Purpose and Scope of the Report

The purpose of this Monitoring and Evaluation (M&E) Report is to determine and disclose whether resource management activities conducted on the Ottawa are meeting management direction and multiple use objectives described in the Forest Plan. Monitoring tasks are scaled to the Forest Plan, program or project. Monitoring is not performed on every single activity, nor is it expected to meet the statistical rigor of formal research. If budget levels limit the Ottawa's ability to perform all monitoring tasks, then those specifically required by law are given highest priority.

The Ottawa is in the early stages of implementing the 2006 Forest Plan. Therefore, some types of monitoring reported in this document are primarily implementation monitoring. It is important to first ensure that the Ottawa is properly following the objectives, standards and guidelines established in the Forest Plan. Other types of monitoring will play a larger role in the following years when the effectiveness of Forest Plan implementation will be more apparent. For example, on-the-ground changes to forest type composition, age structure, and other attributes within MAs have been minimal during the early stages of Forest Plan implementation, so our monitoring is limited to implementation monitoring at this time. Changes in these parameters will be reviewed for effectiveness in subsequent years.

Previous Monitoring

Chapter 4 of the 2006 Forest Plan provides programmatic direction for monitoring and evaluating implementation. Monitoring and evaluation are separate activities. Monitoring is the process of collecting data and information. Evaluation is the analysis and interpretation of the information and data collected.

The 2006 M&E Report was limited in its scope because it was a partial year of Forest Plan implementation, although monitoring data was collected for the entire year. A more complete report was developed for the 2007 M&E Report. Few monitoring items were evaluated for effectiveness or trends in the 2007 M&E Report, as the number of years of data were insufficient at that point to make comprehensive statements about most topics. For the same reasons, few monitoring items are evaluated in this 2008 M&E Report.

Monitoring Program

The aim of monitoring is to have the ability to respond to changing conditions, to make appropriate changes based on new information or technology, and to test the effectiveness of the direction in the Forest Plan. Monitoring determines the effects of different resource management activities and the degree to which desired conditions and objectives are being achieved through on-the-ground management. Through this process, the quality of project implementation is assessed; addressing physical, biological, social, and cultural elements along with any emerging issues. Ultimately, this process allows for appropriate adjustments to the Forest Plan, or the way the Forest Plan is implemented, to address unanticipated changes in conditions.

The Ottawa developed a Monitoring Guide from the monitoring questions described in Chapter 4 of the Forest Plan. This Guide outlines the monitoring questions or tasks; the type of monitoring category; which staff are responsible for each question; and the monitoring methods, protocols and requirements that will be used to measure the monitoring items. The Monitoring Guide is available on the Ottawa's internet site: (<http://www.fs.fed.us/r9/ottawa/publications/docs/index.html>).

Using the Monitoring Guide, the FY 2008 Monitoring Work Plan was developed through an interdisciplinary review of the monitoring questions and guidance from Chapter 4 of the Forest Plan. The review included a prioritization of monitoring items using criteria, such as requirement by law or regulation, ecological importance, management importance or response to a key issue. From this review, a subset of the entire Monitoring Guide was chosen for monitoring work to be completed in 2008; therefore the identification (ID) number shown in Table 1 is not sequential.

Monitoring Activities for FY 2008

Table 1 displays the monitoring activities that were completed for FY 2008. Appendix 1 of this document contains a schedule, by year, of all the Monitoring Items that are required to be reported on. Appendix 1 is intended to be a useful guide to determine when a Monitoring Item was last discussed in an M&E Report, and similarly, when a Monitoring Item is scheduled to be reported on again in the future.

Table 1. Monitoring activities for FY 2008.

Monitoring Item ID	Monitoring Question	Responsibility
01	How do actual outputs and services compare to those outputs and services projected in the 2006 Forest Plan?	Supervisory Forester
04	Are insect and disease population levels compatible with objectives for restoring or maintaining healthy forest conditions?	Supervisory Forester
05a	What are the effects of off-highway vehicles (OHVs) on the physical and social environment?	Recreation Coordinator and Forest Engineer
05b	How effective are forest management practices in managing OHV use?	Recreation Coordinator and Forest Engineer
05c	To what extent are road and trail closures effective in prohibiting unauthorized motor vehicle use?	Recreation Coordinator and Forest Engineer
06	Are harvested lands adequately restocked after 5 years?	Supervisory Forester
09	Are the effects of Forest management, including prescriptions, resulting in significant changes to productivity of the land?	Soil Scientist and Supervisory Forester

Monitoring Item ID	Monitoring Question	Responsibility
10a	To what extent are Forest management activities providing habitat for Management Indicator Species (EPT)?	Aquatic Biologist
10b	To what extent are Forest management activities providing habitat for Management Indicator Species (ruffed grouse)?	Wildlife Biologist
10c	To what extent are Forest management activities providing habitat for Management Indicator Species (American marten)?	Wildlife Biologist
10d	To what extent are Forest management activities providing habitat for Management Indicator Species (cutleaf toothwort)?	Botanist
12a	To what extent is Forest management contributing or responding to non-native invasive plant species?	Botanist
12b	To what extent is Forest management contributing or responding to non-native invasive animal species?	Aquatic Biologist and Fish Biologist
17	Is implementation of the 2006 Forest Plan compatible with tribal treaty rights with respect to the tribal Memorandum of Understanding?	Tribal Liaison
34a	To what extent is Forest management contributing or responding to the conservation of species of viability concern (such as Regional Forester Sensitive Species) and moving toward desired habitat conditions for these species?	Botanist
34d	To what extent is Forest management contributing or responding to the conservation of species of viability concern (such as Regional Foresters Sensitive Species) and moving toward desired habitat conditions for these species? (Trumpeter Swan)	Wildlife Biologist
35	To what extent is Forest management contributing to the conservation of threatened and endangered species and moving toward desired habitat conditions and populations trends for these species?	Wildlife Biologist
36	To what extent is Forest management affecting the density of open roads within the Remote Habitat Area, and moving toward the Forest density objective of < 1.0 miles/square mile?	Wildlife Biologist
38	To what extent are OHVs producing impacts to wildlife or wildlife habitats?	Wildlife Biologist and Recreation Coordinator

Monitoring Item ID	Monitoring Question	Responsibility
39	To what extent is the Forest providing minerals and mineral materials to help support economic growth?	Lands/Minerals Program Manager and Geologist
40	To what extent has land ownership adjustment facilitated Forest management activities?	Lands/Minerals Program Manager
43	How have fire suppression tactics been implemented on the Forest relative to the threat posed to human life, property, or threatened resources?	Fire Management Officer
44b	To what extent are road closures on decommissioned roads effective in prohibiting unauthorized motor vehicle use?	Engineering/Facilities Program Manager

Comparison of Projected and Actual Outputs and Services

The active management of the renewable timber resource not only provides raw materials for industry that in turn generates finished goods, jobs, and strengthens the economy, but also fulfills a wide range of resource objectives aimed at achieving forest-wide goals identified in the Forest Plan.

The 2006 Forest Plan determined that 488,100 acres of land are suitable for timber production, and set the allowable sale quantity (ASQ) at 14.6 million cubic feet (MMCF) or 90.1 million board feet (MMBF) for the first decade (2006 Forest Plan, Appendix E, p. E-1). The ASQ is the quantity of timber that may be sold from the area of suitable land covered by the Forest Plan for a specified time period, usually expressed as the average annual allowable sale quantity. The amount of timber that may be sold in a single year may exceed the average annual ASQ as long as the decadal total ASQ is not exceeded each decade.

The volume sold and harvested was obtained from the Timber Cut and Sold Report. This information is tracked in the Automated Timber Sale Accounting (ATSA) and Timber Information Management (TIM) Systems. The amount of timber volume the Ottawa can offer in any given year depends on the Forest's budget and priorities, and the amount of volume authorized through a decision based upon NEPA (National Environmental Policy Act) analysis and public involvement.

The average volume sold over the last three years is approximately 7.3 MMCF (or 45.9 MMBF), which is about 51% of the average annual ASQ. The volume sold in 2008 is slightly below the three year average as shown in Table 2. Reduced budgets have been largely responsible for the lower volume sold.

Volume harvested depends on the number of sales and amount of volume under contract, the capability of the operators, market conditions, and operating conditions. The volume harvested in 2008 has increased to about 5,108 acres (39.1 MMBF or 6.3 MMCF; see Tables

3 and 4), which is about one percent of the acreage determined suitable for active timber production in the Forest Plan.

Table 2. FY 2008 actual volume sold by product type.

Fiscal Year	Volume Sold					
	Sawtimber		Pulpwood		Total	
	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF
2006	10.0	1.8	51.6	8.1	61.6	9.9
2007	4.7	0.8	32.5	5.1	37.2	5.9
2008	4.8	0.9	34.2	5.3	39.0	6.2
Average	6.5	1.2	39.4	6.2	45.9	7.3

Good markets and better winter operating conditions were largely responsible for the increased harvest in 2008. This is about the same amount of acres that were harvested in 2007, slightly above the three year average, and equal to about 39% of the acres estimated in the Forest Plan (see Table 3). The three year average volume harvested is less than the three year average volume sold.

Table 3. FY 2008 actual volume harvested by product type.

Fiscal Year	Volume Harvested					
	Sawtimber		Pulpwood		Total	
	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF
2006	4.8	0.9	29.4	4.6	34.2	5.5
2007	5.7	1.0	29.2	4.2	34.9	5.2
2008	5.1	0.9	34.0	5.3	39.1	6.3
Average	5.2	0.9	30.9	4.7	36.1	5.7

Table 4. FY 2008 and first decade actual harvest acres compared to the Forest Plan's estimated average annual timber harvest practices.

Cutting Method	Forest Plan Estimate Acres	FY 2006 Acres	FY 2007 Acres	FY 2008 Acres	FY 06 - 08 Average Harvest Acres	FY06 - 08 Avg. % of Forest Plan Estimate
Selection	6,700	2,284	3,024	2,190	2,499	37
Thinning	3,100	1,265	1,318	1,506	1,363	44
Shelterwood	400	11	249	120	127	32
Clearcutting	1,900	307	516	1,292	705	37
Totals	12,100	3,867	5,107	5,108	4,694	39

Insect and Disease Population Levels

The Ottawa annually monitors the location and severity of insect and disease population levels on the Forest to ensure that insect and disease populations are compatible with objectives for restoring or maintaining healthy forest conditions. One of the biggest threats to forest health currently is exotic forest pests.

Current Infestations

Aerial pest detection flight surveys are an effective way to accomplish insect and disease monitoring. The Northern Research Station conducts annual flights over the Eastern Region of the U.S. Forest Service to determine the extent of the insect and disease population levels. A trained observer views the forest from the air and documents any patterns of mortality or defoliation and delineates these areas onto a map. Attributes, such as host, damage agent, symptom, and an estimate of intensity or number of trees affected, may also be recorded. The areas are then ground-truthed to ensure that the information is reliable. The Ottawa then monitors these areas and takes appropriate control actions if necessary.

Approximately 30,000 acres were defoliated on the Ottawa National Forest in 2008 by the gypsy moth, jack pine budworm and spruce budworm. Table 5 displays the number of acres affected, and Figure 2 indicates the location of the infestations found during the 2008 flight.

Table 5. Acres of insect and disease agents on the Ottawa National Forest, FY 2008.

Damage Agent	Damage	Severity	Host Name	Acres
Gypsy Moth	Defoliation	High	Aspen / Red Oak	26,400
Gypsy Moth	Defoliation	Low	Aspen / Red Oak	700
Jack Pine Budworm	Defoliation	Low	Jack Pine	140
Spruce Budworm	Defoliation	High	Spruce / Fir	2,300
Spruce Budworm	Defoliation	Low	Spruce / Fir	400
Ips Bark Beetle	Mortality	High	Red Pine	140

Gypsy moth is an exotic insect from Asia and Europe. Gypsy moth defoliated about 27,000 acres of hardwoods, mainly aspen, on the Ottawa in 2008. Most of the activity was in the Norwich area, south of Ontonagon. There have been small numbers of gypsy moth in the area for years. The population greatly expanded in 2007 and has increased again in 2008. From the high number of gypsy moth egg masses present, the 2009 gypsy moth population numbers could also be high. Oftentimes gypsy moth outbreaks in aspen stands are very intense, but usually the outbreaks are short-lived, and aspen will rebound and grow back their foliage the following year. The gypsy moth population will be monitored closely again in 2009.

Jack pine budworm is a native species that defoliated jack pine trees on 140 acres in 2008, down substantially from 19,000 acres in 2007. The only recent jack pine budworm defoliation observed from the 2008 flight was in the Baraga Plains area. Jack pine salvage sales are currently being implemented on the Watersmeet Ranger District just north of Land O' Lakes, Wisconsin. Several years of budworm defoliation in that area killed many jack pine trees.

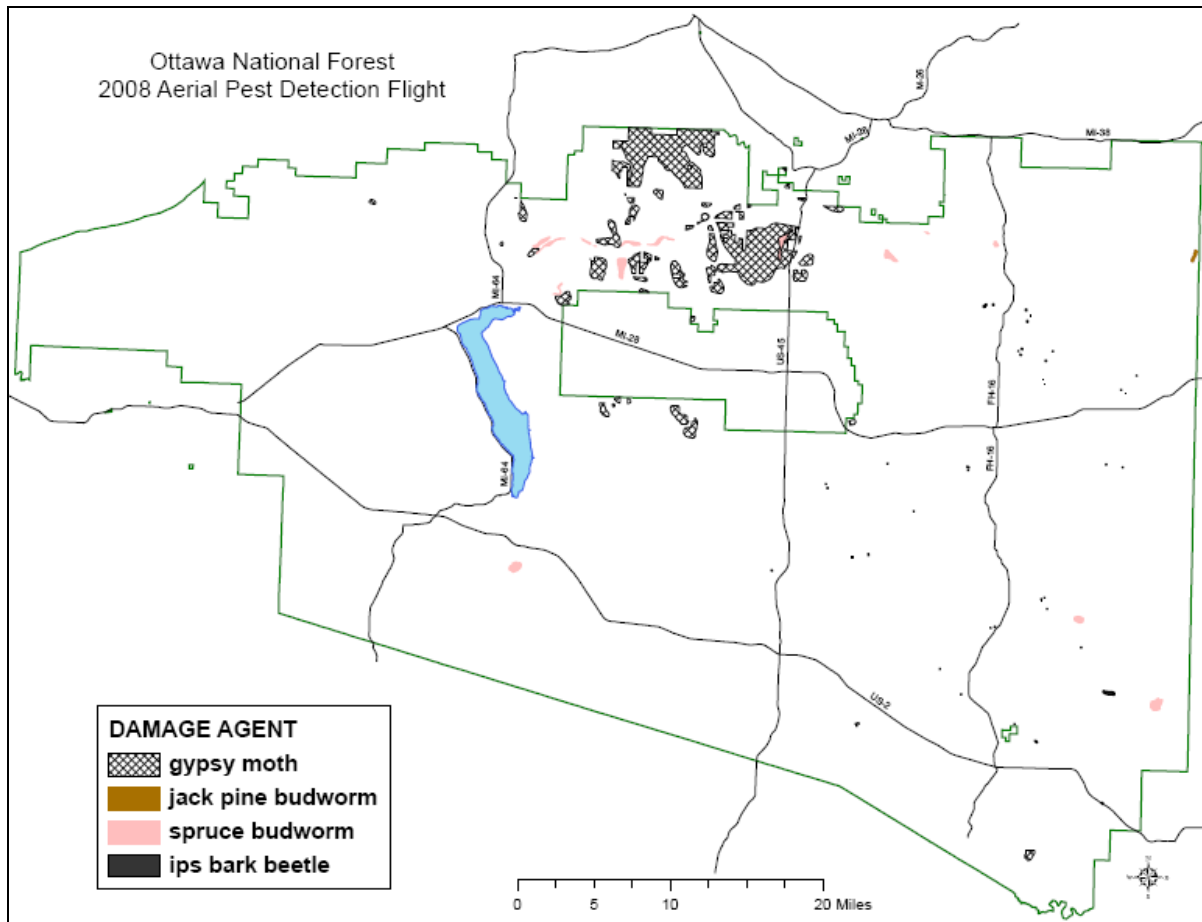


Figure 2 Map of 2008 aerial pest detection flight

Spruce budworm is a native species that caused defoliation of white spruce and balsam fir on about 3,000 acres across the Forest in 2008, down substantially from over 15,000 acres in 2007. Most of the larger trees can survive one year of spruce budworm defoliation provided the same areas are not repeatedly attacked in following years, and other agents do not also attack the trees. Some spruce plantations across the Forest are in declining health from spruce decline, which is caused by a combination of factors including spruce budworm, needlecast fungi, drought stress, root disease, and marginal site conditions. The Ottawa is currently performing a forest-wide inventory and assessment to determine the condition of the spruce forest type.

The largest blocks of spruce budworm defoliation occurred on the Bergland Ranger District in the Ridge Vegetation Management Project (VMP) area, where some of those defoliated stands have been proposed for treatments. Significant mortality also occurred in the Mud Lake VMP area on the Iron River Ranger District. Many of these unhealthy spruce stands in the Mud Lake project area will be harvested and converted to aspen stands.

Red pine mortality caused by the ips bark beetle was found on approximately 140 acres in 2008. The areas are usually less than an acre in size, and mostly scattered throughout the eastern one-third of the Ottawa. Ips generally attacks trees that are damaged, or are stressed because of drought conditions and overcrowding. Usually the ips bark beetle is not as serious of a pest in the east as it is in the west, where they can kill entire landscapes of pine trees. The Forest will continue to monitor these ips populations over the next year.

Potential Threats

Emerald Ash Borer (EAB): The EAB is an exotic pest from Asia that has killed millions of ash trees in Michigan, Ohio, Indiana, Illinois, Pennsylvania, Maryland, Missouri, Pennsylvania, Virginia, Wisconsin, and Ontario and Quebec Canada.

The EAB is commonly spread through the movement of infected firewood from infected sites. Since 2004, a closure order has been in effect on the Ottawa, which restricts the movement of firewood from all EAB infected areas. In efforts to further reduce the chance of EAB spread, a new order was placed in October 2007. This order includes restricting the movement of firewood onto the Ottawa from known infected areas on the eastern end of the Upper Peninsula (U.P.) of Michigan, the newly discovered EAB infestation near Laurium in Houghton County as well as anywhere outside the U.P.

The Forest Service has cooperative agreements with the Michigan Department of Agriculture (MDA) and Michigan Technological University (MTU) to monitor for the EAB insect in Michigan. Trap trees (e.g., girdled ash) are located strategically across the state to attract and trap the insects to determine if they are present, so that control measures can be started before populations increase to uncontrollable levels. No EAB have been found on the Ottawa since the surveys began in 2004.

Crews from MTU established trap trees and purple paper traps baited with minuka oil on the Ottawa in 2008. Trap trees and purple traps were placed in areas where the spread would most likely occur, such as adjacent to campgrounds, picnic areas, and other recreation sites. In addition, MDA established trap trees randomly across the Ottawa, mainly along roads, at a density of approximately nine trap trees per township. No EAB were detected in any of the traps.

Sirex Woodwasp: This exotic insect is from Europe, Asia and North Africa that was first detected in New York in 2004. The woodwasp has also been found in northern Pennsylvania, southern Ontario, and in the Lower Peninsula of Michigan. The woodwasp larvae kill jack pine, red pine, and scotch pine trees.

Michigan Technological University, in a cooperative agreement with Animal and Plant Health Inspection Service (APHIS), MDA, the Michigan Department of Natural Resources (MDNR) and the Forest Service, placed funnel traps in 2007 and again in 2008 on the Ottawa to detect the presence of the sirex woodwasp. No woodwasps have been detected on the Ottawa or anywhere in the U.P. of Michigan.

Current insect and disease levels on the Ottawa are compatible with restoring and maintaining healthy forest conditions. The Ottawa strives to maintain healthy forest conditions through the use of silvicultural practices and integrated pest management techniques as described in the Forest Plan (p. 2-35).

Effects of Off-Highway Vehicle (OHV)

Use of OHVs on the Ottawa is allowed only on designated road routes and trails per the Travel Management Rule regulations (36 CFR 261.13) and the Forest Plan. Designated routes and trails are identified on the Ottawa's Motorized Vehicle Use Map (MVUM), which is published annually. The first MVUM was published in 2007 and subsequently updated for 2008.

Physical Environment: During the publication of the first MVUM in 2007, Operational Maintenance Level (OML) 1 roads (identified as trails on MVUM) and OML 2 roads were identified as open to OHVs providing that use did not lead to resource damage. Roads and trails with resource concerns, such as wet areas or the potential of sedimentation to stream channels were not on the MVUM (i.e., not open for travel).

The 2007 MVUM had approximately 1,710 miles of trail (OML1 roads) and 640 miles of OML2 road routes open for OHV travel. The 2008 MVUM designated about 1700 miles of trails (OML 1 roads), which is about 10 fewer miles of trail than the 2007 MVUM. In addition, about 635 miles of OML 2 roads were available for OHV use. The minor reduction in trail and road miles was a result of resource concerns (failing culverts, poor drainage, etc.) discovered through field visits after publication of the 2007 MVUM.

Social Environment: During the public comment period for the 2006 Forest Plan revision, the public expressed concern that restrictions on OHV use were discriminatory to older individuals and violated the Americans with Disabilities Act. Public comments were also sought prior to the production of the 2007 and 2008 MVUM. The public expressed concern over losing motorized access to traditional hunting areas, and once again voiced concern of discrimination against older Americans and people with disabilities.

Travel management restrictions implemented on the Ottawa apply equally to all individuals and thus do not violate the Americans with Disabilities Act. Monitoring during the 2007 and 2008 deer hunting seasons found that, in general, the public did change one of their hunting patterns, that being location of their camps. Contacts made during the deer hunting seasons indicated hunters were walking further to access traditional hunting sites. Although definitive numbers are not available, monitoring during the 2008 hunting season seemed to indicate that the number of deer hunters on the Ottawa were down from previous years. It is difficult to determine if this was due to the Forest's travel management restrictions, unemployment rates, a spike in fuel prices, or other factors.

In January of 2008, the Ottawa began efforts to identify two north/south connector routes between the established State of Michigan-designated OHV trails, while also identifying local, OHV connector routes access between communities scattered across the Forest. The

NEPA analysis for this project was not completed in 2008; and therefore the 2008 MVUM was not updated to reflect these routes.

Effectiveness of Managing Off-Highway Vehicle Use

Historic and traditional OHV use on the Ottawa allowed for cross-country OHV travel. The 2006 Forest Plan eliminated cross-country use and restricts OHV travel to designated trails and roads. Beginning in 2007 and continuing in 2008, the Forest chose to inform the public of the travel management restrictions instead of issuing citations for violation of illegal OHV use. Informational efforts included public media announcements, public meetings, signing roads and trails, and making public contact during high recreational use periods, specifically during the deer hunting seasons. These efforts, in addition to the publication and availability of the MVUM in 2007 and 2008, have led to an increased public awareness about the Ottawa's travel management restrictions.

Implementation of resource management projects has resulted in some changes to road and trail designations for OHV use that were displayed on the 2008 MVUM. These changes have been made to protect resources, minimize conflicts with other uses and provide additional motorized access opportunities. Projects of this nature usually include intensive road survey and inventory where occurrences of unauthorized use can be found and observations of resource damage (or other concerns) resulting from OHV use can be recorded. These projects serve as the primary method of updating the MVUM to ensure that OHV use is allowed only on those roads and trails that can sustain such use.

Effectiveness of Road and Trail Closures

It is difficult to say how effective trail and road closures are because the Ottawa does not systematically collect data on how many users obey the closures compared to the number or percentage of users who violate closures. There is evidence (tracks around or over barriers) of some unauthorized motor vehicle use in many areas across the Ottawa, however, this may be from a minority of users. Increased patrols have been performed in areas of known violations, but this effort produced little contact with violators. In some cases, increased patrols and increased signing appear to have reduced violations. The Forest should develop and implement practical effectiveness monitoring in areas of known, repeated violations. The goal would be to determine effectiveness of various closure devices over time, as well as reduce breaching of closure devices.

Harvested Lands Adequately Restocked

To ensure compliance with the National Forest Management Act and the 2006 Forest Plan, the Ottawa regularly monitors final timber harvests on National Forest System (NFS) lands to determine if those stands have been adequately restocked. The Ottawa performs stocking surveys to monitor the success of natural and artificial regeneration on all timber harvests with a regeneration objective. Stands that are adequately stocked with suitable tree species are usually certified by the fifth year after a regeneration harvest. Sometimes additional treatments are needed to improve stocking levels. These treatments are planned following the timber harvest, or after the first-year or third-year stocking surveys if the surveys indicate a need. The treatments include site preparation to prepare an adequate seed bed, seeding, or

planting. Regeneration harvests, site preparation treatments, stocking surveys, and regeneration certification information are all stored in the FACTS database.

In FY 2003 a total of 4,348 acres received timber harvests with a regeneration objective (shelterwood removal cuts, single tree selection cuts, and clearcuts). To determine whether the FY 2003 regeneration timber harvests were adequately stocked after five years (FY 2008), stocking surveys were performed on all stands that were not already certified to determine if they could be certified as adequately stocked. All 4,358 acres (100%) of final timber harvest acres were certified as adequately stocked.

Land Management Effects on Land Productivity

The Ottawa has supported an installation of the Long Term Soil Productivity Study (LTSP Study) since 1990 as disclosed in the 2006 M&E Report. The Ottawa installation is on the clayey soils of the Ontonagon Lake Plain, LTA 212 Jo01 (originally mapped on the Ottawa as 'LTA 19'). The Ottawa's participation in this important study contributes to determining whether forest management is resulting in significant changes to productivity of the land (measured as total biomass). The LTSP Study provides a link to show changes to soil characteristics or changes in the actual productivity of the land, as measured by biomass of merchantable trees.

Below are excerpts from a poster developed by Richard A. Voldseth, USDA Forest Service – Northern Research Station (2008), which helps to explain the LTSP Study:

With shortening rotations and increased residue utilization, the long-term sustainability of site productivity is a concern to forest management agencies. Moreover, the USDA – Forest Service is legally bound by the National Forest Management Act of 1976 to manage the land in such a way that the long-term productivity is not impaired (Powers et al. 1990, 2005). In 1989, as a result of science and management concerns, Forest Service Research scientists and National Forest System managers along with university, industry, and Canadian collaborators implemented a replicated experiment throughout North America to better understand the effects of forest management on long-term site productivity.

Soil porosity and site organic matter are properties considered to be most impacted by management operations (Powers et al. 2005). At issue is the effect of disturbance on site productivity as a result of compaction and loss of organic matter in aspen ecosystems. The study is based in a conceptual model developed by the National LTSP Program and applied to the Lake States LTSP aspen ecosystem study. Normal trends in site productivity are affected by natural cycles such as in climate. Within the limits of climate, the potential net primary productivity of a site is regulated by soil processes (biotic, chemical, physical) which are altered by disturbance via management. The primary objective for this study is to understand how organic matter removal and changes in soil porosity affect a site's productive carrying capacity and, ultimately, sustainability of biomass production.

The experimental design is a completely randomized 3 x 3 factorial; with 3 levels of soil compaction (C) and 3 levels of organic matter (OM) removal for a total of 9 core treatments (Table 1). Each set of 9 treatments is replicated 3 times at each NF.

Measurements were taken pre-harvest, pre-compaction, post-compaction (year 0), year 1, year 5, and year 10; to be sampled every 5 years thereafter. Primary measures include soil bulk density (Db), soil strength (SS), total soil carbon (Ct) and nitrogen (Nt) storage, effective cation exchange capacity (CECe), regeneration, and total aboveground plant biomass.

A 10-year report specific to the Great Lake States' installations is now in draft form, and the Eastern Region of the U.S. Forest Service is looking at strategies to complete this work. Fifteenth-year data for the Ottawa's installation of the LTSP Study were gathered in FY 2006 (vegetation sampling) and in FY 2007 (soil sampling). These sampling projects were accomplished by the U.S. Forest Service's Northern Experiment Station using the nationally-established protocols that have been used since the project began. These sample data will become part of the National LTSP database, and can contribute to a 15th year report.

LTSP may play a role in answering future questions about relationships between forest management, soil quality, climate change and carbon cycling.

Management Indicator Species (MIS)

The 2006 Forest Plan identified four MIS (a suite of benthic stream invertebrates, ruffed grouse, American marten and a spring ephemeral plant, cut-leaf toothwort). All of these species were reported initially in the 2007 M&E Report. Those initial narratives contained details on methodology and background information that will not be presented again below. The reader is encouraged to review the 2007 M&E Report for additional information as the narratives below are limited to the results of 2008 monitoring, and trends analysis, if any.

Mayfly, Stonefly, Caddisfly

A third year of monitoring for the Ephemeroptera-Plecoptera-Trichoptera (EPT) suite of benthic, aquatic invertebrates was accomplished in 2008 using protocol developed by the Ottawa staff (Dunlap 2006). Because of a high degree of year-to-year variation in the samples, 3 to 5 years of data will be necessary to establish a baseline against which to make comparisons to evaluate if there are effects from forest management on stream quality. Abundance measures such as invertebrate population density and total population estimates are expected to be highly variable, but community composition measures, such as relative proportions of various insect taxa and number of insect taxa found, should not be as variable. In 2008, a total of 30 streams were sampled across the Ottawa.

As shown in Table 6, surveys were performed by a Forest Service crew and occurred between 8/5/2008 and 9/23/2008. Three streams (North Branch Paint River, Main Stem Paint River and Pendleton Creek) were added to increase coverage of the Ottawa. Three sites sampled in 2007 were not re-sampled in 2008 (Little Presque Isle River, headwaters of the Middle Branch Ontonagon River, and Sidnaw Creek).

Table 6. Summary table of results from EPT surveys, by 300' stream reach.

Stream ^{1,2}	Survey date	EPT Density (#/ft. ²)	Mean % EPT	# EPT Taxa	Est. Population	Suitable Habitat (ft ²)
Cascade Creek	8/20/2008	45.2	0.63	10	72302	1600
Clear Creek	8/25/2008	40.8	0.93	5	1248	31
Cooks Run 1*	8/19/2008	57.2	0.78	11	349789	6115
Cooks Run 2*	8/19/2008	66.8	0.83	11	544286	8148
Cooks Run 3	8/19/2008	93	0.79	14	715021	7688
Duck Creek	8/13/2008	42.4	0.73	11	105872	2497
EB Ontonagon River*	8/21/2008	27.6	0.71	13	154008	3580
EB Presque Isle*	9/5/2008	103	0.79	16	289966	2815
Ellis Creek	8/25/2008	17.4	0.56	8	31205	1793
Jumbo River*	9/23/2008	48.4	0.68	11	519279	10729
Leveque Creek	8/19/2008	16.4	0.80	11	31173	1901
MB Ontonagon River	8/5/2008	61	0.70	14	173484	2844
Mustard Creek	8/25/2008	18	0.59	8	562	31
NB Paint River	8/15/2008	19.6	0.58	11	339629	17328
Paint River, mainstem	8/15/2008	18	0.71	11	450889	25049
Pelton Creek	8/13/2008	18.6	0.58	13	90351	4858
Pendleton Creek	8/5/2008	11.6	0.80	8	64310	5544
SB Paint River*	9/10/2008	40.4	0.56	15	131187	3247
Shane Creek*	8/21/2008	22	0.75	10	5544	252
Slate River*	9/11/2008	38.8	0.47	12	200767	5174
Spargo Creek*	8/21/2008	16.2	0.60	9	19926	1230
Stoney Creek*	8/21/2008	21.6	0.51	12	118765	5498
Sucker Creek*	8/13/2008	27.8	0.69	14	128903	4637
Tamarack River	8/5/2008	18.2	0.56	10	141086	7752
Tenderfoot Creek	8/13/2008	10.8	0.69	5	95871	8877
Thirty-three Creek*	9/10/2008	18.2	0.67	12	7568	416
Trout Creek*	9/23/2008	47.4	0.78	13	26990	569
Twomile Creek*	8/13/2008	16	0.63	11	90000	5625
Wellington Creek*	9/5/2008	60.4	0.64	13	86474	1432
WB Ontonagon River*	8/20/2008	41.6	0.59	10	589056	14160

¹ Abbreviations are defined as follows: EB (East Branch); MB (Middle Branch); NB (North Branch); and WB (West Branch).

² Those streams identified with an (*) are the 16 streams referenced in the following discussion.

Three Year Trend Analysis: Data from the 16 streams sampled in all sample years (2006, 2007 and 2008) were analyzed. Analyses suggest a decrease in EPT density and estimated populations in the 16 streams from 2006-2008. Other measures examined showed no significant change over the same period; these measures include: 1) relative proportions of EPT orders comprising the sample; 2) ratio of EPT orders to non-EPT orders (% EPT displayed in Table 6); 3) number of EPT taxa captured; and 4) amount of suitable habitat.

There are a number of possible explanations for the decrease in abundance of EPT in these streams. The Ottawa experienced a drought over this period, which could account for the decrease in numbers, however the observation that available habitat remained approximately the same over the same period argues against this possibility. Taxonomic richness (i.e., number of taxa) and community composition (i.e. proportions of EPT) remaining the same supports the possibility that climatic factors (e.g. drought) were responsible. This is because the causal factor(s) appears to be affecting the community evenly, not eliminating less tolerant taxa. For example, if sediment was the cause, those taxa that are intolerant of sediment would disappear, reducing the number of taxa. Also, because the percentage of EPT in the community remained the same, it suggests other invertebrates are affected equally. Climatic factors, such as drought, are a good explanation for such widespread affects. Another potential explanation is crew error. A different crew collected the data in 2006 than in 2007 and 2008. It is also possible that this population reduction represents nothing more than natural population fluctuations. Given the lack of decrease in taxonomic richness and community composition, EPT populations are likely to recover quickly.

We believe it is that our management actions (e.g., logging or road maintenance practices) reduced EPT numbers across all 16 streams. No Ottawa management activities occurring during this period would have been able to systematically affect all of these sites because of the wide geographic extent of the 16 streams. Management activities would be more likely to cause localized reductions in specific stream segments due to sediment production or decreasing shade.

In conclusion, several potential explanations exist for the decrease in EPT populations over the analysis period. However, insufficient evidence exists to settle on one or more as causes. Additional years of monitoring are required to eliminate the possibility that this decrease is not simply a natural population fluctuation. A longer monitoring period would also reduce variability associated with different field crews and year to year environmental variation.

Ruffed Grouse

Ruffed grouse are a highly sought-after game bird that relies largely on aspen/paper birch habitats in a variety of age classes, though any dense young forests with suitable structural characteristics constitute good habitat. Dense, young sapling stands are used for brood rearing; pole stands are used for cover; mature aspen/birch stands provide food even through the winter; and additional cover. Ruffed grouse are inherently cyclical in their populations, following a 7-10 year cycle.

The 2006 Forest Plan calls for a mix of age classes within the aspen/paper birch vegetation type to support conservation, economic, and social objectives associated with early

successional habitats (p. 2-6). The long-term objective is to maintain at least 12,000 acres of 0-9 year aspen/paper birch regeneration for ruffed grouse habitat, well-distributed on lands suited for timber production (Forest Plan, p. 2-8). Over time this will ensure provision of all age classes of aspen.

As of 2008, there are about 8,225 acres of aspen/paper birch in the 0-9 year age class, which is about one-third below the long-term objective for the Forest (see Figure 3). Over the next 10-20 years, the Forest plans to continue to conduct regeneration harvests on mature stands to ensure a suitable mix of the aspen/paper birch forest type exists and stands are maintained within the desired vegetation composition range for various management areas (Forest Plan, p. 2-6). With the large amount of aspen/paper birch in the 70-year age class and older (40,521 acres) the amount of aspen/paper birch in the 0-9 year age class is expected to increase over the next decade.

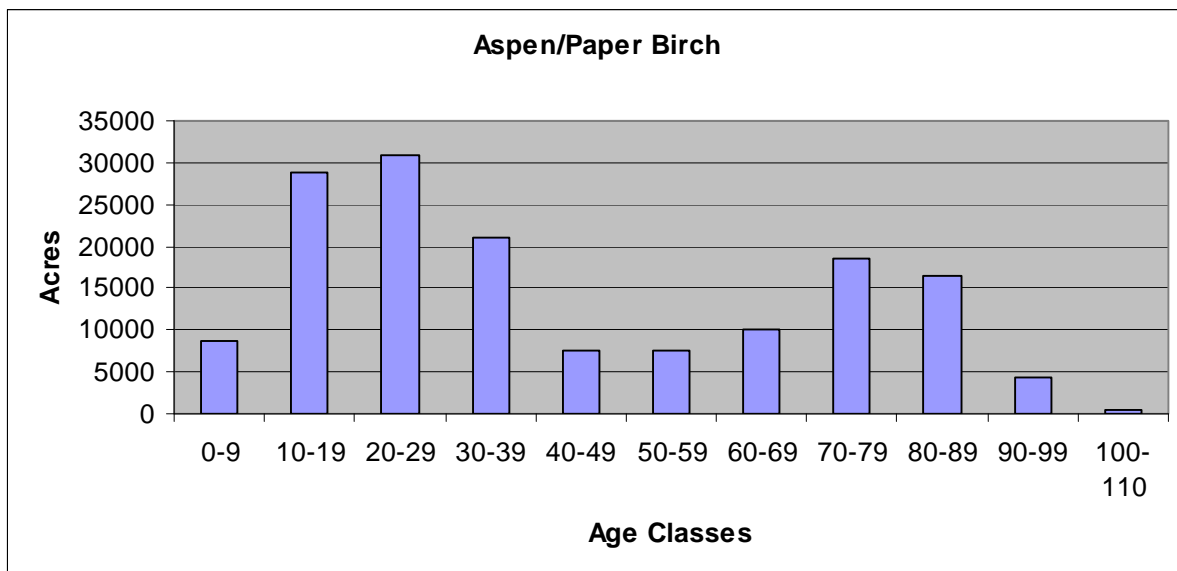


Figure 3 Acres of aspen forest types by 10-year age classes, Ottawa, 2008

Status of Population: Ruffed grouse populations on the Ottawa are monitored through standard drumming survey routes in cooperation with MDNR. Grouse populations peaked in 1999 and declined in the following years, bottoming out in 2004 at 9.1 drums per route. Populations have increased since 2004 and have reached 24.9 drums per route in 2008. The highest number of responses was 46 (Paulding West – a Watersmeet Route) and the lowest number of responses was 8 (Gardner- a Kenton Route). A total of 17 routes were monitored by Ottawa staff (Figure 4). As a whole, ruffed grouse populations are highly variable between years, and seem to follow a 7-10 year cycle. Populations appear to be on the rebound and should peak again around 2009-2010.

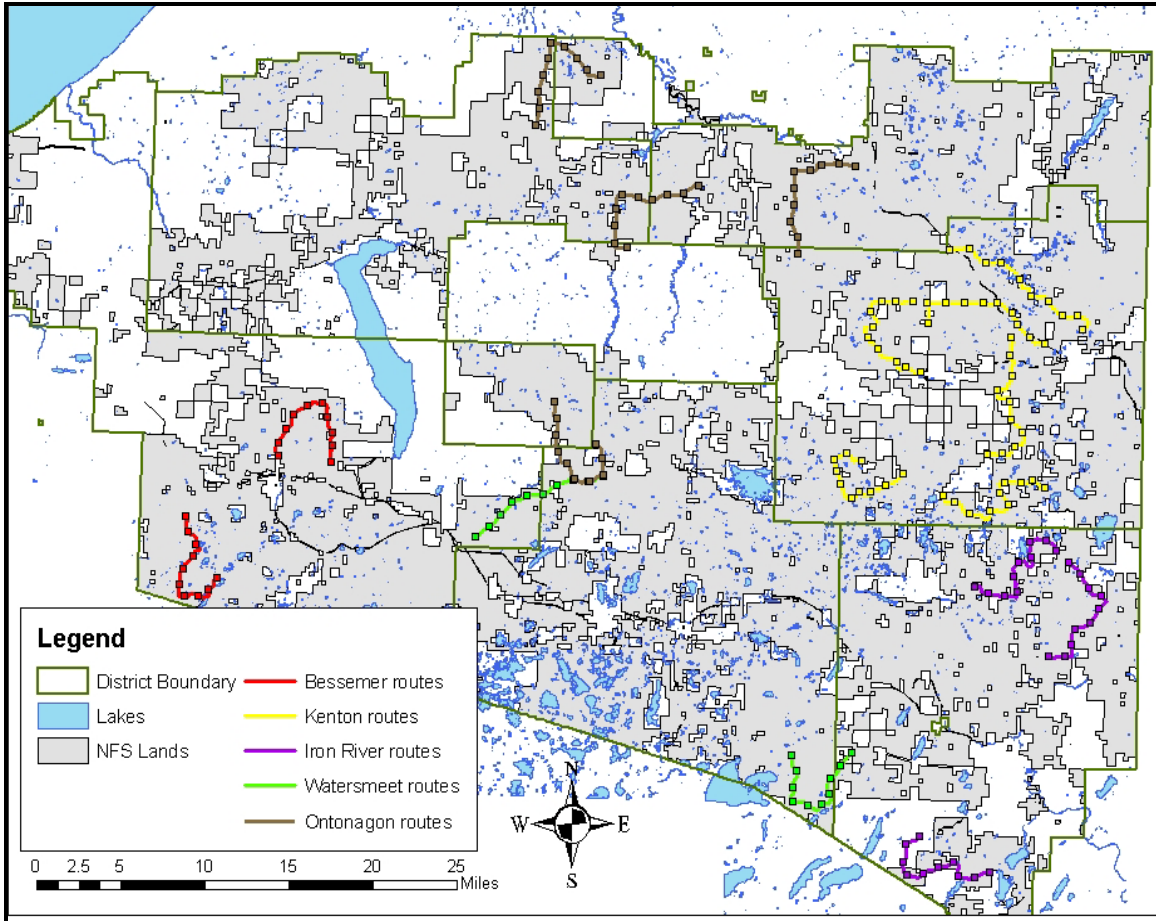


Figure 4 Location of Ruffed Grouse Monitoring Routes, Ottawa, 2008

Implementation of the 2006 Forest Plan has aided this species through regenerating over-mature aspen stands. Without active forest management, aspen as a forest type would decline significantly on the Forest, and grouse populations would decline as well. The Forest will continue to seek opportunities to regenerate aspen as well as other forest types via even-aged management in appropriate locations, and will monitor population trends. The Forest will continue to work with sporting groups, such as the Ruffed Grouse Society, to improve grouse habitat and look into areas that have potential for non-commercial aspen management.

American Marten

The Ottawa selected the marten as an MIS for large tracts of mature forest habitat with abundant vertical and horizontal cover. This species is considered a game animal (furbearer) by the State of Michigan. American marten are a Regional Forester’s Sensitive Species (RFSS) on the adjacent, Chequamegon-Nicolet National Forest, and listed as threatened by the State of Wisconsin, where the species is not recovering to the extent they are in Michigan.

Nearly all Management Areas (MAs) on the Ottawa contain potentially-suitable marten habitat, with the possible exception of MA 4.2a which has a short-lived conifer emphasis. Not all suitable habitats on the Ottawa have resident marten as yet, since the populations are still expanding.

Status of Population: The best forest-wide dataset on marten is available via Michigan DNR’s fur harvest registration program as described in the 2007 M&E Report. Table 7 shows the number of marten registered within the portion of the western UP that comprises the Ottawa. The number of trapped marten over the last 8 years has gradually increased across the Ottawa and the western U.P. indicating an increasing population of marten. In 2007, the number of trappers did not differ significantly than in 2006, and the number of marten registered remained about the same (Michigan DNR, 2007). While the numbers shown in Table 7 indicate stable numbers of marten trapped on the Ottawa, the counties within the Ottawa have increased from 48 animals in 2005 to 84 animals in 2007 (Michigan DNR 2005, 2006, & 2007).

Table 7. Number of Marten Registered in the Western U.P. 2000-2007.

Year	Number of Marten Registered on or within 1 mile of the Ottawa National Forest’s Proclamation Boundary	Number of Marten Registered for Baraga, Gogebic, Houghton, Iron, and Ontonagon Counties
2000	23	37
2001	50	71
2002	28	37
2003	39	50
2004	30	48
2005	29	48
2006	42	77
2007	41	84

Because trappers are required to divulge the section where they trapped their marten, a map has been generated to display where all the trapping locations have occurred from 2000 to 2006 (see Figure 5). Certain areas of the Ottawa do not have marten trapping locations, which could be due to one of two reasons: 1) trappers may be operating, but have failed to capture marten because marten have not yet colonized a particular area; or 2) an area has not experienced trapping pressure for some reason (e.g., lack of road/trail access, or lack of interest by local residents in marten trapping).

The three wilderness areas on the Ottawa do not have any marten trapping locations within them, nor does Porcupine Mountain Wilderness State Park. These areas would likely have some of the best marten habitat in the region, as they are largely old growth hardwood/hemlock stands. However, no marten are known to occur in these locations according to trapping records, which may be due to difficult access or lack of trappers to trap in these areas.

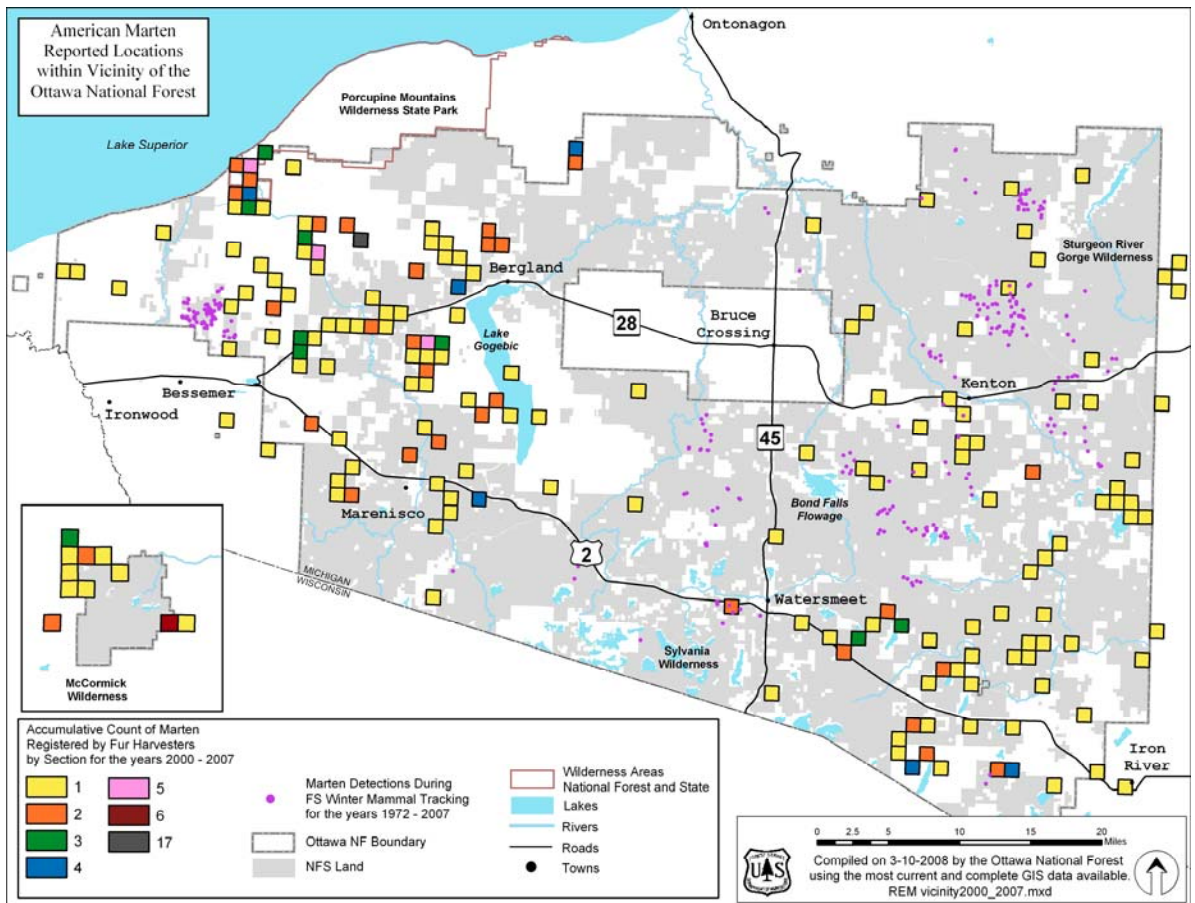


Figure 5 Locations of marten on or within one mile of the Ottawa National Forest Proclamation Boundary

Additional population data can be gleaned from winter mammal tracking efforts across the Ottawa (see purple dots on Figure 5). These tracking efforts are largely directed toward pre-project monitoring efforts in timber sale areas. Many parts of the Ottawa have not been surveyed; therefore we have no data on marten presence in those areas. There were a few areas where marten were surveyed in 2008, but none were found. Conversely, many marten have been found in some areas where there are no trapping registrations.

Cutleaf Toothwort

Cutleaf toothwort was selected as an indicator species for management in northern hardwoods, a dominant forest type which is managed for timber on the Ottawa. In 2008, the Ottawa completed the third year of monitoring this new indicator species by looking in the most likely places for this plant and observing if it was present. Based on the literature and local experience, occurrence of the cutleaf toothwort is most likely in rich hardwood sites.

Using the Ottawa's geographic information system (GIS), stands that were mapped as northern hardwoods and that occurred on richer ecological land type phases were selected for survey. Stands were divided into harvested and unharvested groups, and several of the larger, easily accessible stands in each category were selected for survey. No stands from

2006 or 2007 were re-sampled in 2008. In each stand, a meander survey was conducted (see 2006 M&E report for details of methods used).

Thirty-six stands were surveyed in late May and early June 2008 by an Ottawa botanist and technician. Each survey lasted about one hour. While all these stands were expected to have equal potential for cutleaf toothwort, it was observed in only 19 of the 36 stands. Nine of the stands with toothwort had no timber harvest history (Ottawa data extend back only about 40 years, however); the other ten were harvested between 1978 and 1999. In six of the stands, toothwort was observed at “trace” levels; in the other 13, it was recorded as occasional to extensive.

The 2006-2008 data sets were combined for analysis. Cutleaf toothwort was found in 36 of 75 stands (48%); it was found in 17 (43%) of the stands with recorded timber harvests and 19 (54%) of the stands with no recorded timber harvesting. Toothwort abundance data were plotted against possible correlating stand factors, such as presence of other spring ephemerals, amount of coarse woody debris, microtopography, sugar maple regeneration and weedy ground flora.



Photo 1. Cutleaf toothwort in bloom.

There was no statistically significant difference for the occurrence of cutleaf toothwort in harvested vs. unharvested stands and no particular patterns were noted. Stand monitoring will continue in 2009. The Ottawa may also begin some toothwort monitoring where toothwort abundance is surveyed in hardwood stands before and after harvest treatments. Before and after monitoring can be easier to interpret since the stand conditions are fixed except for the variables of interest.

Non-Native Invasive Species

Plants

Non-native invasive plants (NNIP) of concern for the Ottawa include three categories: federally listed, state listed, and Forest concern plants. Current NNIP of concern have not changed since the 2006 and 2007 reports.

The Ottawa’s list includes ten high priority species, eleven new invader/high priority species, and eight medium priority species.

Numerous other non-native plants are considered low priority or non-invasive.



Photo 2. Chemical treatment of crown vetch.

Annually, Ottawa staff, contractors, and volunteers record new infestations of high priority invasive plants and larger, non-roadside, infestations of medium priority invaders encountered during field work.

The number of sites reported yearly varies with the search effort. Annually, the Forest treats some infestations, prioritized by type of NNIP, size and location of infestation, and resources available. Many different strategies are being employed to control invasive plants across the Ottawa, including mechanical, chemical and biological methods (see Table 8). Survey efforts to locate new infestations and surveillance of known infestations are on-going.



Photo 3. Mechanical treatment of Japanese barberry.

Table 8. Efforts to eradicate non-native invasive plants across the Ottawa, 2008.

Infested acres treated	183.6
Terrestrial	118.0
Aquatic	65.6
Manual treatment	14.5
Mowing/mechanical	23.3
Herbicide	135.8
Biological (<i>Galerucella</i> beetles)	10.0
Species treated	Japanese barberry; purple loosestrife; bush honeysuckles; garlic mustard; Japanese and giant knotweeds; garden valerian; Eurasian watermilfoil; marsh, bull, and Canada thistles; leafy spurge; glossy and common buckthorns; spotted knapweed; crown vetch; sweet clover; flat pea; reed canary grass; giant hogweed; crack willow; wild chervil; and birds-foot trefoil.
New infestations mapped	262 NNIP sites on NFS land (increase partly reflects increased search effort and more Forest staff trained to document NNIP infestations). Sites mapped included about 219 gross acres and 69 acres infested.
Water bodies surveyed for aquatic nuisance plants	10 lakes
New aquatic NNIP infestations Found	No NFS surveys (Partners found Eurasian watermilfoil in Lac Vieux Desert on the Wisconsin side)
Treatment sites monitored	33 sites (treated in 2007 and 2008), 117.4 acres
Treatment efficacy, average by acre	56% treatment efficacy, which corresponds to a rating of “Fair: Over half of the species population was controlled.”

Efficacy rated “good” or “complete”	17 sites (52%)
Poorest efficacy	7.5 acres of crown vetch along FR 1100 and 3.4 acres of glossy buckthorn, both treated in 2007, received a rating of “Poor: Treatment killed less than a quarter of the target species population.” The glossy buckthorn treatment was intended to just kill large fruiting bushes along a main road. The bulk of the population was untreated. We are uncertain why the crown vetch treatment was unsuccessful.

Animals

In 2008, 10 lakes and streams were surveyed for aquatic invasive plant and animal species. Monitoring was performed by a combination of Forest Service personnel, contractors, lake associations, counties, and townships. There were no new occurrences of the previously reported six aquatic non-native invasive animal species confirmed on the Ottawa (2007 M&E Report), nor any new infestations of species not already identified on the Ottawa. Also, no occurrences of *Dreissena polymorpha* (zebra mussel) and *Potamopyrgus antipodarum* (New Zealand mud snail) were reported on the Forest in 2008, although they continue to occur in nearby waterbodies (2007 M&E Report). Five species of exotic earthworms continue to exist on the Ottawa (2007 M&E Report). One site on the Ottawa west of Watersmeet was sampled in 2008 and was found to be colonized by the exotic earthworms.

In addition to surveys for new NNIS occurrences, control treatments and prevention activities for rusty crayfish were tracked in 2008. Ottawa personnel trapped and removed large rusty crayfish in Lake Ottawa (Iron County). Seventy commercial crayfish traps baited with fish carcasses were set and pulled daily for one month. This effort resulted in the removal of 3,879 rusty crayfish (155 lbs) from the lake. Perch Lake (Iron County) lakeside landowners also trapped rusty crayfish in 2008.

To increase the effectiveness of their predation on rusty crayfish, the MDNR instituted special catch and release regulations for smallmouth bass in Lake Ottawa designed to increase average bass size (see the 2007 M&E Report for more information). Crayfish and smallmouth bass populations were monitored in Lake Ottawa by graduate students and staff from the University of Notre Dame Environmental Research Center (UNDERC). The abundance of all species of crayfish was estimated as was the population size of the smallmouth bass. These parameters were assessed to determine if rusty crayfish control efforts, including the temporary no-kill bass regulation, were successfully controlling the crayfish and allowing Lake Ottawa to recover. The monitoring occurred between June and August 2008. Preliminary results indicate that the control efforts appear to be reducing the rusty crayfish population in Lake Ottawa (A. Baldrige, pers. communication 2008, Peters and Lodge 2007). However, the research also indicates that the large areas of cobble substrate in Lake Ottawa are especially conducive to rusty crayfish use, and therefore, eradication of the exotic crayfish in this lake is unlikely. The research is focused on controlling crayfish population numbers to levels that allow re-vegetation of the lake and a healthier balance among the aquatic species.

Tribal Rights and Interests

The Forest Service shares in the United States' trust responsibility and treaty obligations to work with federally-recognized tribes on a government-to-government basis to protect the tribes' ceded territories on lands administered by the Forest Service. As such, the policies of the Forest Service toward federally-recognized tribes are intended to strengthen relationships and further tribal sovereignty through fulfilling mandated responsibilities. The Ottawa outlines its policies and responsibilities on tribal relations in a 1999 Memorandum of Understanding (MOU) (Tribal – USDA Forest Service relations on National Forest Lands within the territories ceded in treaties of 1836, 1837, and 1842) including tribal consultation on proposed forest projects and policies. The 2006 Forest Plan was developed through consultation with the tribes.

Forest Service leadership meets with the MOU tribal signatories annually, to discuss MOU implementation, facilitate on-going communication, and discuss issues arising under the MOU. Through provisions in the MOU, projects and processes have been put into place without notable instances of complications. Some activities include notification of birch bark gathering opportunities, designation of sugarbushes, implementation of fee and length of stay waivers for tribal members staying in campgrounds while exercising treaty rights, and implementation of an off-reservation National Forest gathering code. Implementation of the 2006 Forest Plan has facilitated MOU implementation.

Species of Viability Concern

Plants

This monitoring item is designed to track the viability of rare plant species on the Forest, and the extent to which Forest management responds or contributes to their viability. It includes Regional Forester's Sensitive Species (RFSS) and some Michigan endangered or threatened plants which are not concurrently designated as RFSS plants. Both vascular and nonvascular (lichens, mosses, liverworts) plants are included.

Monitoring is recommended for a portion of the total documented rare plant sites each year, so that most sites are checked periodically. Stable robust sites may need less monitoring, while critical sites may need more frequent checks. However, lack of resources has limited the extent of rare plant population monitoring.

Revisits of rare plant populations occur informally by Ottawa botanists or biologists when they are in the area of a documented site and have time to check the population. More formal revisits have been conducted under contract (f2003 and 2004). Some of the Forest's rare plant records are quite old, and pre-date the use of handheld global positioning system (GPS) making relocation of these units more difficult. Some documentation is derived from herbarium records and state heritage program records, which may not include specific location information. Thus, a revisit that does not locate plants does not always mean the population is extirpated.

This item also includes inventory for new rare plant populations, which occurs during pre-project field surveys and also during surveys focused on a specific habitat, geographic area, or taxon. These surveys are conducted by Ottawa botanists, technicians, volunteers and contractors. Occasionally, new rare plant sites are reported to the Forest by visitors.



Photo 4. White fawnlily, found in 2008 on the Ottawa.

Over 15,000 acres were surveyed for rare plants in 2008. Ottawa botanists and biologists revisited 12 rare plant populations. All but two were found to be surviving. The missing two may be extirpated, or the plants could have already completed their life cycle and disappeared by the revisit date. Species revisited included *Astragalus canadensis* (Canadian milk-vetch); *Collinsia parviflora* (smallflower blue-eyed mary); *Disporum hookeri* (fairy bells); *Dryopteris goldiana* (Goldie's woodfern); *Gratiola aurea* (golden hedgehyssop, not found); *Mimulus guttatus* (seep monkeyflower); *Myriophyllum farwellii* (Farwell's watermilfoil); *Orobanche uniflora* (oneflowered broomrape, not found); *Pterospora andromedea* (woodland pinedrops); *Silene nivea* (evening campion); *Vaccinium caespitosum* (dwarf bilberry); and *Viola lanceolata* (lance-leaved violet).

Twenty-seven new rare plant populations were found in 2008, including *Astragalus canadensis* (Canadian milk-vetch, 3 sites); *Bidens discoidea* (small beggarticks, 1); *Carex backii* (Back's sedge, 4); *Collinsia parviflora* (smallflower blue-eyed mary, 7); *Dentaria maxima* (large toothwort, 2); *Dryopteris fragrans* (fragrant woodfern, 1); *Erythronium albidum* (white fawnlily, 2, see Photo 4); *Orobanche uniflora* (oneflowered broomrape, 1); *Pterospora andromedea* (woodland pinedrops, 1); *Ranunculus gmelinii* (Gmelin's buttercup, 1); *Silene nivea* (evening campion, 3); and *Usnea longissima* (beard lichen, 1). Several populations of the state special concern grass, *Danthonia compressa* (flattened oatgrass), were also located, and one extensive population of the state special concern *Thalictrum venulosum* var. *confine* (veiny meadow-rue) was also found.



Photo 5. Beard lichen, found 2008 on the Ottawa.

Trumpeter Swan

Trumpeter swans are classified as RFSS on the Ottawa, listed as threatened in Michigan, but are not federally listed. Trumpeter swans are rare but are becoming more common, both regionally and on the Ottawa. The Forest Plan does not include direction specific to swans,

but several guidelines, such as those for protection of species of viability concern are applicable (pp. 2-27 and 2-28).

Status of Habitat: Trumpeter swans prefer and are most successful in areas with a highly irregular shoreline, water depth less than four feet, emergent vegetation, abundant and diverse aquatic vegetation communities, early ice-off, and many available nesting sites. Habitat for this species includes large shallow, fertile marshes, beaver ponds or lakes with a profusion of submerged and emergent plants, and generally timbered but well-vegetated shorelines. (USDA-Forest Service-Eastern Region 2002). Quality habitat for swans is common on the Ottawa, with much apparently-suitable habitat unoccupied.

Generally, swan habitat quality has not been directly influenced by Forest Plan implementation. Beaver ponds and shallow wetlands, preferred swan nesting habitat, have low recreational watercraft value. The carrying capacity of the western U.P. for beavers may have peaked and may decline as our forest matures. The result may be fewer beaver ponds to serve as potential swan habitat. This, combined with warmer, drier summers, may limit ability of the forested areas to provide more swan habitat in the future.

Swan foraging habitat ranges from secluded wetlands and ponds to large, open lakes. However, recreational watercraft use may impact swans foraging through disturbance or more direct impacts on or near larger water bodies (USDA-Forest Service, 2002). With riparian buffers in place, vegetation management on the Ottawa does not affect habitat quality for swans.

Private land around many lakes used by trumpeter swans continues to be developed for residential use, which may result in a deterioration of overall habitat quality over time. Other localized threats include lead poisoning due to ingestion of lead shot or lead fishing sinkers; direct human-caused mortality or harassment (illegal shooting/illegal chase). Other concerns include artificial feeding of swans by people, which could cause the swans to lose their fear of humans and become dependant on artificial food sources. Other factors which have the potential to negatively impact trumpeter swans over time in this area include higher levels of watercraft use, lower water levels, and the spread of aquatic nuisance species.

Regulations prohibiting use of lead shot for waterfowl hunting have undoubtedly played a role in the high survival of released swans. However, swan reintroductions elsewhere in their range have been hampered by swans ingesting spent lead. Also, illegal or mistaken shooting of swans has hindered swan reintroductions elsewhere. Whereas, waterfowl hunting pressure on the Ottawa is relatively low and no illegal kills have been recorded on the Ottawa.

Status of Population: Introduced to the western U.P. in the late 1990s, the first documented breeding on the Ottawa occurred in 2003. This successful nesting attempt produced four fledged cygnets by a breeding pair comprised of an unbanded, uncollared female and a collared male from Vilas County, WI. This pair produced another five cygnets the following year (USDA Forest Service 2005). Since that time, other nesting pairs and single swans have been observed on or near the Ottawa.

Table 9 displays production of cygnets on the Ottawa since the first observations in 2003. Also included are the number of adults (total collared and uncollared), uncollared adults, known adult mortality, nesting attempts, and nesting failures. This additional information may provide a better indication of actual productivity in any given year. This monitoring data is derived from the Ottawa National Forest Threatened, Endangered, and Sensitive species database.

Table 9. Trumpeter swans found on the Ottawa National Forest, 2003-2008.

Swans	Year					
	2003	2004	2005	2006	2007	2008*
Adults (total)	6	8	16	16	21	8
Uncollared Adults	5	6	11	9	4	-
Adult Mortality (known)	0	0	2	0	0	-
Cygnets Fledged	8	6	4	13	17	10
Nesting Attempts	3	2	5	5	8	3
Nesting Failures	0	0	2	1	3	-

*Some data elements were not monitored in 2008 or are unknown.

Nearly 29% more adult swans were observed in 2007 (the last year of full survey efforts) when compared to the total swans observed in 2003. Additionally, nearly 47% more cygnets fledged in 2007 when compared to the same data for 2003. The only known mortality of adult swans (2) on the Ottawa was observed in 2005. The cause of the mortalities has not been determined, but may have been a shooting of a pair, as the birds were found dead next to one another. State of decomposition was advanced, so definitive statements could not be made. Data from 2008 is not reflective of actual population numbers, as our survey efforts were many less than previous years.

The U.P. population is expanding, with about 345 individuals, mostly at the Seney National Wildlife Refuge in late summer of 2005 (Johnson, 2005). Newer survey data is not available at the U.P. scale, but the population has continued to expand, and there are probably in excess of 400 swans in the U.P. population at the time of this writing. There is an expanding breeding population immediately adjacent to the Ottawa in northern Wisconsin, as well. It is suspected that there is considerable mingling of U.P. swan population and the northern Wisconsin population.

Conclusions and Actions: From the above data, it would appear that swan productivity has increased over the last few years on the Ottawa. However, the 2008 data could suggest that there has been a marked decrease in swans and nesting activity on the Ottawa. The data does not reveal that most swan observations are by chance and that an annual, structured, monitoring protocol and plan has not been established for swan nesting and occurrence on the Ottawa. An established monitoring plan may help alleviate these inconsistencies in the monitoring data. In 2005 and 2006, monitoring overflights were conducted, which enabled us to find new pairs and easily find swans on larger waterbodies. With the rapid expansion of this species, periodic flights should be scheduled to discover newly-established territories.

There has been a trend toward earlier ice-off of lakes in our area over the last 15 years or more, which appears to be accelerating the date at which adult trumpeter swans return and begin nesting in the spring. It is unknown how or if this trend has or will affect swan productivity on the Ottawa.

The Ottawa will continue to work with agencies and groups, such as the Departments of Natural Resources for both Michigan and Wisconsin, to monitor trumpeter breeding success on the Forest, as well as threats to trumpeter swans or swan habitat. Every five years, a thorough survey of trumpeter swans is completed across Michigan and the rest of the U.S. The most-recent effort was in 2005 (Johnson, 2005) and the next one is scheduled for 2010. The Ottawa should plan to increase the level of survey effort in spring/summer 2010 to contribute to this larger endeavor. The Ottawa will continue to protect trumpeter swans and swan habitat by implementing direction found in the Forest Plan.

Conservation of Threatened and Endangered Species (TES)

Canada Lynx

The 2007 M&E Report covered Canada lynx in a more thorough fashion, and the reader is encouraged to look at that Report for background information on Forest Plan direction, habitat management efforts, and monitoring methods. Canada lynx are classified as federally threatened throughout the contiguous United States, and listed as endangered by the State of Michigan. There have been no verified records of Canada lynx presence in the western U.P. since the early 1960s (Ruggerio, p. 218 - 219). The most recent verified record of an individual in the western U.P. is from 1962 of an individual shot in Ontonagon County.

The most recent record of a lynx in Michigan occurred on the eastern end of the U.P. (Mackinac County) in November 2003. The animal was caught accidentally in a leg hold trap and released unharmed. Genetic samples were obtained and the individual was verified as a Canada lynx with no evidence of hybridization. Prior to 2003, the latest verified record was an individual killed in 1983, also in Mackinac County.

Immigration of lynx into the U.P. is always a possibility due to irruptions of the hare cycle and follow-up lynx populations far to the north. However, prospects are unlikely that lynx will establish a permanent population in the U.P. due to factors related to poor habitat, low snowshoe hare densities, many competitors for hares, and sub-optimal snow conditions here in the western U.P. (USDA Forest Service, 2005). As a result, the Ottawa's strategy via Forest Plan implementation is to provide favorable dispersal conditions for potentially immigrating lynx. Providing suitable habitat for snowshoe hare, which is the main prey item for lynx as well as many other predators found on the Ottawa, is essential to this strategy.

The Forest Plan includes goals and objectives that are pertinent to production of prey species such as snowshoe hare and ruffed grouse and thus applicable to lynx forage needs. There is direction to maintain connectivity habitat for lynx dispersal across the Ottawa and direction to provide a Remote Habitat Area (RHA) to benefit species sensitive to human intrusion (Forest Plan, pp. 2-9 and 2-29).

Overall, the Forest has not been meeting the habitat guidelines described in the Forest Plan relative to lynx habitat. In 2008, about 1,077 acres of aspen and about 94 acres of aspen/fir were clearcut for a total of about 1,171 acres. This is below the pace of 1,700 acres/year required to achieve desired vegetative compositions for aspen presented in the Forest Plan. At present, about 22% of the aspen type is between 5-20 years of age, compared to the Forest Plan's guideline striving for 25% of the aspen acreage in that age range.

Only about 12 acres of jack pine were clearcut in 2008, 27% of which is between 10-30 years of age, compared to the Forest Plan's guideline of 30%. About 7 acres were clearcut in the lowland conifer forest types, which was identified in the Forest Plan as a source of optimal hare habitat that could be explored for regeneration opportunities. At this time, only about 60 acres of lowland conifer types, out of 23,605 acres on suited lands, are between the ages of 0-9 years.

Winter mammal tracking continued to be performed in 2008 as discussed in the 2007 M&E Report. No lynx have been detected during these surveys. No reports of lynx presence in the U.P. were received in 2008. One report of lynx tracks from the Keweenaw Peninsula was investigated in November 2007 by the MDNR. It was determined that the tracks were not lynx and more likely canid (personal communication, Dean Beyer, MDNR, February, 2009). No reports of lynx killed or seen were reported to the MDNR as a result of the extensive recreational effort put forth by hundreds of sportsmen in 2008 (i.e., October 25-February 28 bobcat hunting and trapping season).

At this time, it is unlikely that a population of lynx is resident in the western U.P. Data gathered by the Ottawa and MDNR have been extensive in geographic coverage, and extends over many years, with no evidence of lynx presence detected. We continue to monitor suitable habitats for lynx presence, because an immigrating lynx could appear at any time.

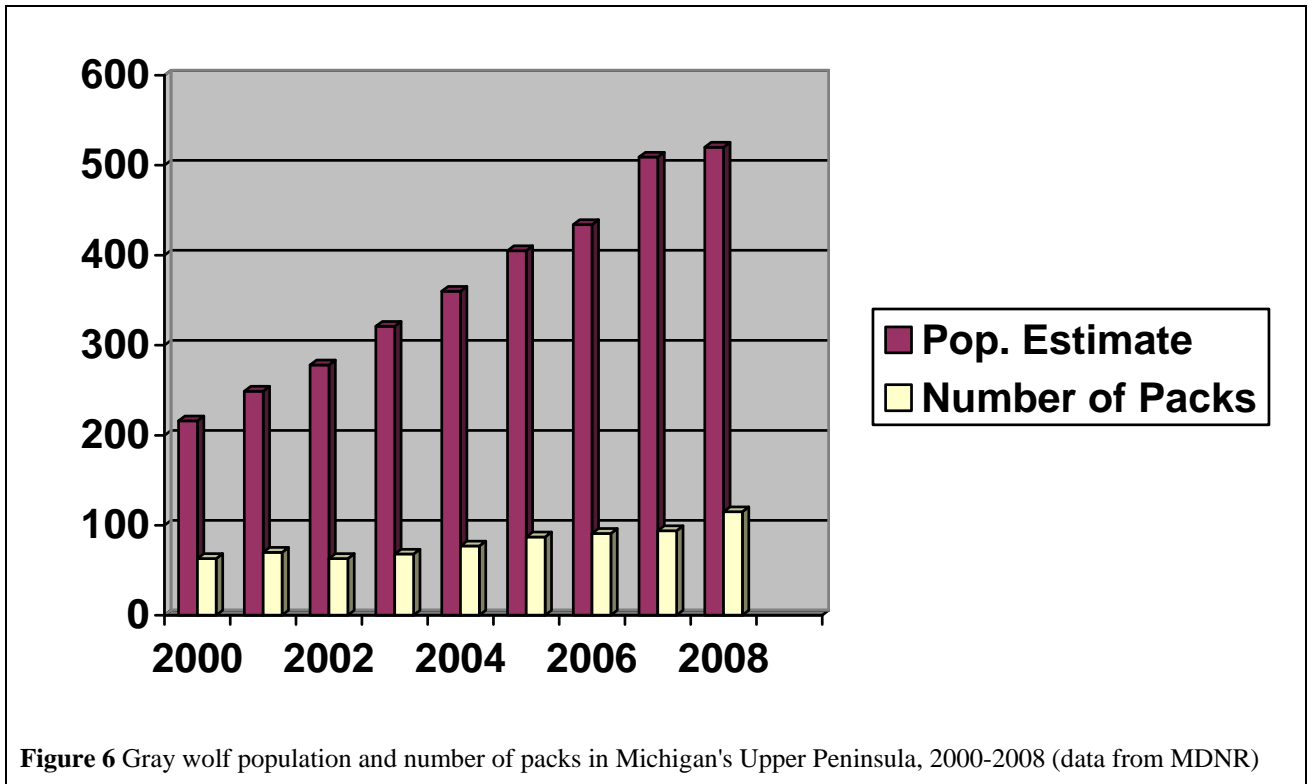
Gray Wolf

The gray wolf was first listed as a federally-endangered species in Michigan in 1974, shortly after the passage of the Endangered Species Act. Throughout the 1970s and most of the 1980s, wolf numbers in the Upper Peninsula remained very low, with few confirmed reports of wolf occurrence and no evidence of a breeding population. In 1989, however, wolf reproduction was confirmed in the U.P. for the first time, and the population began to grow at a fairly rapid rate.

Annual population increases of 10% or more have occurred in a majority of years since then, although that rate of growth has slowed somewhat in recent years (growth between 2005 and 2006 was just 6.7%; and between 2007 and 2008 was 2%). The official MDNR estimate of gray wolf numbers in the UP as of 2008 is 520 animals, in 115 packs (see Figure 7 below).

Since 2003, the legal status of wolves in Michigan has changed several times. The U.S. Fish and Wildlife Service (USFWS) published a final rule on February 8, 2007, identifying and removing wolves in the Western Great Lakes region from the Endangered Species Act protection. A court decision in September 2008, however, vacated and remanded the 2007 final rule back to the USFWS. On January 14, 2009, the USFWS reissued the decision to

delist gray wolves in the Western Great Lakes region. However, before that decision could be published in the Federal Register, it was put on hold for further review by the incoming presidential administration. Therefore, as of this time (March 2009), wolves remain listed as federally-endangered in Michigan and Wisconsin.



The State of Michigan first published a Gray Wolf Recovery and Management Plan in 1997, outlining actions to be taken to fully recover wolves within Michigan. With an increase in wolf populations since 1997, and federal legal status on the verge of changing, Michigan published a revised Wolf Management Plan in 2008. The 2008 Plan provides strategic guidance for the management of wolves in Michigan, although it does not outline operational details.

The guidance provided in the 2008 Michigan Wolf Management Plan is fully consistent with objectives, standards, and guidelines related to wolf management found in the Forest Plan. The Forest Plan contains direction to manage for viable populations of gray wolf (and other species of viability concern). Specifically, a 256,000-acre portion of the Ottawa known as the Remote Habitat Area (RHA) is to be managed to provide habitat for species that require some degree of remoteness from human activity, including the gray wolf. The RHA also includes direction to manage for habitat for wolf prey species, particularly white-tailed deer. In addition, special protection measures are to be applied to gray wolf den and rendezvous sites, whenever they are discovered on the Forest.

Deer habitat is also maintained elsewhere on the Forest through practices, such as aspen regeneration, maintenance of conifer types for winter thermal cover, and maintenance of permanent upland openings. The Forest will continue to reduce open road densities in areas that exceed Forest Plan direction, while also continuing to manage for habitat for wolf prey species in areas suited to such management.

Status of Population: Wolves now occur across the entire Ottawa, in areas of suitable habitat. Estimated numbers of wolf packs in 2008, on or near the Ottawa, are displayed in Table 10, by county.

Table 10. Gray wolf population estimates and number of wolf packs occurring on or near the Ottawa National Forest in 2008, by county¹.

County	Number of Wolves	Number of Packs
Iron	28	6
Houghton	16	2
Gogebic	110	18
Baraga	6	1
Ontonagon	37	10
Total	197	37

¹ (data from MDNR)

Smaller increases in wolf numbers in the last few years than occurred previously may indicate that the population (particularly for the Ottawa and the western U.P.) is reaching a point where a majority of suitable habitat is now occupied. If that is indeed the case, growth of the wolf population in our area may slow further or even remain fairly static over the next several years. Yearly fluctuations in numbers are likely to continue to occur, however, as a result of factors such as winter weather and prey availability.

Conclusion and Actions: With wolves apparently nearing final federal delisting for Michigan and adjacent Great Lakes states, the focus of wolf management on the Ottawa and elsewhere in our region is shifting from recovery to management. In addition to the Forest Plan Objectives for gray wolf, the Ottawa will continue to work with other agencies and groups, such as the MDNR and the Timber Wolf Alliance, to provide for the maintenance of healthy, sustainable wolf populations within the Ottawa. These efforts may include such things as promoting public information and education programs about wolves, assisting MDNR with wolf monitoring where needed, and/or other actions as appropriate.

Kirtland's Warbler

The Kirtland's warbler (KW) is currently listed as a federally endangered species. No critical habitat or essential habitat has been designated nor proposed for this species on the Ottawa. The Forest Plan outlines goals and objectives for KW, including developing habitat by designing and configuring jack pine treatment blocks that mimic stand replacing fires. Emphasis for this management includes jack pine forest regeneration and maintenance within Management Areas (MAs) 4.1 and 4.2. In addition, Kirtland's warbler breeding habitat will be managed for primarily in the Baraga Plains area, but also in some other areas on the

Kenton Ranger District. Planning efforts started in 2008 for the Baraga Plains Integrated Ecosystem Management Project include a proposal to regenerate a 520-acre block of jack pine to proceed toward desired conditions for KW habitat as outlined in the Forest Plan.

Between the years 1991-2007, ten occurrences of KW were reported on state land (Copper Country State Forest) in the Baraga Plains. These were the closest known occurrences of KW to the Ottawa during this time (see Table 11).

In June of 2008, some potentially suitable KW habitat on the Ottawa was surveyed for singing KW males. No KWs were detected during these efforts. However, on July 7, 2008, an Ottawa employee reported a singing bird on the Ottawa side of the Baraga Plains as possibly being a KW.



Photo 6. Kirtland’s warbler.

The bird was located and photographed, and it was confirmed to be a first-year male KW (see Photo 6). This is the first confirmed KW occurrence on the Ottawa. The area was visited about five times over the following two weeks, and although the singing male was repeatedly located, no females were detected.

Status of Habitat: Kirtland’s warblers typically occupy jack pine stands in patches greater than 80 acres in size with a stocking density of 1,100+ trees per acre and with about 25% of each acre being small openings. These conditions were historically created by stand-replacing fires on sandy outwash plains. Use of regenerated jack pine stands will typically begin once the tree height reaches five to seven feet or at an age of approximately six to ten years old. In general, occupancy will continue as long as the jack pine trees retain relatively dense living branches near the ground, usually around seventeen years old.

Table 11. Acres of suitable and unsuitable (based on current stand ages) Kirtland’s warbler habitat on the Ottawa, 2008.

Jack Pine Age Class	Acres of Jack Pine Forest-wide	Acres of Jack Pine in MAs 4.1&4.2	Acres of Jack Pine in Baraga Plains area
Unsuitable for KW	13,829	9,909	~3,031
Suitable for KW (6-17 years old)	2,604	1,980	~575
Total	16,433*	11,889	3,606

* Some acres are in areas that will no longer be treated (e.g., wilderness areas) and will likely convert to another cover type.

At the time of this writing, there are approximately 16,433 acres of jack pine stands on the Ottawa (see Table 11). Of this total, 14,122 acres are considered to be in an age class that is unsuitable for KW habitat requirements. Additionally, most of the 2,311 acres that are in a suitable age class (6-17 years of age) are relatively small stands that are patchily distributed across the Ottawa (see Figure 8). Therefore, there are no areas on the Ottawa that would be

considered prime KW habitat at this time. However, the best potential areas have been identified and will be surveyed beginning in June of 2009, during the state-wide KW census efforts.

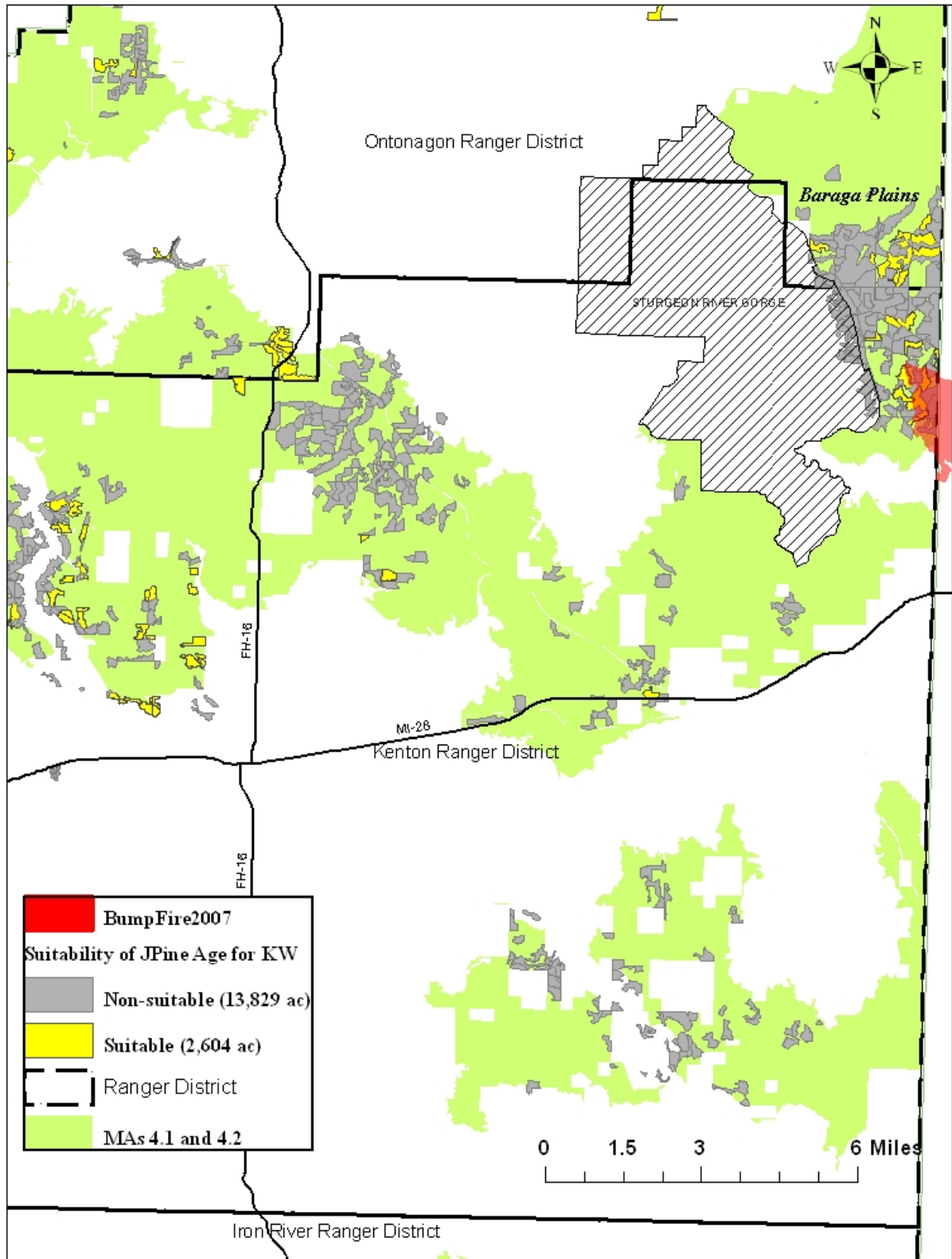


Figure 7 Map of northeast corner of Ottawa showing areas of jack pine concentration and potential Kirtland's warbler habitat areas

Annual Census Efforts and Results: The Kirtland's warbler population was first censused range-wide in 1951 by counting singing males (see Table 12). Total breeding adult population is assumed to be double the number of singing males counted. Not all areas with potential KW habitat have been surveyed since censusing began in 1951, so data is missing for many areas.

The population has been increasing steadily across its range with birds colonizing habitats outside the species core range. For example, nine males were heard in Wisconsin, including five mated pairs, and one male with a female was found in Ontario, Canada. It is expected that range-wide monitoring efforts will expand in the years to come as a result of recent reports of KW beyond its “normal” range.

Table 12. Singing male Kirtland’s warblers detected in Michigan, 1993-2008.

Year	MI Total	UP-wide	Baraga Plains State Land	Ottawa*
2008	1,803	34	0	1
2007	1,707	32	1	nc
2006	1,485	21	0	nc
2005	1,420	18	2	nc
2004	1,341	9	0	nc
2003	1,202	14	1	nc
2002	1,050	6	1	nc
2001	1,085	8	0	nc
2000	891	8	2	nc
1999	904	19	0	nc
1998	804	14	0	nc
1997	728	19	0	nc
1996	692	14	1	u
1995	765	7	1	nc
1994	633	3	1	nc
1993	485	2	0	nc

*nc = no census; u = unconfirmed report

Remote Habitat Area (RHA) Road Density

The RHA encompasses approximately 256,000 acres of the Ottawa comprised of parts of several management areas in the southern part of the Forest. The objective is to maintain a relatively low density of roads open to passenger vehicles, primarily to provide habitat for wildlife species that require some degree of remoteness from human activity. These species include, but are not limited to, the gray wolf, black bear, American marten, northern goshawk, red-shouldered hawk, and others.

The road density objective for the RHA is an average of less than or equal to one mile of road open to passenger vehicles (2- and 4-wheel drive) per square mile of NFS lands (mi/mi²).

Table 13. Road Density (open to passenger vehicles) in Remote Habitat Area.

Year	Open System Roads (mi)	Road Density (mi/mi²)
2006	272	.59
2007	253	.55
2008	251	.54

As depicted in Table 13, a 0.01 mi/mi² decrease in road density from 2007 is primarily a result of the recent road assessments conducted during the revision process for the Ottawa's MVUM. Changes to the 2008 MVUM in the RHA were primarily a result of implementing the decisions based upon NEPA analysis. These projects included the addition and removal of OML 2 roads from passenger vehicle access as well as road decommissioning. It is likely that more adjustments to the road density in the RHA will be made as the MVUM evolves over the next few years, including implementation of Forest management activities.

Off-Highway Vehicle Impacts to Wildlife

Motorized access by OHVs can impact wildlife species and wildlife habitats. These impacts can be measured indirectly by analyzing the total miles of roads and trails open to OHVs. Some species, such as wolves and black bears, seek more remote habitat, and may be impacted more than other species by higher open road densities. Since lower-standard roads (OML 1 and OML 2) are more likely to transect and impact wildlife habitat, and are most likely to be used most by OHVs, the focus of this discussion will be on the potential impacts from OHV use on the Ottawa. OHVs include motorcycles (dirt bikes), ATVs and utility vehicles (UTVs).

Potential negative impacts to wildlife habitat by OHVs can be characterized as habitat loss or a reduction in habitat quality. Cross-country OHV use on unauthorized routes can damage wetlands, can cause harm to wetland species, create habitat destruction, degrade water quality, and spread invasive species (plants, animals and disease-causing pathogens). (Stokowski and LaPointe, 2000). Typically, OHV effects to wildlife themselves are in the form of disturbance due to noise, exhaust and human interactions with wildlife, although some animals (white-tailed deer, for example) may become habituated to these vehicles over time.

Over the last 3 years, the Ottawa has changed the way OHV access is managed by revising the Forest Plan (2006), implementing the National Travel Management Rule (TMR), and publishing annually the Motor Vehicle Use Map (MVUM). Prior to 2006, the Forest allowed cross-country travel in most areas of the Forest. With the advent of the revised Forest Plan, TMR and MVUM, OHVs have been restricted to roads and trails designated as open for their use. Cross-country travel via OHV is now prohibited across the Ottawa, however, snowmobiles are still allowed to travel cross-country in most areas.

An accurate assessment of the roads and trails open to OHVs can now be queried from the MVUM database (see Table 14). The mileage of roads or trails open to OHVs that are under other jurisdictions (state, county, or private) that may traverse or may be near the Ottawa are not included in this report.

Status of Habitat: In a sense, quality of wildlife habitat can be inferred from the mileage of roads and trails open to OHVs compared to the total mileage of roads and trails on the Ottawa. Higher mileages can be translated to mean that there may be potentially more disturbance and degradation of wildlife habitat on the Ottawa. The inverse can be applied to lower mileages of roads and trails open to OHVs. The table below displays the miles of OML 1 roads (trails) open to OHVs and the miles of OML 2 roads open to OHVs

Table 14. OHV trail and road mileages, Ottawa National Forest, 2006-2008.

Motor Vehicle Use Map Data	2006	2007	2008
Miles of OML 1 roads (trails) open to OHVs	1,772	1,711	1,702
Miles of OML 2 Roads open to OHVs	659	638	636
Total Miles open to OHVs	2,431	2,349	2,338

Conclusions and Actions: Currently, OHV use on the Ottawa is restricted to designated OML 2 roads and motorized trails (OML 1 roads). There may be some OML 3 roads designated for OHV use in the future. The Ottawa will continue to monitor and adjust the amount and types of roads and motorized trails designated open to OHV use in the future through project interdisciplinary (ID) team analyses, ranger district reviews, and as a response to public comments.

Three years of data suggest there has been a very minor decrease in the number of miles of roads and trails open to OHVs. The change has probably been too slight to result in measurable changes to wildlife habitat or the amount of wildlife disturbance. We do not have data on the amount of OHV traffic across the Forest from year-to-year, which would be useful for this analysis. More rigorous monitoring of OHV use and effects to habitat would enable us to better determine potential impacts of OHVs on wildlife habitat on the Ottawa.

Minerals and Mineral Materials

Interest in mineral resources has increased substantially in the last two years, driven by high prices for minerals on the global market. Prices did decline during FY 2008, but there is still a higher level of exploration activity across the Ottawa than has been seen in recent history. The Forest Plan permits exploration activities in most areas (p. 2-10), especially where there is a potential to discover minerals of compelling domestic significance (as defined by U.S. Department of the Interior). Most of the mineral resources beneath the Ottawa are not owned by the federal government, but lie in private or State of Michigan ownership. The laws and regulations regarding exploration and exploitation of those minerals are highly variable, and dependant upon who owns them.

Federal Minerals: The Bureau of Land Management (BLM) has responsibility and authority over federally-owned hardrock minerals, including those lying under National Forest System lands. Hardrock minerals include base metals, precious metals, industrial minerals, and precious or semi-precious gemstones. Prospecting permits issued by BLM allow for exploration for leasable minerals on BLM-administered hardrock minerals.

Administrative responsibility for surface resources remains with the Forest Service, however. The Forest Service is responsible for making recommendations to the BLM regarding protection of surface resources.

Two applications for federally-owned hardrock minerals were received in FY 2008 for mineral materials, including nickel, copper, cobalt, platinum, palladium, and associated minerals. A September 2008 Ottawa decision memo authorized consent for mineral exploration activities, including up to 20 drill sites and 20 miles of geophysical surveys within 2,330 acres on the Ontonagon Ranger District (see Figure 8). Additionally, four prospecting permit applications were received in FY 2008 for federal hardrock minerals. The Ottawa did not complete the required NEPA analysis for these applications in 2008.

Private Minerals: Notification of the intent to conduct exploration of private minerals on NFS land was also received in 2008. The confirmed target mineral for the proposal was uranium. A February 2008 Ottawa decision authorized consent for mineral exploration, including up to 50 drill sites and 30 miles of geophysical survey on about 3,086 acres on the Bergland Ranger District (see Figure 8). Approximately nineteen miles of geophysical surveys and four drill sites were completed in FY2008.

A September 2008 Ottawa decision memo authorized consent for mineral exploration activities, including up to 15 drill sites and 13.5 miles of geophysical surveys on 1,920 acres on the Bergland Ranger District (see Figure 8). Approximately nine miles of geophysical surveys were completed and no drilling occurred related to this project during FY 2008.

Gravel Pits: The Ottawa has several gravel pits that provide for internal and external uses, such as free use by county road commissions and sales to private individuals. Gravel is used internally for maintaining Forest Service roads and trails.

Monitoring Methods: No monitoring occurred for federal minerals. No exploration occurred on federal minerals, nor are there any currently issued prospecting permits for federal minerals.

Monitoring of exploration drilling and geophysical surveys for privately-held minerals in the Matchwood area did occur. Monitoring active drill sites resulted in the observation that projects were being implemented in accordance with the permit or letter of concurrence. No notices of non-compliance were issued. Monitoring for multiple seasons/years after reclamation would continue to document the effectiveness of stipulations and administration after the projects are complete.

Monitoring of gravel pits occurs at the District level. There was an effort to document which gravel pits have large weed infestations. The Ottawa developed a map for referral when searching for potential new gravel pits. A review of existing pits in Wild and Scenic River Corridors was conducted in FY 2008, with multiple specialists visiting several, mostly inactive gravel pits, and providing management recommendations that ranged from precluding Off-Highway Vehicle use to no change.

Mineral Projects on the Ottawa National Forest, Fiscal Year 2008

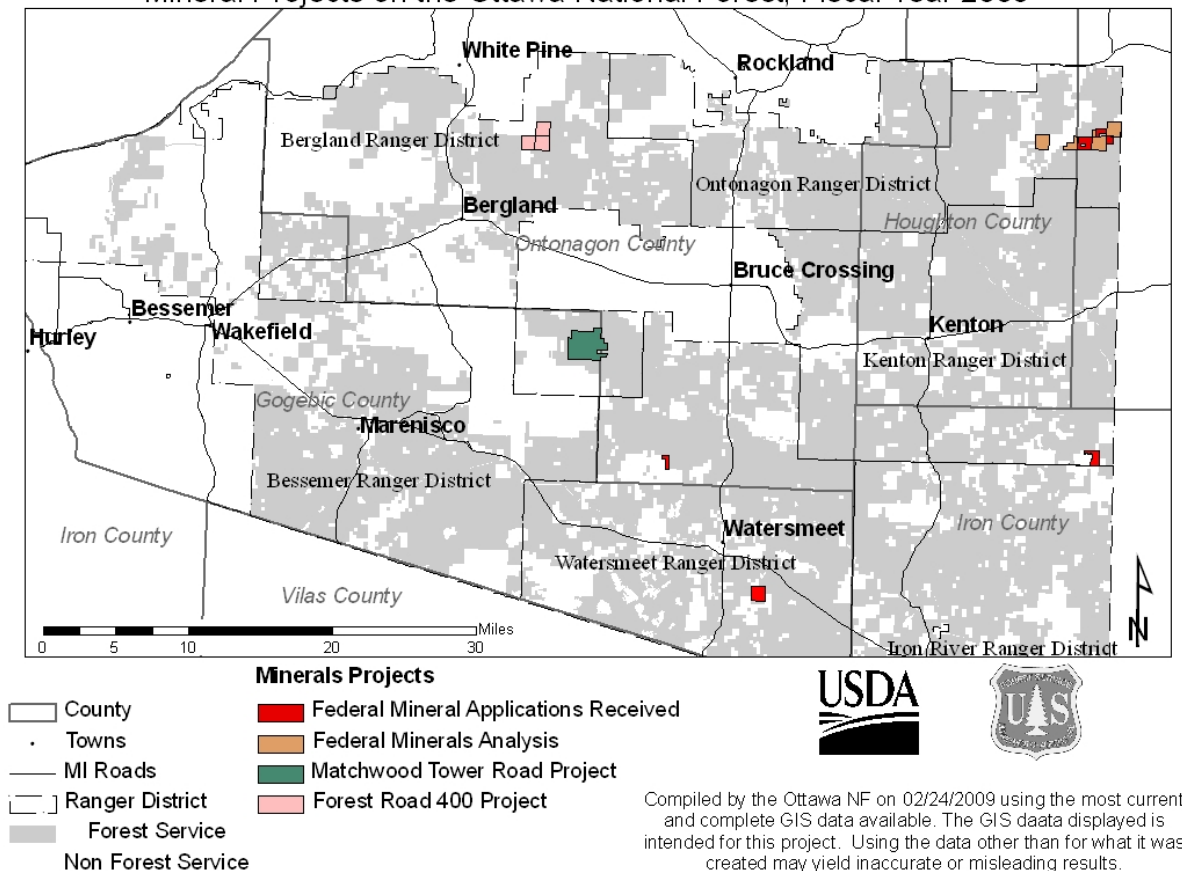


Figure 8 Locations of requests for federal and private mineral exploration permits

Summary: A prospecting permit was not issued by the BLM in FY 2008 for federal minerals and there are no open prospecting permits on the Ottawa. Currently, there are two pending prospecting permits, totaling 2330 acres; four new prospecting permit applications received, totaling 2160 acres; and no lease applications were submitted.

Permit administration for private minerals by Ottawa staff resulted in the permittee following their plan of operations, including complying with permit stipulations required by the Forest Service. Currently, there is one operating plan received, two operating plans approved, and two operating plans administered

No gravel exploration occurred in FY 2008. A total of ten gravel pit permits were issued in FY2008, totaling approximately 700 cubic yards in pit run material and approximately 100 cubic yards of rip rap. Internal use totaled approximately 4,400 cubic yards which were used for timber sale administration or road and trail maintenance. Internal production was approximately 10,000 cubic yards, which occurred at the Pit Lake pit on the Watersmeet Ranger District.

Land Adjustment

Land Acquisition: On June 19, 2008, deeds were recorded for the acquisition of 2000 acres within and immediately adjacent to the Sturgeon River Gorge Wilderness. This acquisition greatly facilitated the management of the wilderness, which was accessed through the subject property. The Forest Service can now manage features such as the trail, the parking areas, and the visual overlook known as the Bear’s Den Overlook. With this property now in public ownership, the threat of invasive species and fire can be better managed. This acquisition substantially facilitated the landline survey program by eliminating the need to establish 81 section corners and 11 miles of boundary line at a savings \$110,000. Approximately 400 acres of wetlands and 600 acres of floodplain are protected from disturbance and/or development with this acquisition. The acquired parcel contained approximately 12.9 miles of the Sturgeon River, a Congressionally designated Wild and Scenic River. Having this river in public ownership eliminates the threat of development within the river corridor.

Land Exchange: The McCosker Land Exchange included forty acres of Federal land for forty acres of non-Federal land, with the deed being recorded on August 10, 2007. This acquisition secured public ownership of a section of snowmobile trail that receives extensive use and connects with other state trails. The subject property is within the Middle Branch of the Ontonagon River, a river designated as a Recreational River under the Wild and Scenic Rivers Acts. Public ownership helps protect the river corridor from future development. The Forest Service’s land survey program benefited from this exchange by consolidating Federal ownership and eliminating the need for one mile of boundary line.

Fire Suppression

The Forest Plan contains detailed guidance on the use of fire as a management tool and the suppression of wildfire. Furthermore, the Ottawa has additional guidance, in the form of a Fire Management Plan, which is the fire managers’ tool for implementing Forest Plan direction on-the-ground. This monitoring question is directed at determining if the Forest Service suppressed fires with the appropriate level of effort, relative to the resource values threatened by the wildfire. Table 16 describes all the wildfires that occurred across the geographic area in 2008 for which the Forest Service has primary suppression responsibility, including the non-federal lands located to the west of the Forest’s proclamation boundary over to the Montreal River (i.e., Wisconsin border).

Table 15. Summary of FY 2008 Wildland Fires Reported by the Ottawa

Fire #	MA	Ownership/Protection	Size (Acres)	Was fire suppressed?	Wildland Fire Use?	Primary fire carrier
1	N/A	Private/FS	1	Yes	No	Grass
2	N/A	Private/FS	.25	Yes	No	Grass/Brush
3	N/A	Private/FS	.25	Yes	No	Grass
4	4.1a	FS/FS	.25	Yes	No	Pine Litter
5	2.2	FS/FS	3	Yes	No	Timber Litter

Fire #	MA	Ownership/ Protection	Size (Acres)	Was fire suppressed?	Wildland Fire Use?	Primary fire carrier
6	3.1a	FS/FS	.25	Yes	No	Grass
7	9.3	Private/FS	.25	Yes	No	Grass
8	9.3	Private/FS	.25	Yes	No	Grass
9	9.3	Private/FS	.25	Yes	No	Grass
10	2.1	FS/FS	.10	Yes	No	Grass
11	9.3	Private/FS	.25	Yes	No	Timber Litter/Brush
12	2.2	FS/FS	.25	Yes	No	Grass
13	2.1	FS/FS	2	Yes	No	Grass
14	2.1	FS/FS	3	Yes	No	Grass
15	5.3	FS/FS	.10	Yes	No	Pine Litter
16	5.3	FS/FS	.10	Yes	No	Pine Litter
17	3.1a	Private/FS	.25	Yes	No	Grass
18	2.1	FS/FS	.10	Yes	No	Grass

Note: None of the wildfires resulted in financial losses due to permanent resource damages (e.g. loss of commercial timber or structures). The primary fuel carrier of the fire is indicated.

None of these fires were substantial, and were readily suppressed with hand crews and tanker trucks applying water. The appropriate level of response, relative to the resources threatened, did not warrant any additional resources. In no instance was human life threatened, nor was valuable property in the form of structures threatened. Additionally, threatened, endangered and sensitive resources were not threatened by any of these fires. In conclusion, it appears the fire suppression tactics used were appropriate to the low level of threat posed by these fires.

Effectiveness of Road Closure Devices

There are a variety of reasons to close Forest Service roads to passenger vehicle traffic including protecting the road surface from rutting, protecting of rare species, and preventing of damage to streams and wetlands. The Ottawa uses a variety of closure devices, including earthen berms, large boulders and gates. Overall, the Ottawa's closure devices appear to be successful most of the time. After use during timber sales, over two-thirds of the OML 1 roads are closed. However if someone wishes to access a road on the Ottawa, any closure device can be compromised. On average, 10 to 15 road closures are repaired or replaced each year due to malicious damage caused by unauthorized motor vehicle use. See also Monitoring Item 5c above for related information.

Findings

Monitoring activities and eventual evaluation of the data in this and future reports will make it possible to chart progress toward the direction outlined in the Forest Plan. The evaluation process determines whether the observed changes are consistent with Forest Plan desired future conditions, goals, objectives and what adjustments may be needed.

Monitoring activities in this year of Forest Plan implementation will contribute to more in-depth evaluation reports in future years. This report was accomplished through an interdisciplinary process involving Forest Service resource specialists and participation from many of our partners.

Future Monitoring Needs

Monitoring needs for 2009 have been outlined in the 2009 Monitoring Workplan (see Appendix 1 of this document for a listing of Monitoring Items we expect to address in the 2009 M&E Report). As in previous years, the 2009 Workplan was developed with an interdisciplinary review of the monitoring questions in the Forest Plan Monitoring Guide. The review included a prioritization of monitoring items included in each year's monitoring plan and uses criteria such as requirement by law or regulation, ecological significance, management significance or response to a key issue.

Preparers

The following Ottawa National Forest employees have contributed to this report.

Name	Title
Amy Amman	Soils Scientist
Lee Ann Atkinson	Forest Geologist
Steve Babler	Wildlife Biologist
Bill Baer	Recreation Program Manager
Brian Bogaczyk	Wildlife Biologist and Forest Planner
Susan Davis	Timber Resource Specialist
Dave Dillman	Wildlife Biologist
Sean Dunlap	Aquatic Ecologist
Joel Enking	Forest GIS Coordinator
Bob Evans	Wildlife Biologist
Chuck Frank	Lands Program Manager
Marlanea French-Pombier	Zone NEPA Coordinator
Holly Jennings	Forest Fisheries Biologist
Dean Karlovich	Fire Management Officer
Katie Koch	Integrated Resource Analyst
Sarah Mase	Forest Soil Scientist
Robin McCartney	Zone GIS Coordinator
Steve Plunkett	Wildlife Biologist
Stephen Popkowski	Forest Engineer
Mary Rasmussen	Tribal Liaison
Len Scuffham	Forest Silviculturist
Gayle Sironen	Zone GIS Coordinator
Dave Steffensen	Silviculturist
Susan Trull	Forest Botanist
Randall Wollenhaup	Wildlife Biologist

Literature Cited

- Dunlap, M. S. 2006. Ottawa National Forest Ephemeroptera-Plecoptera Trichoptera (EPT) Management Indicator Species Monitoring Protocol and Information Manual. 41 p.
- Dunlap, M. S. 2007. Exotic Earthworms on the Ottawa National Forest: Summary of findings from earthworm and botany surveys, 2002-2006. Unpublished Report, USDA Forest Service. Ironwood, MI. 8 pp.
- Johnson, Joe W.C.. Michigan State University, Kellogg Bird Sanctuary, Hickory Corners, MI 49060.
- Peters, B. and D. Lodge. 2007. Annual report covering 2006 cost share agreement (and including results from summer 2007). University of Notre Dame Environmental Research Center. 12 pp.
- Stokowski, P.A., and C.B. LaPointe. 2000. Environmental and Social Effects of ATVs and ORVs: An Annotated Bibliography and Research Assessment. School of Natural Resources, University of Vermont, Burlington, VT. 32pp.
- USDA Forest Service. 2005. Ottawa National Forest FY 2004 Monitoring & Evaluation Report.
- USDA, Forest Service. Ironwood, MI. 100 pp.
- USDA Forest Service (Ruiggiero), 2005. Broadscale Assessment of the Ottawa National Forest Relative to Canada Lynx.
- USDA Forest Service. 2008. Ottawa National Forest Motor Vehicle Use Map Database. Ottawa National Forest, Ironwood, MI.
- USDA Forest Service-Eastern Region. 2002. Conservation Assessment for Trumpeter Swan (*Cygnus buccinator*). USDA, Forest Service. Milwaukee, Wisconsin. 27 pp.
- .

Appendix 1 – Schedule for Forest Plan Monitoring and Evaluation

Monitoring Item #¹	Monitoring Frequency	Evaluation Frequency	FY Scheduled	FY Last Accomplished	Monitoring Question
01	Annually	Annually	2008	2007	How do actual outputs and services compare to those outputs and services projected in the 2006 Forest Plan?
02	5 years	5 years	2010	n/a	How close are actual costs compared to projected costs?
03	3 to 5 years	3 to 5 years	2009	n/a	To what extent do output levels and the mix of sawtimber and pulpwood compare to those levels projected?
04	Annually	Annually	2008	2007	Are insect and disease population levels compatible with objectives for restoring or maintaining healthy forest conditions?
05a	Annually	1 to 5 years	2008	n/a	What are the effects of OHVs on the physical and social environment?
05b	Annually	1 to 5 years	2008	n/a	How effective are forest management practices in managing OHV use?
05c	Annually	1 to 5 years	2008	n/a	To what extent are road and trail closures effective in prohibiting unauthorized motor vehicle use?
06	Annually	Annually	2008	2007	Are harvested lands adequately restocked after 5 years?
07a	5 years	5 years	2010	n/a	To what extent are timber management activities occurring on lands suited for timber production?
07b	10 years	10 years	2015	n/a	To what extent have conditions or information changed the classification of lands "not suited" for timber production to "suitable" for timber production?
08	Years 5 and 10	Years 5 and 10	2011	n/a	To what extent and under what circumstances are clearcuts, and other openings created by even-aged management, exceeding 40 acres?
09	1 to 5 years	1 to 5 years	2008	2006	Are the effects of Forest management, including prescriptions, resulting in significant changes to productivity of the land?
10a	Annually	1 to 5 years	2008	2007	To what extent are forest management activities providing habitat for MIS (EPT).
10b	Annually	1 to 5 years	2008	2007	To what extent are forest management activities providing

Monitoring Item #¹	Monitoring Frequency	Evaluation Frequency	FY Scheduled	FY Last Accomplished	Monitoring Question
					habitat for MIS (ruffed grouse).
10c	Annually	1 to 5 years	2008	2007	To what extent are forest management activities providing habitat for MIS (American marten).
10d	Annually	1 to 5 years	2008	2006	To what extent are forest management activities providing habitat for MIS (cutleaf toothwort).
11	5 years	5 years	2012	2007	To what extent does the Forest emphasize agency, tribal and public involvement and intergovernmental coordination with federal, state, county governments and agencies?
12a	Annually	1 to 5 years	2008	2007	To what extent is Forest management contributing or responding to non-native invasive plant species?
12b	Annually	1 to 5 years	2008	2007	To what extent is Forest management contributing or responding to non-native invasive animal species?
13	1 to 5 years	1 to 5 years	2009	2007	What amount of road routes and recreation trails are designated open for OHV riding and provide connections to other public trails?
14	1 to 5 years	1 to 5 years	2009	2007	To what extent is the Forest providing a range of motorized and nonmotorized recreation opportunities that incorporate diverse public interests yet achieve applicable management area objectives and desired conditions?
15	1 to 5 years	1 to 5 years	2009	2007	To what extent are Forest management activities in semi-primitive nonmotorized management areas in alignment with the Recreation Opportunity Spectrum Objectives?
16	5 years	5 years	2012	2007	To what extent is Forest management contributing to the preservation, evaluation of and education for heritage resources?
17	Annually	Annually	2008	2007	Monitor implementation of the 2006 Forest Plan with respect to tribal treaty rights applicable on the Ottawa with respect to the tribal MOU.
18	1 to 5 years	1 to 5 years	2011	2007	To what extent is wilderness management contributing to improvement or preservation of wilderness character and values?

Monitoring Item #¹	Monitoring Frequency	Evaluation Frequency	FY Scheduled	FY Last Accomplished	Monitoring Question
19	5 years	5 years	2012	2007	To what extent are forest management activities restoring vegetation composition and spatial landscape patterns and moving toward desired conditions at the Forest, management area and other appropriate landscape scales?
20	5 years	5 years	2011	2006	To what extent are existing and potential old growth forest conditions being classified consistent with management area objectives?
21	5 years	5 years	2010	n/a	To what extent are permanent upland openings being created and maintained to move towards the desired condition at the Forest, management area and landscape scale?
22	5 years	5 years	2010	n/a	To what extent are northern hardwoods being managed to work toward the desired mix of even-aged and uneven-aged stands?
23	5 years	5 years	2011	2006	To what extent are aspen forest type acres being maintained through regeneration activities to meet Forestwide and management area objectives?
24	5 years	5 years	2010	n/a	To what extent are long-lived conifer forest types being increased or maintained through regeneration activities to meet Forestwide and management area objectives?
25	5 years	5 years	2010	n/a	To what extent are short-lived conifer forest types being maintained through regeneration activities to meet Forestwide and management area objectives?
26	5 years	5 years	2010	n/a	To what extent is natural regeneration favored over artificial reforestation to meet Forestwide and management area objectives?
27	1 to 5 years	1 to 5 years	2010	n/a	To what extent is forest management maintaining or restoring conditions that result from or emulate natural ecological patterns and processes such as fire, wind, flooding, and insect and disease outbreaks?
28	1 to 5 years	1 to 5 years	2010	n/a	To what extent is forest management utilizing the Ecological Classification System and its components to implement ecosystem based management?

Monitoring Item #¹	Monitoring Frequency	Evaluation Frequency	FY Scheduled	FY Last Accomplished	Monitoring Question
29	1 to 5 years	1 to 5 years	2011	2007	To what extent is forest management affecting soil quality?
30	1 to 5 years	1 to 5 years	2010	n/a	To what extent is forest management affecting riparian and wetland ecosystems?
31	1 to 5 years	1 to 5 years	2009	n/a	To what extent has management maintained or restored the diversity and abundance of native aquatic flora and fauna in streams and lakes in a manner consistent with the capability of the water body?
32	1 to 5 years	1 to 5 years	2009	n/a	To what extent are the key terrestrial and aquatic habitat components (e.g., soft mast, hard mast, snags, down woody material, low dense conifer regeneration) being provided?
33a	5 years	1 to 5 years	2009	n/a	To what extent is forest management providing ecological conditions to maintain viable populations of native and desired non-native species? (Botany)
33b	Annually	1-5 years	2010	2007	To what extent is forest management providing ecological conditions to maintain viable populations of native and desired non-native species? (Breeding Bird Census)
33c	Annually	1-5 years	2011	2007	To what extent is forest management providing ecological conditions to maintain viable populations of native and desired non-native species? (Frogs)
33d	5 years	5 years	2009	n/a	To what extent is forest management providing ecological conditions to maintain viable populations of native and desired non-native species? (Bobcat)
34a	1 to 5 years	1 to 5 years	2008	n/a	To what extent is forest management contributing or responding to the conservation of species of viability concern (such as Regional Forester sensitive Species) and moving toward desired habitat conditions for these species? (Botany)
34b	5 years	5 years	2009	2002	To what extent is forest management contributing or responding to the conservation of species of viability concern (such as Regional Foresters Sensitive Species) and moving toward desired habitat conditions for these species? (black-backed woodpecker/spruce grouse)

Monitoring Item #¹	Monitoring Frequency	Evaluation Frequency	FY Scheduled	FY Last Accomplished	Monitoring Question
34c	Annually	5 years	2012	2007	To what extent is forest management contributing or responding to the conservation of species of viability concern (such as Regional Foresters Sensitive Species) and moving toward desired habitat conditions for these species? (black-throated blue warbler)
34d	Annually	1-5 years	2009	2007	To what extent is forest management contributing or responding to the conservation of species of viability concern (such as Regional Foresters Sensitive Species) and moving toward desired habitat conditions for these species? (common loon)
34e	Annually	1-5 years	2009	2007	To what extent is forest management contributing or responding to the conservation of species of viability concern (such as Regional Foresters Sensitive Species) and moving toward desired habitat conditions for these species? (Raptors)
34f	Annually	1-5 years	2009	2007	To what extent is forest management contributing or responding to the conservation of species of viability concern (such as Regional Foresters Sensitive Species) and moving toward desired habitat conditions for these species? (Turtles)
34g	Annually	1-5 years	2012	2007	To what extent is forest management contributing or responding to the conservation of species of viability concern (such as Regional Foresters Sensitive Species) and moving toward desired habitat conditions for these species? (Osprey)
35	1 to 5 years	1 to 5 years	2008	2007	To what extent is forest management contributing to the conservation of threatened and endangered species and moving toward desired habitat conditions and populations trends for these species?
36	1 to 5 years	1 to 5 years	2008	2007	To what extent is forest management affecting the density of open roads within the Remote Habitat Area, and moving toward the Forest density objective of < 1.0 miles/square mile?

Monitoring Item #¹	Monitoring Frequency	Evaluation Frequency	FY Scheduled	FY Last Accomplished	Monitoring Question
37	1 to 5 years	1 to 5 years	2008	2007	To what extent is forest management contributing to the development and maintenance of foraging and denning habitat, and connectivity of habitats for Canada lynx?
38	1 to 5 years	1 to 5 years	2008	2007	To what extent are OHVs producing impacts to wildlife or wildlife habitats?
39	1 to 5 years	1 to 5 years	2008	2007	To what extent is the Forest providing minerals and mineral materials to help support economic growth?
40	1 to 5 years	1 to 5 years	2008	2007	To what extent has land ownership adjustment facilitated forest management activities?
41	1 to 5 years	1 to 5 years	2009	2007	To what extent is forest management meeting hazardous fuels objectives?
42	1 to 5 years	1 to 5 years	2009	2007	To what extent is wildland fire (natural and prescribed) used to maintain or mimic natural processes, and/or restore natural processes and functions to ecosystems?
43	1 to 5 years	1 to 5 years	2008	n/a	How have fire suppression tactics been implemented on the Forest relative to the threat posed to human life, property, or threatened resources?
44a	1 to 5 years	1 to 5 years	2009	2007	To what extent are the unneeded roads being decommissioned?
44b	1 to 5 years	1 to 5 years	2008	n/a	To what extent are road closures on decommissioned roads effective in prohibiting unauthorized motor vehicle use

¹The information in this table was taken from both Chapter 4 of the Forest Plan and the 2008 Monitoring Guide.

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 USDA, Director, Office of Civil Rights, Room 326 W. Whitten Building, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.