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# Fiscal Year 2009 Monitoring and Evaluation Report



O·T·T·A·W·A  
NATIONAL FOREST

*Caring for the Land and Serving People*

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# FY 2009 MONITORING AND EVALUATION REPORT

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## 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.



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.

**Figure 1.** Vicinity Map

To determine the efficacy of a Forest Plan, the National Forest Management Act (NFMA) regulations (36 CFR 219) require regularly scheduled monitoring and evaluation. This report is the Ottawa's annual compilation to satisfy those regulations. This collection of field reviews and database queries gives us and our interested public a sense of how we are doing, and enables us to make mid-course corrections as we implement the Forest Plan.

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, and 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 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 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 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 and 2008 M&E Reports. Few monitoring items were evaluated for effectiveness or trends in either the 2007 or 2008 M&E Reports, 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 2009 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 2006 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 staffs 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.usda.gov/>).

Using the Monitoring Guide, the FY 2009 Monitoring Work Plan (see Table 1) 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 2009; therefore the identification (ID) numbers shown in Table 1 are not continuous, but they are sequential.

## Monitoring Activities for FY 2009

Table 1 displays the monitoring activities that were completed for FY 2009. Appendix 1 of this document contains the complete schedule, by year, of all the Monitoring Items that are scheduled to be reported. 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 in the future.

**Table 1. Monitoring Items addressed in FY 2009 Monitoring and Evaluation Report.**

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
03	To what extent do output levels and the mix of sawtimber and pulpwood compare to levels projected in the 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
05b	How effective are the Forest's management practices in managing OHV use?	Recreation Coordinator
05c	To what extent are road and trail closures effective in prohibiting unauthorized motor vehicle use?	Recreation Coordinator
06	Are harvested lands adequately restocked after 5 years?	Supervisory Forester
10a	To what extent are Forest management activities providing habitat for Management Indicator Species (EPT)?	Aquatic Biologist

<b>Monitoring Item ID</b>	<b>Monitoring Question</b>	<b>Responsibility</b>
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?	Fish Biologist
13	What amount (mileages) of roads and trails are designated open for OHV riding, and provide connections to other public trails?	Recreation Coordinator
14	To what extent is the Forest providing a range of motorized and non-motorized recreation opportunities that incorporate diverse public interests, yet achieve Management Area objectives and desired conditions?	Recreation Coordinator
15	To what extent are Forest's management activities in semi-primitive non-motorized areas in alignment with the Recreation Opportunity Spectrum Objectives?	Recreation Coordinator
17	Is implementation of the 2006 Forest Plan compatible with tribal treaty rights with respect to the tribal Memorandum of Understanding?	Tribal Liaison
31a <sup>1</sup>	To what extent has management maintained or restored the diversity and abundance of native aquatic flora in streams and lakes in a manner consistent with the capability of the water body?	Botanist
31b	To what extent has management maintained or restored the diversity and abundance of native aquatic flora in streams and lakes in a manner consistent with the capability of the water body?	Fish Biologist
32 <sup>1</sup>	To what extent are key terrestrial and aquatic habitat components (e.g. soft mast, hard mast, snags, down woody debris, dense conifer thickets) being provided?	Wildlife Biologist
33d <sup>1</sup>	To what extent is forest management providing ecological conditions to maintain viable populations of native and desired non-native species? (Bobcat)	Wildlife Biologist
34a <sup>1</sup>	To what extent is Forest management contributing or responding to the conservation of plants of viability concern (such as Regional Forester Sensitive Species) and moving toward desired habitat conditions for these plant species?	Botanist

Monitoring Item ID	Monitoring Question	Responsibility
34b <sup>1</sup>	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 and Spruce Grouse)	Wildlife Biologist
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? (Common Loon)	Wildlife Biologist
34e	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? (Forest Raptors)	Wildlife Biologist
34f <sup>2</sup>	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)	Wildlife Biologist
35 <sup>3</sup>	To what extent is Forest management contributing to conservation of federally-threatened or endangered species and moving toward desired habitat conditions for these species? (Kirtland's warbler).	Wildlife Biologist
41	To what extent is forest management meeting hazardous fuels objectives?	Fire Management Officer
42	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?	Fire Management Officer
44a	To what extent are unneeded roads being decommissioned?	Forest Engineer

<sup>1</sup> The Ottawa does not have sufficient data to address these monitoring questions at this time. See Appendix 1 for year when each monitoring question is scheduled for analysis.

<sup>2</sup> The Ottawa has postponed addressing this question due to a thorough analysis of 6 years of wood turtle data that is currently under contract. This information will be disclosed in the FY 2010 M&E Report.

<sup>3</sup> The Ottawa opted to add this monitoring question due to high public interest and significant new information (discovery of breeding pairs).

## Comparison of Projected and Actual Outputs and Services

The Forest Plan determined that 488,100 acres of land are suitable for timber production, which is about half of the nearly 1 million acres that comprise the Ottawa. The Forest Plan also set the allowable sale quantity (ASQ) of wood products at 14.6 million cubic feet (MMCF) per year or 90.1 million board feet (MMBF) per year for the first decade (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. Wood volume sold from lands not suitable for timber production does not count toward ASQ.

The average volume sold over the last four years, approximately 7.0 MMCF (or 44.2 MMBF), is about 49% of the average annual ASQ. The volume sold in 2009 (6.0 MMCF or 38.8 MMBF) is slightly below the four year average (see Table 2). Reduced budgets have been largely responsible for the lower amount of volume sold.

**Table 2. FY 2009 actual wood volume sold, by product type, on the Ottawa**

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
2009	5.2	1.0	33.6	5.0	38.8	6.0
Average	6.2	1.1	38.0	5.9	44.2	7.0

The volume and number of acres harvested depends on the number of sales and volume under contract, the capability of the operators, market conditions, and operating conditions. The volume harvested in 2009 decreased (see Table 3). Poor markets and a reduced demand for wood products were largely responsible for the decreased harvest. The four year average volume harvested is less than the four year average volume sold.

**Table 3. FY 2009 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
2009	4.0	0.7	25.5	4.0	29.5	4.7
Average	4.9	0.9	29.5	4.5	34.4	5.4

Data regarding number of acres harvested was obtained from the Forest Activity Tracking System (FACTS) database. About 3,700 acres were harvested on the Ottawa in 2009 (see Table 4). This is approximately 1,400 acres less than in 2008 and about 700 acres less than the four year average. The four year average of acres harvested is about 37% of the acres estimated in the Forest Plan. Less than one percent of the acreage determined suitable for active timber production in the Forest Plan was harvested in 2009 on the Ottawa.

**Table 4. FY 2009 and first decade actual harvest acres compared to the Forest Plan's estimated average annual timber harvest practices.**

<b>Cutting Method</b>	<b>Forest Plan Estimated Acres</b>	<b>FY 2006 Acres</b>	<b>FY 2007 Acres</b>	<b>FY 2008 Acres</b>	<b>FY 2009 Acres</b>	<b>FY 2006-2009 Average Harvest Acres</b>	<b>FY 2006 - 2009 Avg. % of Forest Plan Estimate</b>
Selection	6,700	2,284	3,024	2,190	1,331	2,207	33
Thinning	3,100	1,265	1,318	1,506	1,219	1,327	43
Shelterwood	400	11	249	120	141	130	33
Clearcutting	1,900	307	516	1,292	1,019	784	41
<b>Totals</b>	<b>12,100</b>	<b>3,867</b>	<b>5,107</b>	<b>5,108</b>	<b>3,710</b>	<b>4,448</b>	<b>37</b>

## **How do outputs and product mix of sawtimber and pulpwood compare to Forest Plan projections?**

### **Timber Outputs and Product Mix**

The forest products industry provides needed forest products to the Lake States Region and beyond, while providing jobs and maintaining forest health. The amount of timber harvested and the species and products harvested influences the total number of jobs and income. The Ottawa provides about 15% of the timber products entering the forest products industry in the western Upper Peninsula (Forest Plan FEIS, page 3-85).

Over the four year period between fiscal years 2006 and 2009 the average annual timber harvest on the Ottawa was 7.1 MMCF (million cubic feet) or 44.2 MMBF (million board feet). This is about 49% of the projected average annual harvest in the Forest Plan. The total sawtimber harvested was about 42% of the projected amount, while the amount of pulpwood harvested was about 50% of the projected amount. Approximately 86% of the total volume harvested was pulpwood and 14% was sawtimber. The Forest Plan estimated that 82% of the volume in the first decade would be pulpwood and 18% would be sawtimber. The total volume sold in FY 2009 is below the four year average. Limited budgets to plan and prepare timber sales are largely responsible for the lower volumes sold than those projected in the Plan. The four year period was also a period when demand for, and prices for, timber products were unusually low. Table 5 below displays volume of timber sold on the Ottawa compared to projected annual harvest rates in the Forest Plan. Note the volume sold is itemized by year and by species/product group.

**Table 5. Timber volume sold, by year, by species/product group, on the Ottawa, FYs 2006 – 2009.**

Species/ Product	Forest Plan Projected Average Annual Harvest		Volume Sold FY 2006		Volume Sold FY 2007		Volume Sold FY 2008		Volume Sold FY 2009		Average Volume Sold FY's 2006-2009		
	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF	MMCF	MMBF	% of Plan Level
Hardwood Sawtimber	1.7	10.5	0.5	2.7	0.6	3.4	0.4	2.2	0.3	1.9	0.5	2.5	28%
Pine Sawtimber	0.8	4.9	1.1	6.2	0.2	1.0	0.4	2.3	0.5	2.9	0.6	3.1	72%
Other Softwood Sawtimber	0.2	1.2	0.2	1.1	0.1	0.4	0.0	0.2	0.1	0.4	0.1	0.5	49%
<b>Sawtimber Total</b>	<b>2.7</b>	<b>16.6</b>	<b>1.8</b>	<b>10.0</b>	<b>0.9</b>	<b>4.8</b>	<b>0.9</b>	<b>4.8</b>	<b>1.0</b>	<b>5.2</b>	<b>1.1</b>	<b>6.2</b>	<b>42%</b>
Aspen	2.8	17.3	2.8	17.7	1.5	9.5	1.6	10.0	1.3	8.0	1.8	11.3	64%
Hardwood Pulpwood	6.1	37.7	3.4	21.3	2.8	17.7	2.4	15.3	2.7	17.0	2.8	17.8	46%
Pine Pulpwood	1.7	10.5	1.0	6.4	0.6	3.8	1.2	7.7	1.2	7.3	1.0	6.3	59%
Other Softwood Pulpwood	1.3	8.0	1.0	6.1	0.2	1.6	0.2	1.3	0.2	1.3	0.4	2.6	31%
<b>Pulpwood Total</b>	<b>11.9</b>	<b>73.5</b>	<b>8.2</b>	<b>51.6</b>	<b>5.1</b>	<b>32.6</b>	<b>5.4</b>	<b>34.2</b>	<b>5.3</b>	<b>33.6</b>	<b>6.0</b>	<b>38.0</b>	<b>50%</b>
<b>Totals</b>	<b>14.6</b>	<b>90.1</b>	<b>10.0</b>	<b>61.6</b>	<b>6.0</b>	<b>37.3</b>	<b>6.3</b>	<b>39.0</b>	<b>6.3</b>	<b>38.8</b>	<b>7.1</b>	<b>44.2</b>	<b>49%</b>

## Payment in Lieu of Taxes and 25% Funds

Two types of payments are made each year to local units of government to partially offset funding shortfalls from untaxed National Forest lands in Michigan – Payment in Lieu of Taxes (PILT) payments and 25% Funds.

Payment in Lieu of Taxes (PILT) are federal payments to counties and local school districts that help offset losses in property taxes due to nontaxable Federal lands within their boundaries. The PILT program provides a per-acre payment based on annual congressional appropriations and a formula that incorporates population, income from other payments (such as the 25% fund) and other factors. The acreage subject to PILT payments is termed entitlement acres, which refers to the number of acres that were on the applicable county tax rolls when the lands were originally acquired by the federal government. The counties that have the most acres of National Forest land within their boundaries, (such as Gogebic and Ontonagon counties) generally receive the highest PILT fund payments. Between fiscal years 2006 and 2009, PILT payments to Michigan counties from the Ottawa averaged \$1.3 million annually.

In addition to PILT funds, local governments also receive 25% funds. The Bankhead-Jones Farm Tenant Act of 1937 authorizes the Forest Service to pay local counties, which have National Forest land within their boundaries, 25% of applicable Forest Service annual revenues. Payments are based on receipts from timber sales, campground fees, special use permit fees, and leases from minerals, oil, and gas. Local governments can use these funds for schools or road maintenance and construction.

On the Ottawa, annual fluctuation in 25% Fund payments is primarily due to fluctuations in the volume of timber harvested, the value of the timber harvested, and the location of the timber sales in a given year. The Secure Rural Schools and Community Self-Determination Act of 2000 provides counties with options on how they receive their payments. The act was amended and reauthorized for fiscal years 2008 through 2011. Between fiscal years 2006 and 2009, the 25% payments to Michigan counties from the Ottawa averaged \$1.2 million annually (see Table 6). PILT and 25% fund payments together from the Ottawa averaged over \$2.5 million annually (see Table 7).

**Table 6. FY 2009 Payments to counties within the Ottawa’s boundary.**

<b>County</b>	<b>PILT Fund</b>	<b>25% Fund</b>	<b>Total Payment</b>
Baraga	\$82,543	\$39,618	\$122,161
Gogebic	\$519,445	\$706,241	\$1,225,686
Houghton	\$228,278	\$137,668	\$365,946
Iron	\$317,320	\$157,125	\$474,445
Marquette	\$37,892	\$31,994	\$69,886
Ontonagon	\$482,861	\$572,163	\$1,055,024
<b>Total</b>	<b>\$1,668,339</b>	<b>\$1,644,809</b>	<b>\$3,313,148</b>

**Table 7. Average annual payments to counties located within the Ottawa’s boundary, PILT and 25% Fund, FY 2006 to FY 2009.**

<b>FY 2006 – FY 2009 Average Annual Payment</b>					
<b>County</b>	<b>Acres</b>	<b>PILT Fund</b>	<b>25% Fund</b>	<b>Total Payment</b>	<b>Payment per Acre</b>
Baraga	45,953	\$60,849	\$38,431	\$99,280	<b>\$2.16</b>
Gogebic	313,712	\$410,129	\$461,693	\$871,821	<b>\$2.78</b>
Houghton	157,600	\$181,424	\$161,179	\$342,602	<b>\$2.17</b>
Iron	179,065	\$250,802	\$152,891	\$403,692	<b>\$2.25</b>
Marquette	12,211	\$30,069	\$21,560	\$51,629	<b>\$4.23</b>
Ontonagon	289,309	\$381,333	\$386,524	\$767,857	<b>\$2.65</b>
<b>Total</b>	<b>997,850</b>	<b>\$1,314,604</b>	<b>\$1,222,277</b>	<b>\$2,536,881</b>	<b>\$2.54</b>

## **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. Additionally, several years of drought have stressed trees, thereby making them more susceptible to other, secondary stressors like insects and disease outbreaks.

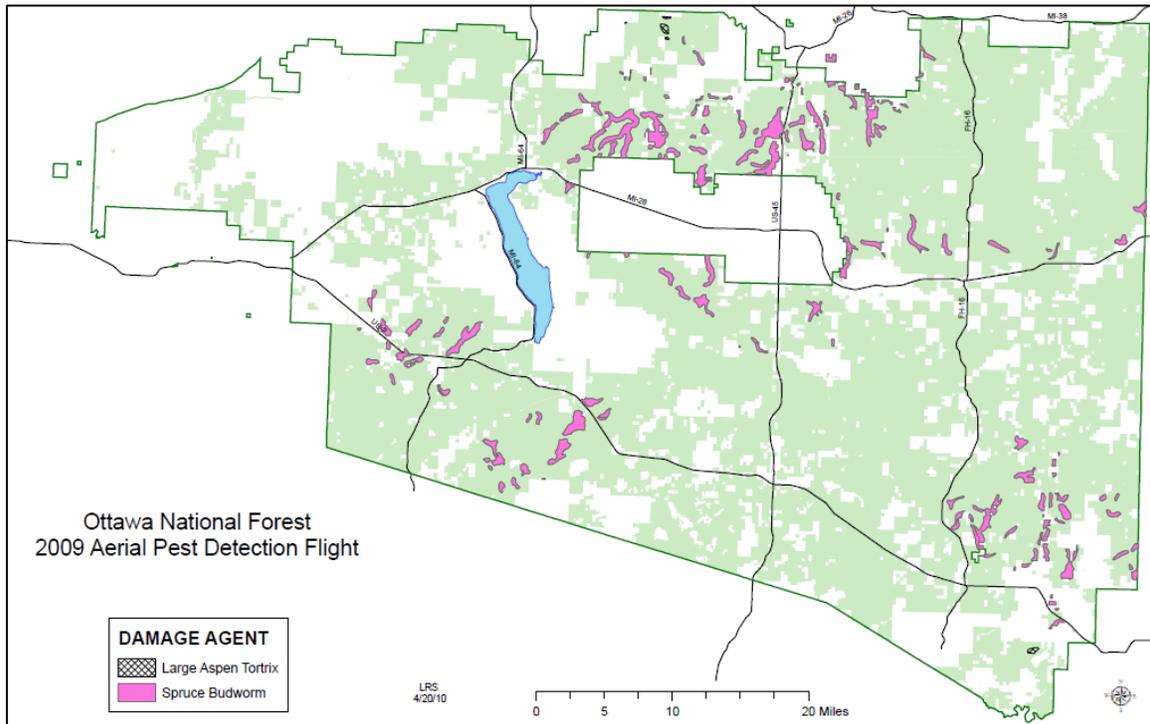
### **Current Infestations**

The Northern Research Station conducts annual aerial pest detection 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. See

Approximately 33,000 acres were defoliated on the Ottawa in 2009 by the spruce budworm and large aspen tortrix. See Figure 2 and Table 8 for more information about the results of the aerial survey.

Spruce budworm caused defoliation of white spruce and balsam fir on about 32,000 acres across the Ottawa in 2009, up substantially from about 3,000 acres in 2008. About two-thirds of the defoliation occurred within Wild and Scenic River corridors where stands are usually denser and management is limited. The largest blocks of spruce budworm defoliation occurred on the Bergland Ranger District in the Ridge Vegetation Management Project area, where some of those defoliated stands outside of river corridors have been proposed for treatments. Significant mortality also occurred in the central portion of the Iron River Ranger District and the south half of the Bessemer Ranger District. Most of the larger trees can survive a year or two of spruce budworm defoliation provided the same areas are not

repeatedly attacked in following years, and other agents do not also attack the weakened trees.



**Figure 3. Results of 2009 aerial pest detection flight.**

Large aspen tortrix occurred on over 400 acres, mainly south of Ontonagon on the boundary between the Bergland and Ontonagon Ranger Districts. One large patch also occurred on the south end of the Iron River Ranger District. Large aspen tortrix can cause a reduction in tree growth and occasional branch and top dieback, but trees generally will recover.

**Table 8. Acres of insect and disease agents on the Ottawa National Forest, FY 2009.**

Damage Agent	Damage	Severity	Host Name	Acres
Large Aspen Tortrix	Defoliation	Moderate	Aspen	400
Spruce Budworm	Defoliation	High	Spruce/Fir	8,000
Spruce Budworm	Defoliation	Moderate	Spruce / Fir	20,000
Spruce Budworm	Defoliation	Low	Spruce / Fir	4,200

Gypsy moth, an exotic insect from Asia and Europe, defoliated about 27,000 acres of aspen on the north end of the Ottawa in 2008. The gypsy moth population had been expanding on the Forest for the last several years, but declined substantially in 2009. Although there was still some gypsy moth activity observed on the Forest in 2009, none was detected during the aerial pest detection flight.

## 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, Minnesota, Missouri, Pennsylvania, Virginia, Wisconsin, as well as Ontario and Quebec Canada.

The EAB is commonly spread through the movement of infected firewood. The State of Michigan has a quarantine in effect that restricts the movement of firewood from EAB infected areas within the state to uninfected areas. Because of the EAB infection near Laurium in Houghton County, all of Houghton County (which includes a portion of the Ottawa) has been designated as a quarantined area. The quarantine prohibits the movement of firewood within Houghton County anywhere outside the county. The movement of ash trees, ash logs, and hardwood chips out of Houghton County also has restrictions. These materials can only be moved with a compliance agreement from September 1 to April 30 (when the beetle is inactive).

Since 2004, a closure order has been in effect on the Ottawa, which restricts the movement of firewood from all EAB-infected areas. To further reduce the chance of EAB spread, the Ottawa Forest Supervisor established an order on October 2007 to restrict the movement of firewood onto the Ottawa from anywhere outside the Upper Peninsula of Michigan.

The Forest Service has cooperative agreements with the Michigan Department of Agriculture and Michigan Technological University to monitor for the EAB insect in Michigan. Traps 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 established purple paper traps across the Ottawa in 2009. The traps were baited with natural oils that contain compounds produced by ash trees when they are stressed. The traps were placed in areas where the spread would most likely occur, such as adjacent to campgrounds, picnic areas, and other recreation sites. Traps were also placed randomly across the Ottawa, mainly along roads, at a density of approximately 10 to 13 traps per township. No EAB were detected in any of the traps.

Although the EAB has not yet been found on the Ottawa, most experts believe the beetle will eventually become established here, despite all of the monitoring and control efforts in place.

**Sirex Woodwasp:** This exotic insect from Europe, Asia, and North Africa 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), the Michigan Department of Agriculture, the Michigan Department of Natural Resources and Environment (MDNRE), and the Forest Service placed funnel traps on the Ottawa, beginning in 2007, to detect the presence of the sirex woodwasp.

No woodwasps have been detected on the Ottawa or anywhere in the Upper Peninsula of Michigan.

**Drought:** All of the Upper Peninsula of Michigan, in addition to the northern part of the Lower Peninsula of Michigan and northern Wisconsin has been in a drought condition for much of the last five years. Drought can kill trees outright, but also results in stress, which makes trees them more susceptible to insect and disease attacks.

**Summary:** Current insect and disease levels on the Ottawa are compatible with restoring and maintaining healthy forest conditions. The Ottawa strives to maintain healthy, resilient 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 on physical and social environment

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). The MVUM was first published in April 2007 and is updated annually in April. Data for FY 2009 was obtained from 2009 MVUM dataset (US Forest Service, unpublished data).

### Physical Environment

During the publication of the first MVUM in 2007, Objective Maintenance Level (OML) 1 roads (identified as trails on the MVUM) and OML 2 roads were identified as open to OHVs, providing that OHV use did not lead to resource damage. Roads and trails with resource concerns, such as wet areas or the potential of sedimentation into stream channels, were not incorporated onto the MVUM (e.g., not open for travel). The April 2007 MVUM was essentially a mapping exercise of the existing condition, with most of the roads being field-verified prior to adding to the 2007 MVUM, but not all.

Table 9 identifies miles of trails and roads open for OHV travel. The increase of miles from 2008 to 2009 is the result of the implementation of site-specific projects that included changes to designated access.

**Table 9. Miles of Trails and Roads open to Off-Highway Vehicles (OHVs), Ottawa National Forest, 2006 – 2009.**

<b>Motor Vehicle Use Map Data</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Miles of OML 1 roads (trails) open to OHVs	1,772	1,711	1,702	1,737
Miles of OML 2 roads open to OHVs	659	638	636	654
Total Miles open to OHVs	2,431	2,349	2,338	2,391

### Social Environment

During the public comment period for the Forest Plan revision, the public expressed concern that restrictions on OHV use were discriminatory to older individuals and violated the

Americans with Disabilities Act (ADA). Public comments were also sought prior to the production of the 2007 MVUM and 2008 MVUM. The public expressed concern over losing motorized access to traditional hunting areas, and again voiced concern of discrimination against the elderly and people with disabilities. However, travel management restrictions implemented on the Ottawa apply equally to all individuals and thus do not violate the ADA. The FY 2008 M&E Report contains additional information on this topic (USDA Forest Service, 2009; see page 10).

In 2009, the Forest published a Decision to establish several connector routes across the Forest for motorized access to connect roads under federal jurisdiction to existing OHV trail systems managed under county and state authority. However, the Decision was appealed and consequently reversed. Therefore, the Forest could not implement the connector routes as we expected. We are working to complete a revised Environmental Assessment to address unresolved appeal issues and disclose new information obtained since the release of the original Environmental Assessment in March of 2009.

## **Effectiveness of Managing Off-Highway Vehicle Use**

This topic was addressed at length in the previous FY 2008 M&E Report (USDA Forest Service, 2009, see page 11). One concern that has come to light in the intervening year is in regards to the miles of OML 2 managed for OHV travel. The Final Environmental Impact Statement (pages 3-19 to 3-21) for the Forest Plan provides for an estimated desired condition of managing for approximately 650 miles of OML 2 road open to OHV use. As displayed in Table 9, the miles of OML 2 roads has increased to about 654 miles. It is important to note that we anticipate the number of OML 2 roads to fluctuate as site-specific projects are implemented.

## **Effectiveness of Road and Trail Closures in Prohibiting Unauthorized Motorized Use**

There are a variety of reasons to close Forest Service roads to passenger vehicles and/or OHV traffic, including protecting the road surface from rutting, protecting rare species, preventing spread of invasives and preventing 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. Over two-thirds of OML 1 roads, used during timber harvest operations, are closed after logging operations are completed. However, if someone is determined 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.

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. Going forward, the Forest should develop and implement practical effectiveness monitoring in areas of known, repeated violations. The goals would be to determine effectiveness of various closure devices over time, and reduce breaching of closure devices over time through an adaptive management approach.

## **Harvested Lands Adequately Restocked After 5 Years**

The Ottawa performs stocking surveys to monitor the success of natural and artificial regeneration on all timber harvests with a regeneration objective. These treatments are planned following the timber harvest, or after the first-year or third-year stocking surveys if the surveys indicate a need. Regeneration harvests, site preparation treatments, stocking surveys, and regeneration certification information are all stored in the FACTS database.

In FY 2004 a total of 4,117 acres received final timber harvests (shelterwood removal cuts, single tree selection cuts, and clearcuts). To determine whether the FY 2004 final timber harvests were adequately stocked after five years (FY 2009), stocking surveys were performed on all stands that were not already certified to determine if they could be certified as adequately stocked. All 4,117 acres (100%) of final timber harvest acres were certified as adequately stocked.

## **Management Indicator Species (MIS)**

The Forest Plan identified four MIS (a suite of benthic stream invertebrates, ruffed grouse, American marten and a spring ephemeral plant, cut-leaf toothwort). The status of all of these species was reported initially in the 2007 M&E Report. These initial narratives, which contained details on methodology and background information, will not be presented again in this report. The following narratives are limited to the results of 2009 monitoring and trends analysis, if any. The reader is encouraged to review the 2007 M&E Report for additional information (pp. 9-14).

### **Mayfly, Stonefly, Caddisfly**

Biological indicators are commonly used to determine the condition of streams based on the species of macroinvertebrates or fish present. One common indicator uses the presence of three orders of aquatic insects that are associated with cold, high quality water. They are the **E**phemeroptera (mayflies), **P**lecoptera (stoneflies), and **T**richoptera (caddisflies). This indicator is referred to as the **EPT** metric. This was the fourth year of monitoring for EPT as a MIS. The survey protocol was the “Ottawa National Forest Ephemeroptera-Plecoptera-Trichoptera (EPT) Management Indicator Species survey protocol” (Dunlap 2006). Data collected is stored in the NRIS Aquatic Survey Module.

In 2009, a total of 29 streams were sampled across the Ottawa. Surveys were performed by a Forest Service crew between 7/30/2009 and 8/27/2009. Data for each of the 29 stream reaches are contained in the specialist report, but are not included here in the interest of brevity.

**Results:** This analysis is restricted to 22 streams that have at least three years of monitoring data. Therefore, the following discussion should not be extrapolated to the other streams on the Forest. As more streams are added to the analysis, and more years of data are accumulated, it will be possible to present Forestwide predictions of population and habitat trends for the EPT suites of species.

Population trends were analyzed graphically to determine trends; significance of these trends was determined using a one-way analysis of variance (ANOVA). A Hartley's test was used to determine the homogeneity of variance for the data. If the variance was not homogeneous between the groups, data was Log transformed.

1. There has been a significant downward trend in EPT density/m<sup>2</sup> since 2006 ( $F_{3,79}=8.782$ ,  $P=0.0000452$ ).
2. There was no trend in the % EPT composition of the benthic community ( $F_{2,45}=2.329$ ,  $P=0.109054$ ).
3. There was a small decrease in the mean number of EPT families collected from 2006 to 2009 ( $F_{3,79}=3.438$ ,  $P=0.021$ ).
4. There was a significant downward trend in mean EPT populations from 2006 to 2009 ( $F_{3,79}=4.698$ ,  $P=0.00461$ ). This agrees with the downward trend in mean density of EPT.
5. There was no change in available habitat from 2006 to 2009 in the 22 survey streams ( $F_{3,79}=0.349$ ,  $P=0.7898$ ).
6. There was a high degree of variability in all three survey years.

**Discussion:** There was a decrease in the mean EPT density, number of EPT taxa, and estimated populations in the 22 streams from 2006 to 2009. The other measures examined, % EPT and habitat, showed no change over the same period.

There was a statistically significant decrease in three of the measures; the mean density of EPT, the mean number of EPT taxa, and the mean estimated population of EPT taxa. However, there has actually been little change in mean values since 2006. The decreasing trend is largely an artifact of the unusually high numbers found in 2006. In fact, there was a slight increase in the estimated EPT population in 2009. In addition, there was a small decrease in the number of EPT taxa from 2008 to 2009. Given that the range of potential values is quite small, approximately 6 to 14 different taxa, a small yearly difference could be statistically significant without being ecologically significant. This is most likely the case in the trend information shown, because there is no obvious cause for a reduction in taxonomic diversity. Until enough data can be collected to show a clear trend, or there are large changes in diversity attributable to management activities, the simplest explanation for small year-to-year changes is random variation.

In conclusion, since 2006, most measures of EPT populations have been stable. Small variations in values are to be expected from year to year. More years of monitoring are required to overcome this variability. Based on the four years of surveying, taking into account random variability, EPT populations appear stable.

## Literature Cited

Dunlap, M. S. 2006. Ottawa National Forest Ephemeroptera-Plecoptera-Trichoptera (EPT) Management Indicator Species Monitoring Protocol and Information Manual. 41 pp.

## 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. As such, ruffed grouse were selected as our MIS that represent early-seral forest habitats. 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 provide additional cover.



Photo 1 Ruffed Grouse harvested on the Ottawa

The 2006 Forest Plan calls for a mix of age classes within the aspen/paper birch vegetation type to support wildlife species diversity, economic activity 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 would ensure provision of all age classes of aspen.

**Status of Habitat:** As of 2009, there are about 6,400 acres of aspen/paper birch in the 0-9 year age class, which is about one-half of the long-term Forest objective. This number represents a significant reduction from 2008, when about 8,225 acres of aspen/paper birch stands were between 0-9 years of age. Part of the problem lies in our inability to guarantee a steady rate of annual aspen harvest. For example, in 2009, about 2,250 acres of aspen grew into the 10-year age class, while only about 450 acres of aspen/paper birch were clearcut in 2009, and thus recruited into the 0-year age class.

Timber budgets have been steadily decreasing on the Ottawa since 2006, and thus funding has not been available to implement the Forest Plan at its full level (average of 90 MMBF per year). As a result, fewer acres of aspen are being regenerated than anticipated. The Forest Plan's timber sale program of about 90 MMBF per year was proposed to implement the Forest Plan metrics as designed, compared to the actual sale program of about 44 MMBF (see Table 2) from FY 2006 to FY 2009.

The Ottawa currently has over 43,000 CCF (about 13,300 cords) of aspen under contract on about 56 active timber sales. Because of the economic recession, timber markets were down

substantially in FY 2009, including the market for aspen products. As a result the aspen harvest was reduced in FY 2009 from what it otherwise would have been. As the 43,000 CCF of aspen is still under contract, it is anticipated to be harvested once the aspen market improves.

We do not expect large increases in aspen clearcutting over the next few years as all of the recent NEPA decisions (Ridge, Mud Lake, and Rousseau East) encompassed landscapes that were dominated by northern hardwood forest types, so opportunities to regenerate aspen/paper birch forest types were limited. In order to maintain ruffed grouse habitat, the Ottawa will need to actively look for opportunities to regenerate aspen and paper birch (where feasible) on future vegetation management projects. With the large amount of aspen/paper birch in the 70-year age class and older (currently about 45,000 acres) the amount of aspen/paper birch in the 0-9 year age class could potentially increase over the next decade if the Forest can access these stands, complete the site-specific analysis processes, and sell the resultant timber sales. Non-commercial regeneration of aspen/paper birch stands is done occasionally, but it cannot be expected to contribute more than a percentage point or two to the overall aspen/paper birch harvesting strategy.

**Status of Population:** Ruffed grouse are inherently cyclical in their populations, following a 7 to 10 year cycle. Ruffed grouse populations on the Ottawa are monitored through standard drumming survey routes in cooperation with MDNRE. 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 averaged 28 drums per route in 2009. A total of 17 routes were monitored by Ottawa staff in 2009. The highest number of responses was 74 (Matchwood Tower – an Ontonagon Ranger District route) and the lowest number of responses was 9 (Gardner - a Kenton Ranger District route). Populations were very good in 2008 and 2009. We expect that populations will peak in 2010, and then would be expected to decline in the following years.

**Discussion:** Our timber program has benefitted this species through regenerating forests containing mature aspen trees. 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 American marten as an MIS for large tracts of mature forest habitat with abundant vertical and horizontal cover. Marten were extirpated from the western Upper Peninsula in the first half of the 20<sup>th</sup> century due to exploitation of the species and its habitat. After several decades of absence, marten were re-introduced to the Porcupine Mountains Wilderness State Park in the 1960s and multiple additional areas in the western Upper Peninsula during the 1970s and 1980s. Since re-introduction, marten populations have been

recovering slowly, but steadily across the western Upper Peninsula. They have recovered to the point where they are now treated as a game animal (furbearer) with a short trapping season and season limit of one in the Upper Peninsula. A two week trapping season (December 1-15) has been ongoing since its establishment in 2000.

**Status of Habitat:** Suitability of habitat for marten on the Ottawa varies by MA. Those MAs containing mature forest with a coniferous understory and canopy component; woody debris on the forest floor including large stumps and logs; and large trees with den holes, contain the most suitable habitat on the Ottawa.

All MAs on the Ottawa contain these components to a certain extent. Management Areas with an early succession forest emphasis, such as MAs 1.1a and 4.2a, contain less suitable habitat than MAs emphasizing late successional forest. However, even the early succession forest MAs contain some suitable habitat with riparian areas and designated old growth that has matured into suitability.

**Status of Population:** The best Forestwide dataset on marten is available via Michigan DNRE’s fur harvest registration program as described in the FY 2007 M&E Report. Table 10 shows the number of marten registered within the portion of the western Upper Peninsula that comprises the Ottawa. The number of trapped marten over the last 9 years has gradually increased across the Ottawa and the western Upper Peninsula, which indicates an increasing population of marten. While the numbers shown in Table 10 indicate stable numbers of marten trapped on the Ottawa, the counties within the Ottawa have increased from 37 animals in 2000 to 105 animals in 2008 (Michigan DNRE 2000 to 2009).

**Table 10. Number of marten registered by the State of Michigan in the Western Upper Peninsula from 2000 to 2008.**

Year	Number of Marten Registered on or within one 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
2008	29	105

It is not known whether all suitable habitats on the Ottawa have resident marten, since recent surveys only represent a point in time and cannot be considered definitive. The Ottawa has established four permanent winter tracking routes which have been monitored since 2007.

The routes are located in both managed and unmanaged areas of the Forest and are surveyed at least one day each year. As shown in Table 11, marten have been detected at least once on each transect during the first 3 years of surveys.

**Table 11.** Number of marten detections, by survey route and year, on the Ottawa.

Transect Name	2007	2008	2009
Horn Lake	2	0	3
Matchwood	0	0	1
Sturgeon River	2	4*	4*
Sylvania	1	1	0

\*Highest number detected on single survey day and does not necessarily equate to number of American marten present.

**Summary:** In summary, marten populations appear stable to increasing at this point in time. Forested areas of the Ottawa continue to mature and age, and therefore, habitat continues to increase in suitability in both managed and unmanaged areas of the Forest. With over half of the Ottawa in an unsuited category for commercial timber management, we believe the Ottawa will provide adequate suitable habitat for American marten and all other species requiring late successional habitat requirements into the foreseeable future.

### Cutleaf Toothwort

Cutleaf toothwort was selected as an indicator species for timber management of northern hardwoods, a dominant forest type which is managed for timber on the Ottawa (see Photo 2). In 2009, the Ottawa completed the fourth year of monitoring this new indicator species by looking in the most likely places for this plant and observing if it was present. Methodology of surveys has been described in previous M&E Reports (see FY 2006 M&E report for details of methods used).



**Photo 2** Cutleaf toothwort in bloom

Thirty stands were surveyed once between late May and early June 2009 by an Ottawa botanist or technician. Each survey lasted about 1 hour. While all these stands were expected to have equal potential for cutleaf toothwort, it was observed in 15 of the 30 stands. Six of the stands with toothwort had no recent harvest history; the other nine were treated between 1979 and 2002. In six of the stands, toothwort was observed at “trace” levels; in the other nine, it was recorded as “scarce” to “occasional” with two stands where it was rated “common”.

The 2006 to 2009 data sets were combined for analysis (see Figure 3). Cutleaf toothwort was found in 51 of 105 stands surveyed (49%). It was found in 26 (43%) of the 60 managed stands and 25 (56%) of the 45 unmanaged stands. 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 or weedy

ground flora. No particular patterns were noted. There was no statistically significant difference for the occurrence of cutleaf toothwort in managed vs. unmanaged stands.

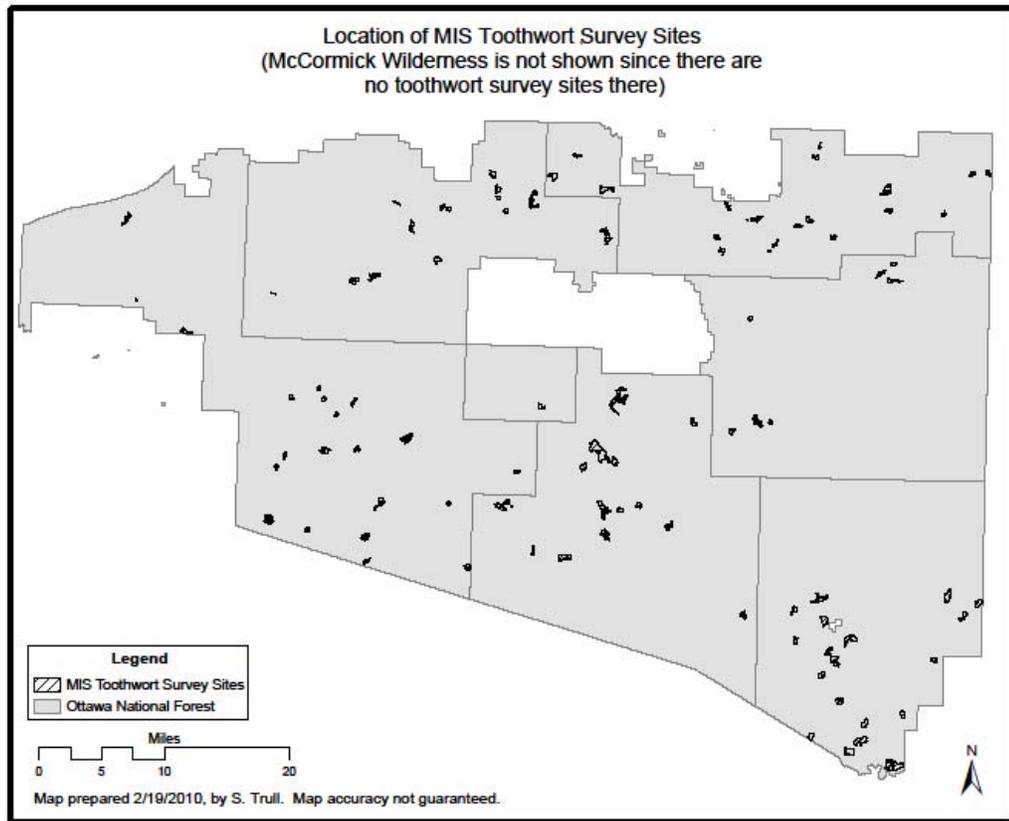


Figure 3. Distribution of sites surveyed to date for MIS toothwort, 2006-2009

## Non-Native Invasive Species

### Invasive 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 M&E report.

**Monitoring Methods:** New records of high priority invasive plants infestations, as well as medium priority invaders (non-roadside infestations) are annually recorded during field review performed by Ottawa staff, contractors, and volunteers. 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.

**Results:** About 490 acres of invasive plant treatments were monitored in 2009. The average treatment efficacy was 78.5%, which scores as "Good". Treatment was successful in killing

most of the target species population. Treatment efforts in 2009 were similar to previous years with the following differences:

- A weed crew was hired, consisting of three seasonal employees who obtained state pesticide applicator certification.
- About 248 acres were treated by manual or mechanical methods; about 726 acres were treated with pesticides. Most of the acres treated were infestations of Japanese barberry and exotic honeysuckle.
- Two new sites of garlic mustard were found, bringing the total to twelve sites on NFS land. More time and resources are needed each year to control this highly invasive plant.
- Biological control insects were released for the first time to control spotted knapweed.



The lesser knapweed flower weevil (*Larinus minutus*) and knapweed root weevil (*hycleonus achates*) beetles were obtained from Montana and released at five locations, mostly gravel pits, under permit from USDA Animal and Plant Health Inspection Service (see Photo 3).

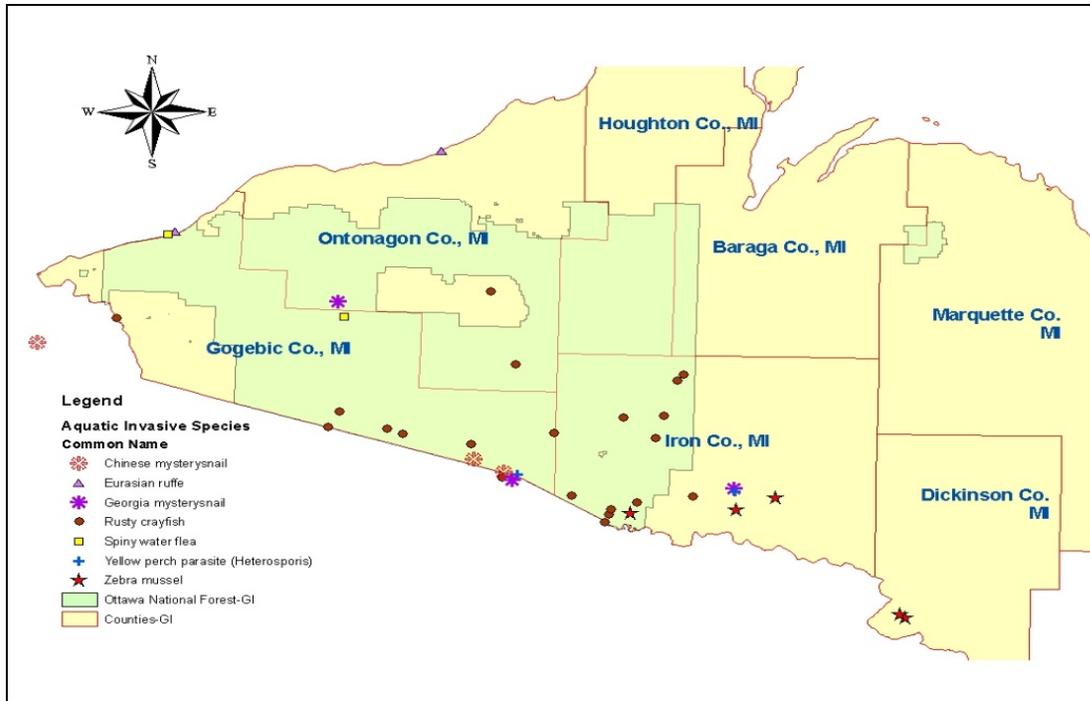
These locations are expected to become insect breeding grounds, from which we will collect the knapweed-consuming beetles in future years, for release at high density knapweed locations on the Forest where control is desirable.

**Photo 3** *Cyphocleonus* weevil on knapweed flower

### **Invasive Animals**

In 2009, 23 lakes and seven streams were surveyed for aquatic invasive plant and animal species. Monitoring was performed by Forest Service personnel and Forest partners. They confirmed new occurrences of *Orconectes rusticus* (rusty crayfish) on the Ottawa in 2009 (Figure 4). One report was from Mile and One-half Creek in Ontonagon County. This site is outside the Forest's Proclamation Boundary but within the center of the Forest. The other report was from Moon Lake in Gogebic County, which is within the Forest boundary and has an existing Forest Service boat launch. No other new occurrences of non-native invasive animals already present within the Forest were reported in 2009.

One infestation of a new invasive aquatic animal was detected in 2009. *Dreissena polymorpha* (zebra mussel) is now known to occur within Hagerman Lake in Iron County. Nearby lakes outside the National Forest boundary were already known to have established populations of zebra mussel (Chicagon Lake and Fortune Pond, Iron County, MI and Moon Lake and Lake Antoine, Dickenson County, MI). No infestations of *Potamopyrgus antipodarum* (New Zealand mud snail) were reported on the Forest in 2009, although they continue to occur in Lake Superior (Duluth Harbor). Five species of exotic earthworms continue to exist on the Ottawa (see the 2007 M&E Report for more information).



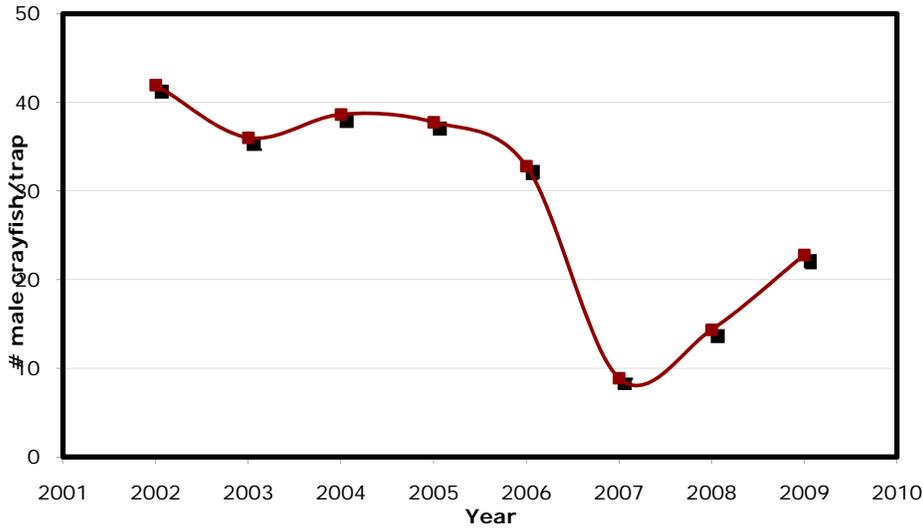
**Figure 4. Map of invasive animal locations in and around the Ottawa.**

In addition to surveys for new NNIS occurrences, control treatments and prevention activities for rusty crayfish were implemented in 2009. Ottawa personnel trapped and removed large rusty crayfish from Pomeroy Lake (Gogebic County). Eighty-three commercial crayfish traps baited with fish carcasses were set and pulled daily for two weeks. This effort resulted in the removal of 144 rusty crayfish from the lake, which was not a significant portion of the population.

To increase the effectiveness of smallmouth bass predation on rusty crayfish, the Michigan Department of Natural Resources and Environment previously instituted special catch and release regulations for bass in Lake Ottawa designed to increase average bass size (see the 2007 Ottawa NF M&E Report for more information). Previous research indicated that the large areas of cobble substrate in Lake Ottawa are especially conducive to rusty crayfish use and that complete eradication of the exotic crayfish in this lake is unlikely. Therefore, the idea is to control crayfish population numbers through bass predation to levels that allow re-vegetation of the lake and a healthier balance among the aquatic species.

The University of Notre Dame Environmental Research Center (UNDERC) established a study in 2001 to evaluate the rusty crayfish population, habitat characteristics and crayfish interactions with smallmouth bass within Lake Ottawa. This study continued in 2009, which also included a new focus in the study of the effect of rusty crayfish predation on smallmouth bass eggs and its role in bass nest abandonment (Baldrige 2010). Preliminary results revealed that rusty crayfish were present at nests immediately before the nests were abandoned. Also, the study's 2009 average crayfish trap catches indicated an increase in Lake Ottawa rusty crayfish abundance since 2007 (see Figure 5).

**Rusty Crayfish Average Trap Catch in Lake Ottawa**



**Figure 5. Rusty crayfish average trap catches in Lake Ottawa, Ottawa National Forest.**

### **Literature Cited**

Baldrige, A. 2010. Predation of smallmouth bass eggs by rusty crayfish in Lake Ottawa. Interim study report. University of Notre Dame. 6 pp.

## **Amount of Roads and Trails open to OHVs and Providing Connections with other Public Trails**

Under the 1986 Forest Plan, the Ottawa was generally open to OHV use on OML 1 roads and OML 2 roads, unless posted closed. Cross-country OHV use was allowed. The Forest Plan prohibits OHV cross-country use and requires that OHV use occur only on roads or trails designated for such use.

The Ottawa's implementation of the Forest Plan is a multi-staged approach. The first stage was to issue a Forest closure order to prohibit cross-country OHV travel, after publication of the Forest Plan. The second stage was to develop a Motor Vehicle Use Map (MVUM), which displayed road routes/trails available for motorized travel (including OHV travel). The first MVUM was published in April of 2007. The map displayed the existing condition of the Forest Plan. Roads with associated 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). Approximately 640 miles of road routes (OML 2) and 1,710 miles of trail (OML 1) were designated for use on the 2007 MVUM. Approximately 86%, of the trails were under a mile in length. The 2008 MVUM identified about 1,700 miles of OML 1 roads (trail) and 635 miles of OML 2 roads. The 2009 data used for the production of the 2010 MVUM

identified about 1,735 miles of trail and 654 miles of OML 2 roads available for OHV travel (Table 9).

Within the Ottawa’ proclamation boundary, there are two State designated multi-use OHV trails (Iron River to Marenisco, and Sidnaw to Bergland) on old railroad grades. The Forest Plan provides direction to establish two north/south connector routes to the existing State of Michigan east/west multi-use trails. These new connectors would provide opportunities and improve access to essential services and recreational destination points for OHV users. In order to provide connector routes between these two trails, OML 3 (and potentially some OML 4 roads) would have to be designated for OHV use.

In January of 2008, the Ottawa initiated efforts to establish two connector routes between the two State designated OHV trails. This effort also focused on providing local OHV connector routes between communities scattered across the Forest. This project is being revised due to being reversed upon appeals, but once finished should provide more riding opportunities for OHV enthusiasts.

## **Providing Motorized and Non-motorized Recreation Opportunities in Accordance with Management Area Direction**

The Ottawa is subdivided into specific Management Areas (MAs). Each MA has its own goals and objectives along with specific direction which are described by desired conditions, standards, and guidelines. Each MA also has a specific recreation setting or classification as identified by the Recreation Opportunity Spectrum (ROS). The ROS is used to identify, describe, plan, and manage a range of recreation settings, opportunities, and experiences. The Ottawa has four ROS classifications: Semi-Primitive Non-Motorized (SPNM, Wilderness); Semi-Primitive Non-Motorized (SPNM); Semi-Primitive Motorized (SPM); and Roded Natural (RN). SPNM classification on the Ottawa is used for both wilderness and non-wilderness areas. Table 12 summarizes acres and miles of OML 1 road (trails) and OML 2 roads per MA.

**Table 12. Summary of MAs and miles of OML 1 and 2 roads open to OHVs, as depicted in Ottawa’s 2009 MVUM database.**

<b>Management Area</b>	<b>ROS Classification</b>	<b>NFS Acres</b>	<b>Miles of OML 1 Roads</b>	<b>Miles of OML 2 Roads</b>
MA 1.1a	RN	62,200	150	32
MA 2.1	RN	285,900	458	161
MA 2.2	RN	153,700	514	155
MA 3.1a	RN	87,800	179.0	111
MA 4.1a	RN	138,200	266	130
MA 4.2a	RN	12,900	28	24

Management Area	ROS Classification	NFS Acres	Miles of OML 1 Roads	Miles of OML 2 Roads
MA 5.1	SPNM, wilderness	16,850	0	0
MA 5.2	SPNM, wilderness	14,500	0	0
MA 5.3	SPNM, wilderness	18,400	0	0
MA 6.1	SPNM	57,000	8	9
MA 6.2	SPM	52,400	100	18
MA 7.1	RN	1,100	0	0
*MA 8.1	SPNM, SPM, RN	67,000	29	13
MA 8.2	RN	2,600	0	0
MA 8.3	SPNM	10,600	1.4	1.1
*MA 9.2	SPNM, SPM, RN	8,900	3.7	0.3
MA 9.3	SPNM, SPM, RN	3,200	0.2	1.0

\*Wild and Scenic Rivers may have multiple ROS classifications dependent upon the rivers' segment classification of wild, or scenic, or recreation.

There are approximately 57,000 acres of NFS lands in Management Area (MA) 6.1, Semi-Primitive Non-Motorized. This MA restricts trail use to non-motorized uses with two limited exceptions: Forest Service administrative use or under written authorization such as a Special Use Permit, and OHV/snowmobile use of existing Forest Service-designated OHV/snowmobile trails and routes. There are approximately 52,400 acres of NFS lands in MA 6.2, Semi-Primitive Motorized. This MA allows for motorized recreation on designated trails and roads. On the Ottawa's first MVUM, approximately 1,710 miles of OML 1 roads (OHV trails) and 640 miles of OML 2 roads were identified for OHV use. Of these miles, approximately 8 miles of OML 1 roads and 9 miles of OML 2 roads are in MA 6.1. MA 6.2 consists of approximately 100 miles of OML 1 roads and 18 miles of OML 2 roads. The first MVUM was a mapping of existing condition; therefore, future monitoring reports will use this information as a baseline.

Snowmobiling is a large recreational attraction across the Ottawa, with most of the Forest open to cross-country travelers, and with many miles of designated, groomed snowmobile trails. The Ottawa has supported local governments and snowmobile associations in development of an extensive trail system. Snowmobile use is limited to designated trails within MA 6.1, due to its SPMN designation. In addition, the three Wilderness areas (MAs 5.1, 5.2 and 5.3) are not open to any snowmobile use. Collectively, these areas provide opportunities for those seeking a remote, non-motorized winter recreation experience.

There are about 100,000 acres of non-motorized areas, comprising about 10% of the acreage of the Ottawa. These areas are scattered across the breadth of the Ottawa, with the bulk of the acreage in the three federally-designated Wilderness areas (MAs 5.1, 5.2 and 5.3) and

MA 6.1. Across all MAs, there are about 250 miles of hiking trails, including 109 miles of the North Country National Scenic Trail. There are about 50 miles of hiking trails within designated Wilderness areas and about 57 miles of hunter walking trails. Table 13 below provides a summary of the type of hiking trails available on the Ottawa.

**Table 13. Miles of Non-Motorized Trails on the Ottawa National Forest.**

<b>Trail Type</b>	<b>Miles</b>
North Country National Scenic Trail	109
Hunter Walking Trails	57
Wilderness Trails	50
Other Hiking Trails (Interpretive, Observation, etc.)	34

## **Management Activities in Semi-Primitive Non-Motorized Areas and Recreation Opportunity Spectrum Objectives**

The MA that is specifically identified for SPNM is MA 6.1, which is comprised of about 57,000 acres in 5 tracts (see Forest Plan, pages 3-55 to 3-60). The Forest began implementing timber sales in the 3 Corners Vegetation Management Project in FY 2007, with multiple sales being active in 2009. Timber harvest, with appropriate measures, is compatible with the ROS. The Forest continues to work with the North Country Trail Association and National Park Service to maintain the North Country National Scenic Trail segments which lie within MA 6.1 across the Forest. The Ehlco Tract, Trap Hills and Norwich portions of the MA, comprising an east-west corridor stretching nearly 30 miles from Porcupine Mountains Wilderness State Park to Old Victoria, are managed for non-motorized enthusiasts.

The Pioneer Multi-Use Trail runs through portions of MA 6.1, which is legally used by snowmobiles and OHVs. Motorized uses also occur on roads under state, county, and township jurisdictions. State-designated snowmobile trails also occur within and bordering some tracts of MA 6.1.

Recreation Opportunity Spectrum Objectives for MA 6.1—*maintain or increase opportunities for quiet and remote experiences in semi-primitive non-motorized areas*—are not fully being met, largely because when we approved the Forest Plan there were miles of OML 1 and OML 2 roads that had historic use by snowmobiles, OHVs, and passenger vehicles. Going forward, the Forest should continue to seek opportunities to close those roads and trails to motorized use, as per MA 6.1 direction. There are approximately 8 miles of trail (OML 1) and 9 miles of road (OML 2) open to OHVs within the Forest’s MA 6.1 areas. These miles are the same as those reported on page 18 of the FY 2007 M&E Report.

## **Tribal Rights and Interests**

The Forest Service shares in the United States’ legal 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 outlined its policies and responsibilities on tribal relations in a 1999 Memorandum of Understanding (that is, the MOU regarding 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 Forest Plan was developed through consultation with the tribes.

Annually in October, Forest Service leadership meets with the MOU tribal signatories to discuss MOU implementation, to facilitate on-going communication, and to discuss issues arising under the MOU. The MOU has been in place for ten years and is running smoothly. Through provisions laid out 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 Forest Plan has facilitated MOU implementation.

## **Diversity and Abundance of Native Plants and Animals in Lakes and Streams**

### **Plants**

The Forest does not have data to address this topic as yet. Efforts will be made in future years to collect monitoring data to address Forest Plan implementation relative to diversity and abundance of native plants in lakes and streams.

### **Animals**

The Forest Plan directs the Ottawa to maintain or restore the abundance and diversity of native aquatic species, in order to ensure that healthy aquatic communities are preserved. One method to track the status of aquatic communities is through annual fish surveys of streams and lakes within the Forest. Aquatic insects are also monitored annually as Management Indicator Species (see the MIS section of this report).

On the Forest, fish surveys are mainly accomplished through the use of electrofishing and fyke nets, and the description, uses and methods of each are explained in the Michigan Department of Natural Resources and Environment's *Manual of Fisheries Survey Methods II* (Schneider 2000).

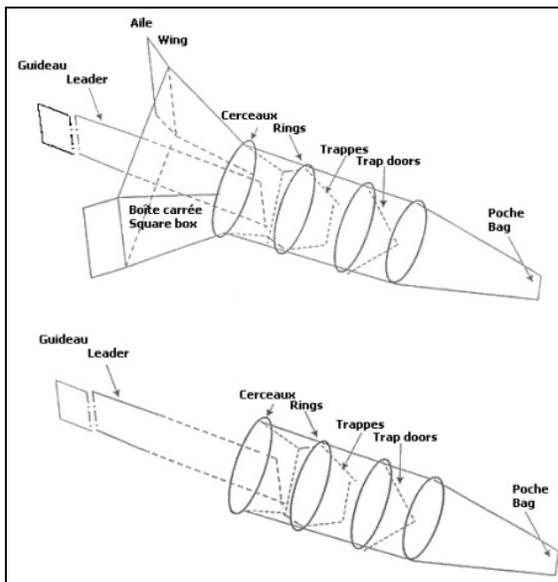


**Photo 4 Crew electrofishing a stream on the Ottawa National Forest**

Streams are usually sampled using backpack or barge electroshockers (see Photo 4). These electroshockers produce a pulsed DC electric current that is powered by either a battery or a small generator. The positive electrode is a hand-held probe, while the negative electrode is either a wire attached to the bottom of a backpack electroshocker that is dragged in the water, or a strip of metal along the bottom of a small barge that is pulled through the water.

Lakes are often sampled using fyke nets, which consist of a series of chambers with one-way

conical entrances and a leader net to guide the fish in as they travel along the shoreline (see Figure 6).



**Figure 6. Diagram of a fyke net**

Fyke nets are generally set at and perpendicular to the shoreline at depths from 0 to 6 feet. Sites are chosen where the lake bottom slope allows nets to be set so that their top surface is barely submerged. Captured fish are collected at the bag end (see Figure 6) and are measured for length and weight.

Fish scales are sometimes collected in order to age fish and determine their size structure (length at age) in comparison to state averages. Other aquatic organisms collected in the nets (often turtles, bullfrog tadpoles and crayfish) are noted.

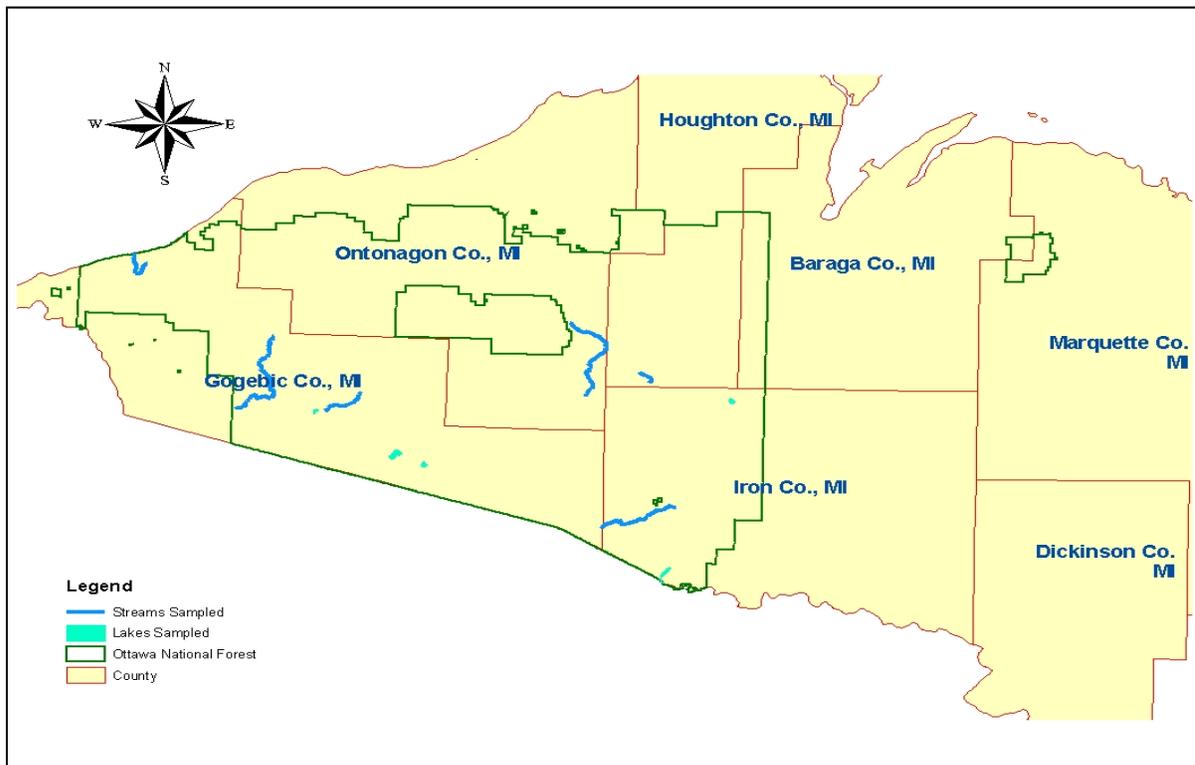
Species diversity, combining information on the number of species in a population (species richness) and the number of individuals of each species within that population (species evenness), can be estimated with several different indices (Guy and Brown 2007). Two that are commonly used to describe fisheries populations include:

- The Shannon-Wiener Index - This index generally ranges between 0 and 4, and a higher index value indicates increased diversity; and

- The Simpson Index (D) - Ranging between 0 and 1, a lower Simpson Index value indicates increased diversity.

## Stream Monitoring

National Forest personnel electroshocked six streams on the Ottawa during 2009 (Cook’s Run, Little Presque Isle River, Maple Creek, Pelton Creek, Trout Creek, Walton Creek) (see Figure 7). Cook’s Run was sampled in three locations; therefore, a total of eight sites were sampled. Fifteen species were captured, twelve of them native. The number of species per stream ranged from three to thirteen. The non-native species sampled were brown trout, rainbow trout, and coho salmon, all considered desirable sport fish by Forest users. The Cooks Run – Notre Dame Control site had the highest abundance and density of fish captured, whereas Pelton Creek had the lowest abundance and Little Presque Isle River had the lowest density. According to the diversity indices, Maple Creek was the most diverse of the sampled streams, which is not unexpected since the sampled reach is at the stream mouth where Lake Superior fish can enter the stream. Interestingly, highly productive Cooks Run was much less diverse, due to the fact it is one of the Forest’s high quality coldwater streams, which naturally tend to support fewer fish species (Lyons et al. 1996). See FY 2009 M&E Report Specialist Report for more detailed results of stream monitoring.



**Figure 7. Map of streams and lakes sampled within the Ottawa National Forest.**

## Lake Monitoring

During 2009, five lakes were surveyed with fyke nets (Bobcat, Brule, Clearwater, Langford, and Marten Lakes) (Figure 7). Each group of fyke nets within each lake was set for one series of three to five consecutive days, with nets checked every day during the sampling. Each lake was sampled once in 2009, and all sampling occurred between April and June. A total of 18 fish species were captured and all were native. Also captured was one species of turtle, *Chrysemys picta* (painted turtle). The number of fish species found in each lake ranged from five to twelve, with an average of 9.6 per lake. This monitoring was performed by National Forest personnel. Applying the diversity indices, it appears that Langford Lake was the most diverse in terms of number of species and number of individuals within each species, followed by Clearwater, Marten, Bobcat and Brule Lakes. The average Shannon-Wiener Index for all five lakes was 1.43, indicating a somewhat low diversity, which may be expected since these are coolwater mesotrophic (e.g., moderately productive) lakes. More detailed results of lake monitoring can be found in the FY 2009 M&E Report Specialist Report.

Guy, C.S. and M.L. Brown, editors. 2007. Analysis and interpretation of freshwater fisheries data. American Fisheries Society, Bethesda, MD.

Lyons, J., L. Wang, and T. Simonson. 1996. Development and validation of an index of biotic integrity for coldwater streams in Wisconsin. North American Journal of Fisheries Management 16:241-256.

Schneider, J.C., editor. 2000. Manual of Fisheries Survey Methods II: with Periodic Updates. Fisheries Special Report 25. Michigan Department of Natural Resources and Environment. Ann Arbor, MI. ([http://www.michigandnr.com/PUBLICATIONS/PDFS/ifr/ifrhome/Manual\\_intra.htm](http://www.michigandnr.com/PUBLICATIONS/PDFS/ifr/ifrhome/Manual_intra.htm))

## Key Terrestrial Habitat Components for Wildlife

The Forest does not have adequate data to address this topic as yet. Efforts will be made in future years to collect monitoring data to address Forest Plan implementation relative to key terrestrial habitat components. Key components include, in part, standing dead snags, down wood, low, dense conifer regeneration, hard mast and soft mast, which were disclosed as potentially limiting certain wildlife populations in the Forest Plan's FEIS analysis.

## Species of Viability Concern

This monitoring item is designed to track the viability of rare animal 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 animals which are not currently designated as RFSS animals.

### Bobcat

This species is not RFSS nor Michigan endangered nor threatened; in fact, it is fairly abundant and is classified as a game animal by the State of Michigan. There is a long trapping and hunting season in the Upper Peninsula for bobcats, with harvesters allowed to

take up to 2 bobcats per year. The Ottawa selected bobcat because it is a key terrestrial predator that is dependent upon a healthy and diverse prey base comprised of small and mid-size prey (e.g. mice/shrews to hares in body size). Due to time and personnel constraints, we were not able to complete this analysis. The Forest will include this analysis in our FY 2010 M&E Report (see Appendix 1).

### **Black-backed Woodpecker and Spruce Grouse**

The Ottawa was unable to assemble a thorough report for these two boreal, conifer-dependant species due to a lack of monitoring data. Anecdotal reports obtained while doing other work indicate that both species are still present within suitable coniferous habitats on the Ottawa, especially in the northeast corner of the Forest. The Baraga Bump wildfire of April 2007 created several hundred acres of prime nesting habitat for black-backed woodpeckers, with many territories being located in FY 2009. Reproduction was observed (Ottawa personal observations). In addition, spruce grouse chicks have been seen on rare occasion by Ottawa staff while doing other work (Ottawa personal observations), in the northeast portion of the Forest. The Forest should pursue targeted surveys for these species in FY 11 so that we can develop a solid report in a future M&E Report.

### **Common Loon**

Common loons were previously evaluated in the FY 2007 M&E Report, and much of that information about legal status of the species, Forest Plan direction, and habitat requirements is the same and will not be repeated here. This report will show results of the intervening two years of monitoring information.

Table 14 displays the productivity of loon chicks on the Ottawa since the survey began in 1985. Also included are the numbers of lakes surveyed, and the ratio of chicks produced to lakes surveyed, which may provide a better indication of actual productivity in any given year. One year (1987) is not included because of very limited survey effort in that year.

In 2009, 40 loon chicks of fledging-age were known to be produced on the Forest. Eight of these loon chicks were hatched from the 13 artificial nesting islands on the Forest placed by volunteer loon rangers and/or Forest Service staff.

**Table 14. Loon productivity and survey effort, Ottawa National Forest.**

<b>Year</b>	<b>Number of Chicks</b>	<b>Number of lakes surveyed</b>	<b>Productivity/Effort</b>
1985	59	110	0.54
1986	33	98	0.34
1988	46	51	0.90
1989	43	100	0.43
1990	35	70	0.50
1991	42	136	0.31

Year	Number of Chicks	Number of lakes surveyed	Productivity/Effort
1992	48	163	0.29
1993	48	149	0.32
1994	49	198	0.25
1995	74	192	0.39
1996	52	115	0.45
1997	40	106	0.38
1998	70	103	0.68
1999	64	124	0.52
2000	55	206	0.27
2001	59	217	0.27
2002	51	210	0.24
2003	50	209	0.24
2004	49	164	0.30
2005	62	171	0.36
2006	74	213	0.35
2007	69	198	0.35
2008	46	210	0.22
2009	40	176	0.23

**Status of Population:** Our monitoring indicates that loon productivity in 2008 (0.22 young per active territory) and 2009 (0.23 young per active territory) were lower than normal. These productivity rates are the lowest recorded during our entire surveying period. This long-lived species can withstand an occasional year of poor reproduction, without triggering population-level declines, but continued low production could be problematic. However, caution is needed when interpreting the data, since fewer lakes were surveyed prior to the year 2000. The lakes surveyed prior to 2000 were, on average, better long-term producers of loon chicks than the additional 80 or so lakes added to the survey effort in 2000. Increasing the survey effort in 2000 may have influenced the ratio of loon chicks produced per unit of survey effort. In addition, some year-to-year variation in productivity is likely due to factors beyond the Forest's control, such as weather-related events, during the breeding season and mortality of adult loons once they leave the Ottawa (during migration and/or on wintering grounds). The Forest received numerous calls from loon rangers in 2008 and 2009 reporting a number of loons abandoning nests due to harassment from black flies. Black fly swarms emerged later than normal during those years, peaking while adults were incubating eggs. This weather-related event probably contributed to the decline in chicks produced during 2008 and 2009.

The Ottawa will continue to work with groups such as Commoncoast Research and Conservation and the Michigan Loon Preservation Association to monitor loon breeding success on the Forest. Information gathered will also help to address threats to loons and loon habitat. The Forest currently has 13 artificial nesting islands placed on the Ottawa and the Forest will also continue to protect loons and loon habitat through the efforts described in the Forest Plan Objectives.

## Forest Raptors

Two forest hawks, northern goshawk and red-shouldered hawk, are recognized as Regional Forester Sensitive Species (RFSS) on the Ottawa. Both species are at the edge of their range in the western Upper Peninsula. The northern goshawk is a boreal species with the Upper Peninsula and northern one-third of Wisconsin being the southern edge of boreal habitat where goshawk can be found year round. Conversely, the Upper Peninsula is near the northern extreme where some red-shouldered hawks migrate for the breeding season.

**Status of Population:** As dominant predators, both hawks are found in low numbers and are difficult to detect. Both species may experience some level of change in abundance from year to year due to environmental factors such as weather and prey abundance. The Ottawa is specifically interested in population changes that exceed normal fluctuations and that may be due to management-induced habitat changes.

In response to public requests for scientifically defensible data that supports the viability of goshawk populations, the Ottawa teamed with state, federal, and University of Minnesota biologists to implement a bioregion-wide census of the species (Bruggeman and Erdmann, 2009). The Western Great Lakes bioregion consists of approximately the upper two-thirds of the states of Michigan, Minnesota, and Wisconsin as well as, a large portion of SW Ontario. For logistical reasons, the province of Ontario and the lower peninsula of Michigan were not included in the survey effort.

In 2008, project collaborators surveyed 86 Primary Sampling Units (PSUs) throughout the bioregion for goshawk presence between mid-May and late June, and again between July and mid-August. Based on these surveys, we estimated that there were 1,413 +/- 96 PSUs with goshawk occupancy in Michigan's Upper Peninsula. We estimated there were 265 +/- 145 PSUs occupied by goshawks on the Ottawa. Similar statistics throughout the bioregion indicate that goshawk were widely distributed and occurred at significant densities throughout the region in 2008. While these numbers are encouraging and indicate a viable healthy population of goshawks in the bioregion, additional monitoring is required to determine a population trend.

It is desired that these surveys be repeated every five years, which would result in the next survey being conducted in 2013. A five-year interval, while not as ideal as yearly intervals, would provide a trade-off of information obtained for money spent. The Ottawa should be a partner in any future collaborative survey efforts for this species.

Unlike goshawks, landscape-level surveys have not been done for red-shouldered hawks. Anecdotally, Ottawa staff has discovered about a dozen active nest territories over the years. The best information regarding population status of the red-shouldered hawk at this time is a continental assessment produced by Partners in Flight (PIF), which can be found at: [http://rmbo.org/pif\\_db/laped/](http://rmbo.org/pif_db/laped/) . For the red-shouldered hawk, the global population estimate is 830,000 with 99% estimated in the US and Canada.

**Status of Habitat:** Currently, about half (457,000 acres) of the total acres of the Ottawa is upland or lowland hardwood habitat. Of this, the vast majority is upland habitat

(approximately 435,000 acres) consisting of maple or mixed northern hardwoods. None of the lowland hardwoods (approximately 22,000 acres) are in the suited (e.g., managed for forest products) landbase. Of the upland acres, about 55% (237,000 acres) are in the suited category managed for timber value and production, meaning that about 45% of the upland forest is not being manipulated for timber production. Therefore, natural forest maturation and disturbances are proceeding, unaltered by silvicultural actions. With respect to prey-producing habitat, the Ottawa is attempting to maintain about 55% (109,000 acres) of the current aspen types, and about 59% (10,000 acres) of jack pine for early seral habitat and prey production. However, a reduced timber sale program has reduced the acreage footprint of our operations by about half of what was expected when the Forest Plan was approved.

Of the suited acres of upland hardwoods, Forest Plan goals are treatment of 6,700 acres selection harvest per year during the first decade of implementation. Goals for clearcutting aspen habitats are 1,900 acres per year during the first decade. In the first 4 years of implementing the Forest Plan, the Ottawa has averaged 2,207 acres of selection harvest in hardwoods and 784 acres of clearcut in aspen and jack pine types (see Table 4). These acres of harvest represent only about one-third of the annual harvest rate analyzed for the Forest Plan. Therefore, habitat for these birds is not being managed to the extent we initially expected.

Generally, quality of nesting habitat for both hawks continues to improve on the Ottawa with maturation of the second growth hardwood stands, and to a lesser degree conifer stands, dating back to the early twentieth century. Many acres of the Ottawa are already suitable nesting habitat, evidenced by the fact that most of our nests are discovered in proposed timber sale areas.

**Summary:** If a limiting factor exists, it would be lack of a suitable prey base (especially snowshoe hare and grouse) to serve the many species of predators that would benefit. The Ottawa's reduced timber harvesting is slowing recruitment of early-seral forest which is so important for producing abundant prey species for predators. An effort to increase the harvest to our desired quantity of early successional forest would certainly benefit a number of species.

Forest management practices are improving or maintaining adequate quality nesting habitat for both species of forest raptors. Selection harvest may displace individuals for periods, but within a short time frame (5 to 10 years), habitat is recovered and often of better quality for re-occupancy by breeding pairs. The fact that about half the acres of upland hardwoods, and half the total acres of the Ottawa are in the unsuited land base, assures that adequate nesting habitat is available for these hawks.

## **Literature Cited**

Bioregional Assessment of Northern Goshawk in the Great Lakes Bioregion. 2009.

Jason Bruggeman and Thomas Erdmann. Natural Resources Research Institute, University of Minnesota-Duluth.

Partners in Flight Assessment of Red-Shouldered Hawk. 2004. Available on the internet at [http://rmbo.org/pif\\_db/laped/](http://rmbo.org/pif_db/laped/).

### **Wood Turtle**

In FY 2009, the Ottawa completed the 5<sup>th</sup> consecutive year of monitoring selected nesting beaches for this riverine turtle. Wood turtles are RFSS on the Ottawa and surrounding National Forests, and are classified as a Species of Special Concern in Michigan and Threatened in Wisconsin. The Ottawa chose not to do a thorough report on this species this year, but rather, to await a thorough data analysis scheduled to be completed during the winter of 2010-2011, using 6 years of monitoring data. See the FY 2007 M&E Report for more information on the wood turtle (pp. 30-31).

### **Kirtland's Warbler**

The Kirtland's warbler (KW), a federally endangered species, is now known to be resident and breeding on the Ottawa. This species was long thought to be using regenerating stands of jack pine in the Baraga Plains area, and had been intermittently detected on the State of Michigan's Copper Country State Forest, immediately adjacent to jack pine stands owned and managed by the Ottawa. In 2008, a lone male KW was seen and heard singing on several occasions, but no female could be found. In spring of 2009 however, 2 and perhaps 3 different males were repeatedly seen singing, including 2 with females apparently nesting. During 2009, the Ottawa first began participating in the range-wide KW annual census, coordinated by the US Fish and Wildlife Service. Future plans include continued involvement in the annual KW census, implementation of jack pine management designed to create high-quality KW habitat specifically on the Baraga Plains, and consultation with US Fish and Wildlife Service regarding KW management on the Ottawa. More details can be found in the FY 2008 M&E Report.

## **Hazardous Fuels Objectives**

In FY 2009, the Ottawa accomplished its hazardous fuels target of 1,625 acres through a combination of mechanical treatments and prescribed burning operations. A Community Wildfire Protection Plan (CWPP) was completed across the state line with Wisconsin that involved numerous partners including two National Forests, two State DNRs, two townships, two counties, various local communities and volunteer fire departments. The "Stateline CWPP" as it was titled, identified a number of potential projects, including some related to hazardous fuels reduction. Efforts are underway to complete two additional CWPPs in other areas of the Forest in FY 2010 and it is anticipated with sufficient funding that the Ottawa could be completely covered with CWPPs by the end of FY 2011. Another of the Ottawa's fire program goals is to perform hazardous fuels risk assessments across the Forest as well as the development of a five-year fuels treatment plan in order to ensure that the highest risk acres are being treated. Work is currently underway to achieve these goals.

## **Use of Wildland Fire to maintain or restore natural ecosystem processes or functions**

In FY 2009, the Ottawa utilized prescribed fire as a tool to re-establish a jack pine barrens vegetation community on approximately 45 acres of a 138-acre barrens type opening on the Baraga Plains. Future fuels management objectives for the Ottawa include continued use of prescribed fire as a management tool to mimic natural processes.

In FY 2009, the Ottawa fire team responded to 22 wildland fires of varying causes. The total acreage burned was 27 acres.

There is currently an effort underway to work with our interagency partners to develop a long range plan for the entire 30,000 acre Baraga Plains ecosystem and it will likely include up to 9,480 acres of NFS land. This plan would seek to restore the jack pine ecosystem to a more natural vegetative composition to improve habitat conditions for native species, including rare plants, invertebrates and vertebrates.

## **Decommissioning of Unneeded Roads**

Approximately 140 miles of unneeded roads have been identified for decommissioning each year through the vegetative management planning process. Most of these roads receive little or no use and are decommissioning naturally by growing in on their own. Between 10% and 20% of these roads are being blocked using berms, stumps, boulders, culvert removal etc. to facilitate the "natural" process. Another 5% to 10% are decommissioned more extensively by not only blocking the entrances but also receiving additional culvert removals, water bars, riprap, scarifying, seeding & mulching and tree planting along the entire length of the roadway. Some examples of roads actively decommissioned in 2009 are a 0.25 mile segment of FR 5022 to inhibit unauthorized ATV use into an old growth area and a 0.5 mile segment of an unauthorized road which was not needed for access for the Jack Salvage Stewardship project.

**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 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 2010 have been outlined in the 2010 Monitoring Workplan (see Appendix 1 of this document for a listing of Monitoring Items we expect to address in the

2010 M&E Report). As in previous years, the 2010 Workplan will be 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.

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## Appendix 1 – Schedule for Forest Plan Monitoring and Evaluation

Monitoring Item # <sup>1</sup>	Monitoring Frequency	Evaluation Frequency	FY Scheduled	FY Last Accomplished	Monitoring Question
01	Annually	Annually	All	All	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	2009	To what extent do output levels and the mix of sawtimber and pulpwood compare to those levels projected?
04	Annually	Annually	All	All	Are insect and disease population levels compatible with objectives for restoring or maintaining healthy forest conditions?
05a	Annually	1 to 5 years	2011	2009	What are the effects of OHVs on the physical and social environment?
05b	Annually	1 to 5 years	2010	2009	How effective are forest management practices in managing OHV use?
05c <sup>2</sup>	Annually	1 to 5 years	2010	2009	To what extent are road and trail closures effective in prohibiting unauthorized motor vehicle use?
06	Annually	Annually	All	All	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	2013	2008	Are the effects of Forest management, including prescriptions, resulting in significant changes to productivity of the land?
10a	Annually	1 to 5 years	2011	2009	To what extent are forest management activities providing habitat for MIS (EPT).
10b	Annually	1 to 5 years	2011	2009	To what extent are forest management activities providing habitat for MIS (ruffed grouse).

<b>Monitoring Item #<sup>1</sup></b>	<b>Monitoring Frequency</b>	<b>Evaluation Frequency</b>	<b>FY Scheduled</b>	<b>FY Last Accomplished</b>	<b>Monitoring Question</b>
10c	Annually	1 to 5 years	2011	2009	To what extent are forest management activities providing habitat for MIS (American marten).
10d	Annually	1 to 5 years	2011	2009	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	2010	2009	To what extent is Forest management contributing or responding to non-native invasive plant species?
12b	Annually	1 to 5 years	2010	2009	To what extent is Forest management contributing or responding to non-native invasive animal species?
13	1 to 5 years	1 to 5 years	2010	2009	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	2011	2009	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	2011	2009	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	All	All	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?

<b>Monitoring Item #<sup>1</sup></b>	<b>Monitoring Frequency</b>	<b>Evaluation Frequency</b>	<b>FY Scheduled</b>	<b>FY Last Accomplished</b>	<b>Monitoring Question</b>
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 # <sup>1</sup>	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?
31a	1 to 5 years	1 to 5 years	2011	n/a	To what extent has management maintained or restored the diversity and abundance of native aquatic <i>flora</i> in streams and lakes in a manner consistent with the capability of the water body?
31b	1 to 5 years	1 to 5 years	2011	2009	To what extent has management maintained or restored the diversity and abundance of native aquatic <i>fauna</i> in streams and lakes in a manner consistent with the capability of the water body?
32	1 to 5 years	1 to 5 years	2011	n/a	To what extent are the key terrestrial 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	2011	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	2010	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	2012	2008	To what extent is forest management contributing or responding to the conservation of species of viability concern (such as Regional Forester's Sensitive Species) and moving toward desired habitat conditions for these species? (Botany)

<b>Monitoring Item #<sup>1</sup></b>	<b>Monitoring Frequency</b>	<b>Evaluation Frequency</b>	<b>FY Scheduled</b>	<b>FY Last Accomplished</b>	<b>Monitoring Question</b>
34b	5 years	5 years	2010	2002	To what extent is forest management contributing or responding to the conservation of species of viability concern (such as Regional Forester's Sensitive Species) and moving toward desired habitat conditions for these species? (black-backed woodpecker/spruce grouse)
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 Forester's Sensitive Species) and moving toward desired habitat conditions for these species? (black-throated blue warbler)
34d	Annually	1-5 years	2012	2009	To what extent is forest management contributing or responding to the conservation of species of viability concern (such as Regional Forester's Sensitive Species) and moving toward desired habitat conditions for these species? (common loon)
34e	Annually	1-5 years	2012	2009	To what extent is forest management contributing or responding to the conservation of species of viability concern (such as Regional Forester's Sensitive Species) and moving toward desired habitat conditions for these species? (Raptors)
34f	Annually	1-5 years	2010	2007	To what extent is forest management contributing or responding to the conservation of species of viability concern (such as Regional Forester's 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 Forester's Sensitive Species) and moving toward desired habitat conditions for these species? (Osprey)
35	1 to 5 years	1 to 5 years	2010	2009	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?

<b>Monitoring Item #<sup>1</sup></b>	<b>Monitoring Frequency</b>	<b>Evaluation Frequency</b>	<b>FY Scheduled</b>	<b>FY Last Accomplished</b>	<b>Monitoring Question</b>
36	1 to 5 years	1 to 5 years	2011	2008	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?
37	1 to 5 years	1 to 5 years	2011	2008	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	2012	2008	To what extent are OHVs producing impacts to wildlife or wildlife habitats?
39	1 to 5 years	1 to 5 years	2011	2008	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	2011	2008	To what extent has land ownership adjustment facilitated forest management activities?
41	1 to 5 years	1 to 5 years	2011	2009	To what extent is forest management meeting hazardous fuels objectives?
42	1 to 5 years	1 to 5 years	2011	2009	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	2010	2008	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	2011	2009	To what extent are unneeded roads being decommissioned?
44b <sup>2</sup>	1 to 5 years	1 to 5 years	2010	2008	To what extent are road closures on decommissioned roads effective in prohibiting unauthorized motor vehicle use

<sup>1</sup>The information in this table was taken from both Chapter 4 of the Forest Plan and the 2006 Monitoring Guide.

<sup>2</sup>Question #44b will be combined with Question 5c in the future due to redundancy; one discussion can be prepared for both questions.

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