



United States  
Department of  
Agriculture

Forest Service

# Huron-Manistee National Forests

## *2006 Monitoring & Evaluation Report*

*September 2007*



## Approval

I reviewed the FY 2006 Monitoring & Evaluation Report for the Huron-Manistee National Forests. This report documents the results of two Forest Plans—the concluding 1986 Forest Plan and the recently implemented 2006 Forest Plan. The 1986 Forest Plan was operational from October 1, 2005 to June 25, 2006. The 2006 Forest Plan was implemented on June 26, 2006. This Monitoring & Evaluation Report evaluates these results. This report meets the intent of both the Forest Plan and the regulations contained in 36 CFR 219 National Forest Management Act.

This report is approved:

/s/ Leanne M. Marten  
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Forest Supervisor

10-1-07

Date

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## Introduction and Forest Plan Overview

### Introduction

The Huron-Manistee National Forests are located between the shores of Lake Michigan and Lake Huron in the northern half of the Lower Peninsula of Michigan. The approximately one-million-acre Huron-Manistee National Forests are located in a transition zone between forested lands to the north and agricultural lands to the south. The Huron-Manistee National Forests are located within fourteen Michigan Counties, including Alcona, Crawford, Iosco, Ogemaw, Oscoda, Lake, Manistee, Mason, Mecosta, Montcalm, Muskegon, Newaygo, Oceana, and Wexford. The Forests have four ranger districts, including Cadillac-Manistee, Baldwin-White Cloud, Huron-Shores, and Mio.

### Forest Plan Overview

The Huron-Manistee National Forests released the Land and Resource Management Plan on March 20, 2006 with the signing of the Record of Decision. This was a revision of the Forest Plan completed in 1986. The Forest Plan provides guidance for all resource management activities occurring on the Huron-Manistee National Forests. The Forest Plan identifies management direction for the Huron-Manistee National Forests in the form of goals, objectives, desired future conditions, and standards and guidelines; all of which are based on underlying assumptions (policy, theory, data, and technology). To determine the usefulness of a Forest Plan, the National Forest Management Act (NFMA) regulations (36 CFR 219) have required regularly scheduled monitoring and evaluation.

## Purpose and Scope of the Monitoring & Evaluation Report

The Monitoring & Evaluation Report is a Management Attainment Report (MAR) and an annual output target for the Huron-Manistee National Forests, as it is for other Forests. The M & E report serves several other purposes, including:

-  Documenting monitoring and evaluation accomplishments,
-  Providing an accountability tool for monitoring and evaluation expenditures,
-  Providing an assessment of the current state of the Huron-Manistee National Forests,
-  Providing adaptive management feedback to Forest Supervisor of any needed changes to the Forest Plan or adjustments to management actions,
-  Describing to the public how their public lands are being managed.

This document is the first Monitoring and Evaluation Report compiled under the 2006 Huron-Manistee National Forests Forest Plan. Monitoring and evaluation is described in Chapter IV of the Forest Plan. Monitoring items are intended to address issues raised through public scoping and interdisciplinary team review. The Monitoring and Evaluation Report (M & E) provides an

opportunity to track progress towards the implementation of revised Forest Plan decisions and the effectiveness of specific management activities. The focus of the evaluation is in providing short and long-term guidance to ongoing management. The information gained from the M & E report is used to determine how well the desired conditions, goals, objectives, and outcomes of the Forest Plan have been met.

The Monitoring & Evaluation Report documents monitoring of the Forest Plan during fiscal year 2006. At this early point in the implementation of the revised Forest Plan, trends, patterns, and subsequent results will not be clearly defined. Therefore, extensive evaluations and conclusions that would lead to changes in the Forest Plan are not expected.

Monitoring and evaluation is a quality control process for implementation of the 2006 Forest Plan, providing the public, the Forest Service, and other concerned resource agencies with information on progress and results. The M & E report describes to the public how their public lands are being managed and how effectively the commitments made to them through the revised Forest Plan are being met. The M & E report also provides a readily available reference document for Forest Service managers as they plan, evaluate the effects of actions on resources, and implement future projects.

Monitoring and evaluation are divided into three broad categories and are designed to answer the following basic questions:

1. **Implementation Monitoring** – Did we do what we said we were going to do?  
This question answers how well the direction in the Forest Plan is being implemented. Collected information is compared to objectives, standards, guidelines and management area (MA) direction.
2. **Effectiveness Monitoring** – Did it work how we said it would?  
This question answers whether the application of standards and guidelines is achieving objectives, and whether objectives are achieving goals.
3. **Validation Monitoring** – Is our understanding and science correct?  
This question answers whether the assumptions and predicted effects used to formulate the goals and objectives are accurate.

The aim of monitoring is adaptive management—responding to current conditions or making appropriate changes based on new information or technology. Depending on the answers to the questions in the three types of monitoring above, the Forest Plan may be amended or revised to adapt to new information and changed conditions. The annual monitoring and evaluation report should include recommendations for remedial action, if necessary, to make management activities and their effects consistent with the Forest Plan. Specific recommendations for corrective action will depend on the risk to the resource and the type of disparity discovered. The types of action that could be recommended include:

-  No action, if monitoring and evaluation indicate that the standards and guidelines are being followed and the results are meeting Forest plan objectives.
-  Additional monitoring, if initial results are inconclusive or indicate a pattern of minor discrepancies between the standards and guidelines and their implementation, or between expected and actual results.

-  Referral to the appropriate line officer for action to ensure proper application of the standards and guidelines, if compliance is inconsistent.
-  Changing the projected output schedule, if it turns out to be unachievable given funding and other constraints.
-  Revising the budget, if the anticipated costs of implementation of the Forest Plan turn out to be incorrect.
-  Amending the Forest Plan to change, for example, the allocation of particular areas from one Land Use Designation to another, or changing one or more of the standards and guidelines.
-  Revising the Forest Plan if major changes are warranted.

Given that fiscal year (FY) 2006 was the first year the Forest Plan was implemented (at least partially) the type of initial monitoring is implementation monitoring. It is important to first ensure that the Forests are properly following the objectives, standards and guidelines established in the Forest Plan. Effectiveness and validation monitoring will become more prominent when the results of Forest Plan implementation become more apparent.

## An Overview of the Monitoring Program Design

The steps to successful monitoring include –

1. **Establish a Monitoring Budget:** As part of the annual program budgeting process, the Forests establish an annual monitoring budget to collect, manage, and evaluate data; coordinate with partners; produce the annual report; and fund the Monitoring Interdisciplinary Team.
2. **Identify a Monitoring ID Team:** Establish an ID Team with the authority to coordinate and supervise monitoring activities, administer monitoring funding, evaluate the data collected and produce the annual monitoring report.
3. **Develop a Monitoring & Evaluation Guide:** After the Forest Plan was completed, monitoring efforts focused primarily on the development of what the Forests will monitor in the next 10 to 15 years, the expected life of the Forest Plan, through development of a Monitoring Guide. The ID Team will annually review the current Monitoring Guide which was designed to facilitate data collection and storage on monitoring items using standardized monitoring protocols and corporate data/information storage.

Forest program managers and district specialists involved in monitoring and evaluation will refer to the Monitoring Guide to find the actual criteria to be used to measure or otherwise conduct monitoring and evaluation. The Monitoring Guide is intended to be a flexible component that could change as new methodologies and techniques are developed. In that approach, monitoring techniques could adapt to the rapid changes that occur under ecosystem management philosophies. The Monitoring Guide could change without amending the Forest Plan.

4. **Develop Cooperators:** The ID Team will recruit and manage cooperators who will aid in

data collection and possibly data evaluation. Cooperators will play a key role in a successful monitoring effort.

5. **Establish an Annual Monitoring Schedule:** The ID Team, under the direction of the Forests' Leadership Team, will develop a monitoring schedule within the budget provided. The monitoring schedule will identify the questions to be addressed for the year, the funding available, where data on monitoring items will be collected, and who will have the responsibility to obtain the data.
6. **Manage the Collection & Storage of Data:** The ID Team will work with Forest Service employees and cooperators to see that data is collected using standard methods found in the Monitoring Guide and entered into the appropriate corporate data storage system.
7. **Evaluate the Data:** The ID Team will evaluate the data collected with the goal of answering the monitoring questions.
8. **Publish & Distribute the Annual Monitoring Report:** The ID Team will write and distribute the annual monitoring report.

## Legally Required Monitoring

Minimum monitoring and evaluation requirements have been established through the NFMA at 36 CFR 219 (1982). Some requirements provide guidance for the development of a monitoring program, while others include specific compliance requirements. The minimum legally required monitoring tasks are identified as Category 1 elements, or required monitoring, in Table IV-3 of the Forest Plan. Table IV-3, Category 1 elements are shown below; some are covered in Section 2 of this document.

**Forest Plan Table IV-3. Monitoring Matrix.**

<b>Required Monitoring Items (Category 1)</b>					
<b>Resource Area</b>	<b>Monitoring Question(s)</b>	<b>Driver: Applicable Code of Federal Regulations (CFR)</b>	<b>Measurement Frequency</b>	<b>Evaluation/Reporting Frequency</b>	<b>Precision and Reliability Class</b>
All	Is the Forest Plan still relevant?	36 CFR 219.10(g). The Forest Supervisor shall review the conditions on the land covered by the plan at least every 5 years to determine whether conditions or demands of the public have changed significantly.	5 years	5 years	A and B
All	How close are projected outputs and services to actual?	36 CFR 219.12(k) [1]. A quantitative estimate of performance comparing outputs and services with those projected by the Forest Plan.	Annual	Annual	A
All	How close are projected costs with actual costs?	36 CFR 219.12(k) [3]. Documentation of costs associated with carrying out the planned management prescriptions as compared with costs estimated in the Forest Plan.	Annual	Annual	A
Insects and Diseases	Are insects and disease organisms increasing to potentially damaging levels following management activities?	36 CFR 219.12(k) [5] [iv]. Destructive insects and disease organisms do not increase to potentially damaging levels following management activities.	5-10 years	5-10 years	B

**Forest Plan Table IV-3. Monitoring Matrix (Continued).**

Required Monitoring Items (Category 1)					
Resource Area	Monitoring Question(s)	Driver: Applicable Code of Federal Regulations (CFR)	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
Social and Economic Stability	What are the effects of Forest management being planned on land, resources and communities adjacent to or near the National Forest? What are the effects on National Forest management from activities on nearby lands managed by other Federal or other governmental agencies or under the jurisdiction of local governments?	36 CFR 219.7(f). A program of monitoring and evaluation shall be conducted that includes consideration of the effects of National Forest Management on land, resources, and communities adjacent to or near the National Forest being planned and the effects upon National Forest management from activities on nearby lands managed by other Federal or other government agencies or under the jurisdiction of local governments.  36 CFR 219.12(k) [1]. A quantitative estimate of performance comparing outputs and services with those projected by the Forest Plan.	Annual	Annual	A and B
Soils	Are the effects of Forest management, including prescriptions, resulting in significant changes to productivity of the land?	36 CFR 219.12 (k) [2]. Documentation of the measured prescriptions and effects, including significant changes in productivity of the land.	1-5 years	1-5 years	A and B
Timber	Are harvested lands adequately restocked after five years?	36 CFR 219.12(k) [5] [i]. Lands are adequately restocked as specified in the Forest Plan.	Annual	Annual	A

**Forest Plan Table IV-3. Monitoring Matrix (continued).**

Required Monitoring Items (Category 1)					
Resource Area	Monitoring Question(s)	Driver: Applicable Code of Federal Regulations (CFR)	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
Timber	To what extent is timber management occurring on lands suitable for such production?	36 CFR 219.12(k) [5] [ii]. Lands identified as not suited for timber production are examined at least every 10 years to determine if they have become suited; and that, if determined suited, such lands are returned to timber production.	10 years	10 years	A
Timber	How much even-aged management (especially clearcutting) should be used, and in what forest types should it be used?	36 CFR 219.12(k) [5] [iii]. Maximum size limits for harvest areas are evaluated to determine whether such size limits should be continued.	10 years	10 years	A
Timber	Is the timber product mix and timber output at, or below, levels defined in the Timber Resource Sale Schedule?	36 CFR 219.16. Timber Resource Sale Schedule.	Annual	Annual	A
Wildlife: Management Indicator Species	What are the population trends of management indicator species? What are the relationships of the population trends to habitat changes?	36 CFR 219.19(a) (6). Population trends of the management indicator species will be monitored and relationships to habitat changes determined. This monitoring will be done in cooperation with state fish and wildlife agencies, to the extent practical.	Annual	1-5 years	A and B
All	What are the identified research needs?	36 CFR 219.28. Research needs for management of the National Forest System shall be identified during planning and periodically reviewed during evaluation of implemented plans.	Annual	5 years	A and B

## **Monitoring Attainment of Goals, Implementation of Standards & Guidelines, and Effects of Prescriptions and Management Practices**

In addition to minimum or required monitoring items, discussed above, there are monitoring items that are intended to address issues brought forth through public involvement and interdisciplinary team review, including:

- Category 2 – Attainment of goals and objectives, and desired future condition,
- Category 3 – Implementation of standards and guidelines,
- Category 4 – Effects of Prescriptions and management practices.

Forest goals are broad statements describing conditions the Huron-Manistee National Forests will strive to achieve, Chapter II, Forest Plan. They are not meant to be measured directly and there are no specific time frames for achieving them. Forest objectives are clear and specific statements of planned results to be achieved within a state time period. Standards are required action or resource status designed to meet the desired conditions and objectives. Guidelines are preferred action used to reach desired conditions and objectives. A desired future condition is the hoped-for results to be achieved through the implementation of the Forest Plans in both the short- and long-term that will sustain ecological conditions and meet human needs, now and in the future.

These monitoring tasks are also identified in Table IV-3 of the Forest Plan. Table IV-3, Category 2, 3, and 4 elements are shown below; some are covered in Section 3 of this document.

**Forest Plan Table IV-3. Monitoring Matrix.**

<b>Desired Condition and Objective Monitoring Items (Categories 2, 3 and 4)</b>					
<b>Resource Area</b>	<b>Monitoring Question(s)</b>	<b>Driver: Applicable Code of Federal Regulations (CFR), Forest Plan Desired Condition or Forest Plan Objective</b>	<b>Measurement Frequency</b>	<b>Evaluation/Reporting Frequency</b>	<b>Precision and Reliability Class</b>
All	What Standards, Guidelines or objectives are not being met?	36 CFR 219.12 (k). At intervals established in the plan, implementation shall be evaluated on a sample basis to determine how well objectives have been met and how closely management standards and guidelines have been applied. Based upon this evaluation, the inter-disciplinary team shall recommend to the Forest Supervisor such changes in management direction, revision or amendments to the Forest Plan as are deemed necessary.	Annual	Annual	A and B
Wildlife and Vegetation Management	What are the amounts, distribution, and types of available habitats?	Wildlife and Rare Plants: Provide for the sustainability of terrestrial and aquatic ecosystems at multiple scales.	Annual	1-5 years	A and B
Wildlife and Vegetation Management	Are minimum viable populations of appropriate native and desirable non-native species being maintained within the planning area?	Wildlife and Rare Plants: Maintain minimum viable populations of appropriate native and desirable non-native species within the planning area.	Annual	1-5 years	A and B
Timber, Wildlife and Fire	What mix of harvest products by timber type will be produced? What is the mix as to non-chargeable versus chargeable?	Timber Management: Sell products as the result of ecosystem restoration, fire hazard reduction, and timber management.	Annual	1-5 years	A and B

**Forest Plan Table IV-3. Monitoring Matrix (Continued).**

<b>Desired Condition and Objective Monitoring Items (Categories 2, 3 and 4)</b>					
<b>Resource Area</b>	<b>Monitoring Question(s)</b>	<b>Driver: Applicable Code of Federal Regulations (CFR), Forest Plan Desired Condition or Forest Plan Objective</b>	<b>Measurement Frequency</b>	<b>Evaluation/Reporting Frequency</b>	<b>Precision and Reliability Class</b>
Wildlife and Watershed	How many acres of the Forest have been inventoried and classified using an approved Aquatic Ecological Classification System?	Riparian and Aquatic Resources: Base the management of the aquatic resources upon an Aquatic Ecological Classification System.	Annual	1-5 years	A and B
Wildlife and Vegetation Management	How many acres of early successional habitat in riparian areas occur on each Forest? Does this level of habitat provide adequate species viability?	Riparian and Aquatic Resources: Employ active management for early successional habitat if natural disturbance processes are not providing adequate habitat for species viability concerns.	Annual	1-5 years	A and B
Recreation	How many areas and how many acres of semiprimitive nonmotorized and motorized areas are being provided?	Recreation, Semiprimitive Areas and Access: Provide for semiprimitive nonmotorized and motorized recreational experience.	Annual	1-5 years	A

**Forest Plan Table IV-3. Monitoring Matrix (Continued).**

<b>Desired Condition and Objective Monitoring Items (Categories 2, 3 and 4)</b>					
<b>Resource Area</b>	<b>Monitoring Question(s)</b>	<b>Driver: Applicable Code of Federal Regulations (CFR), Forest Plan Desired Condition or Forest Plan Objective</b>	<b>Measurement Frequency</b>	<b>Evaluation/Reporting Frequency</b>	<b>Precision and Reliability Class</b>
Fire	What is the distribution of National Forest System acres by fire hazard rating? How many acres in fire-dependent ecosystems and at-risk urban-rural interface and intermix areas have been reduced by at least one hazard rating class?	Wildland Fire and Fuel Management: Manage hazardous fuels in fire-dependent ecosystems and at-risk urban-rural interface and intermix areas.	Annual	1-5 years	A
Fire	What is the distribution of National Forest System acres by fire condition class? How many acres have been treated that result in an improvement of at least one fire condition class? What is the number and size of wildfires?	Wildland Fire and Fuel Management: Reduce wildland fire intensities and the number of catastrophic fires.	Annual	1-5 years	A
Non-Native Invasive Species	To what extent is forest management contributing or responding to populations of terrestrial/aquatic non-native invasive species of concern?	Executive Order #13112; R-9 Non-Native Invasive Species Strategy.	1-5 years	1-5 years	A and B

In addition to the goals and objectives identified in Table IV-3, Chapter II of the Forest Plan enumerates further goals and objectives and are shown in the table below:

**Table 1. Forestwide Goals and Objectives.**

<b>Forest Plan, Chapter II – Health and Safety Goals</b>	
<b>Goal Number</b>	<b>Goal Narrative</b>
G-H&S-1	<ul style="list-style-type: none"> <li>• Suppress wildfires using an appropriate management response, in a manner compatible with Management Area objectives. Prevention, pre-suppression and suppression activities will be based on analysis of past fire occurrence, fire intensities and values at risk.</li> </ul>
G-H&S-2	<ul style="list-style-type: none"> <li>• Encourage adequate fire prevention, fire-safe construction and presuppression activities on private lands in wildland/urban interface fire prone areas.</li> </ul>
G-H&S-3	<ul style="list-style-type: none"> <li>• Fire suppression activities should be the least impacting to the environment while providing for safety, but still achieve the objectives of fire suppression.</li> </ul>
G-H&S-4	<ul style="list-style-type: none"> <li>• Suppress fires occurring on private lands inside the Forests' fire protection boundary as defined under established agreements.</li> </ul>
G-H&S-5	<ul style="list-style-type: none"> <li>• Create agreements for fire detection and suppression on National Forest System lands with cooperating firefighting agencies to define suppression actions commensurate with established resource management prescriptions.</li> </ul>
G-H&S-6	<ul style="list-style-type: none"> <li>• Fire use is suitable on National Forest System lands. Fire use will, to the extent possible, mimic natural processes to accomplish resource objectives, while protecting wilderness values and cultural, historical and developed resources.</li> </ul>
G-H&S-7	<ul style="list-style-type: none"> <li>• Implement fuels reduction and fuelbreak projects where conditions warrant for the protection of life, property and safety. High-risk areas adjacent to private land will receive treatment priority.</li> </ul>
G-H&S-8	<ul style="list-style-type: none"> <li>• Provide for the protection of National Forest System lands and for the property and safety of users.</li> </ul>
G-H&S-9	<ul style="list-style-type: none"> <li>• Provide for Law Enforcement and compliance patrols based on user activity and resource protection needs.</li> </ul>
G-H&S-10	<ul style="list-style-type: none"> <li>• Maintain a transportation system that meets health and safety, resource and administrative needs.</li> </ul>

**Table 1. Forestwide Goals and Objectives (continued).**

<b>Forest Plan, Chapter II – Public Relations and Partnerships Goals</b>	
<b>Goal Number</b>	<b>Goal Narrative</b>
G-PR&P-1	<ul style="list-style-type: none"> <li>• Work to achieve informed public consent during development and implementation of land and resource management plans and programs.</li> </ul>
G-PR&P-2	<ul style="list-style-type: none"> <li>• Through information programs, explain the correlation of resource management direction and activities with public interests and concerns. Design programs and information based on audience analyses as well as land and resource needs.</li> </ul>
G-PR&P-3	<ul style="list-style-type: none"> <li>• Cooperate with and encourage agencies, tribes, states, counties and other partners in education and outreach.</li> </ul>
G-PR&P-4	<ul style="list-style-type: none"> <li>• Implement a public information and education program to explain areas of special significance in coordination with other public and private organizations to reduce the number, intensity and cost of conflict-producing and resource-damaging situations.</li> </ul>
G-PR&P-5	<ul style="list-style-type: none"> <li>• Work with affected American Indian tribes in a government-to-government relationship.</li> </ul>
G-PR&P-6	<ul style="list-style-type: none"> <li>• Use a combination of personal contacts, brochures, maps and informational signing to inform and educate users about forest management.</li> </ul>
G-PR&P-7	<ul style="list-style-type: none"> <li>• Identify and publicize resource management opportunities that will help volunteer organizations, individuals and local communities enhance their self-sufficiency and social well-being.</li> </ul>
G-PR&P-8	<ul style="list-style-type: none"> <li>• Integrate public involvement and forest management with regional and national objectives.</li> </ul>
G-PR&P-9	<ul style="list-style-type: none"> <li>• Work to acquire public input and participation in a timely manner in developing programmatic and site-specific environmental resource management analyses.</li> </ul>

**Table 1. Forestwide Goals and Objectives (continued).**

<b>Forest Plan, Chapter II – Natural Resources Goals</b>	
<b>Goal Number</b>	<b>Goal Narrative</b>
G-NR-1	<ul style="list-style-type: none"> <li>• Monitor and evaluate effectiveness of management practices.</li> </ul>
G-NR-2	<ul style="list-style-type: none"> <li>• Manage designated old growth across all management areas and vegetation classes emphasizing old growth characteristics.</li> </ul>
G-NR-3	<ul style="list-style-type: none"> <li>• Integrate the Scenery Management System (see Forest Plan Appendix F-Glossary for definitions) into project-level planning.</li> </ul>
G-NR-4	<ul style="list-style-type: none"> <li>• Meet species viability needs, achieve fire hazard reduction, and accomplish fiber production from regulated (Allowable Sale Quantity) and non-regulated (non-chargeable) forest lands primarily through timber harvest.</li> </ul>
G-NR-5	<ul style="list-style-type: none"> <li>• Monitor wildlife responses to management practices using identified Management Indicator Species to determine the effects of management practices on wildlife and fish populations.</li> </ul>
G-NR-6	<ul style="list-style-type: none"> <li>• Reduce non-native invasive species infestations and prevent new invasive species from becoming established, when possible.</li> </ul>
G-NR-7	<ul style="list-style-type: none"> <li>• Wildlife and fisheries habitats and plant communities shall be managed to maintain viable populations of existing native and desired non-native species.</li> </ul>
G-NR-8	<ul style="list-style-type: none"> <li>• Maintain or improve the populations of endangered, threatened or sensitive species or communities.</li> </ul>
G-NR-9	<ul style="list-style-type: none"> <li>• Manage the 5-mile (8 km) radius around Tippy Dam to benefit the Indiana bat.</li> </ul>
G-NR-10	<ul style="list-style-type: none"> <li>• Restore and maintain savannahs, prairies, dry grasslands, mesic grasslands, shrub/scrub and oak-pine barrens in areas where they were known to previously occur, to provide for habitat diversity and to meet species viability needs.</li> </ul>
G-NR-11	<ul style="list-style-type: none"> <li>• Utilize prescribed fire to meet management direction as appropriate for the ecosystems involved.</li> </ul>

**Table 1. Forestwide Goals and Objectives (continued).**

<b>Forest Plan, Chapter II – Natural Resources Goals (continued)</b>	
<b>Goal</b>	<b>Goal Narrative</b>
G-NR-12	<ul style="list-style-type: none"> <li>• Encourage cooperation and coordination with responsible government land and resource management agencies, tribes and partners in program management such as recreation; Wild and Scenic River and State Natural Rivers; minerals; air quality; law enforcement, fire; water quality; endangered, threatened, and sensitive species; non-native invasive species and insect and disease.</li> </ul>
G-NR-13	<ul style="list-style-type: none"> <li>• Cooperate with individuals; organizations and local, state, Tribal and federal governments to promote ecosystem health and sustainability across landscapes.</li> </ul>
G-NR-14	<ul style="list-style-type: none"> <li>• Manage riparian areas consistent with resource conditions, management objectives and designated water use. Reduce nonpoint pollution to the maximum extent feasible and protect the hydrologic functions of watersheds, including both surface and groundwater systems.</li> </ul>
G-NR-15	<ul style="list-style-type: none"> <li>• Manage vegetation within the Streamside Management Zone for late seral stages through natural successional processes emphasizing the retention of a sufficient number of trees to protect water quality and provide a source of recruitment for large wood to the adjacent aquatic system.</li> </ul>
G-NR-16	<ul style="list-style-type: none"> <li>• Monitor and measure effects at the 5th or 6th level watershed.</li> </ul>
G-NR-17	<ul style="list-style-type: none"> <li>• Manage oligotrophic lakes with 100 percent of National Forest ownership so as not to change the trophic status; allow no more than a 10-percent decline in trophic status in other oligotrophic lakes and lakes with a mesotrophic status; lakes with a eutrophic status will maintain fishable and swimmable waters.</li> </ul>
G-NR-18	<ul style="list-style-type: none"> <li>• In cooperation with permittees, favor selective treatment of vegetation in transmission line rights-of-way to improve wildlife forage.</li> </ul>

**Table 1. Forestwide Goals and Objectives (continued).**

<b>Forest Plan, Chapter II – Natural Resources Goals (continued)</b>	
<b>Goal</b>	<b>Goal Narrative</b>
G-NR-19	<ul style="list-style-type: none"> <li>National Forest System lands will be available for non-surface-disturbing mineral exploration and extraction.</li> </ul>
G-NR-20	<ul style="list-style-type: none"> <li>Mineral exploration and development occurs and is consistent with management area direction and subject to valid existing rights. Appropriate restrictions are placed in leases to protect the environment.</li> </ul>
G-NR-21	<ul style="list-style-type: none"> <li>Protect the rights of the federal government, encourage inventory and development of federal minerals, respect state and private mineral rights, and ensure operators take reasonable and prudent measures to prevent unnecessary disturbance to the surface.</li> </ul>
G-NR-22	<ul style="list-style-type: none"> <li>Minimize or prevent the development of pest problems. Where pest problems are unavoidable, select the solution which provides the most benefits while meeting control objectives.</li> </ul>
G-NR-23	<ul style="list-style-type: none"> <li>Land adjustments (purchase or exchange) will consider only the interest needed to achieve land management objectives and must satisfy one or more of the following purposes: (1) accomplish objectives of public law or regulation; (2) obtain land needed to meet demands for National Forest System resources; (3) result in more efficient land ownership patterns as indicated by reduced resource management costs.</li> </ul>
G-NR-24	<ul style="list-style-type: none"> <li>The priority for land acquisition is to purchase lands or partial interests needed to protect endangered, threatened, and sensitive species and areas possessing unique natural environments or significant cultural resources.</li> </ul>
G-NR-25	<ul style="list-style-type: none"> <li>Reduce the net miles of roads on the Forests by emphasizing closures of roads determined to be non-essential for resource management.</li> </ul>
G-NR-26	<ul style="list-style-type: none"> <li>Locate administrative boundaries of recreation areas and place informative signs describing appropriate activities for the area.</li> </ul>
G-NR-27	<ul style="list-style-type: none"> <li>Cooperate with local communities when considering site-specific proposals that would provide access to services in the local communities.</li> </ul>
G-NR-28	<ul style="list-style-type: none"> <li>Provide for a combination of motorized and nonmotorized recreation opportunities.</li> </ul>

**Table 1. Forestwide Goals and Objectives (continued).**

<b>Forest Plan, Chapter II – Natural Resources Goals (continued)</b>	
<b>Goal</b>	<b>Goal Narrative</b>
G-NR-29	<ul style="list-style-type: none"> <li>• Provide a variety of access opportunities for a range of user abilities consistent with management area direction and Standards and Guidelines.</li> </ul>
G-NR-30	<ul style="list-style-type: none"> <li>• Design and manage trails for a primary seasonal use, to discourage conflicting uses. Prevent motorized and nonmotorized uses from occurring at the same time during any season of the year. Trails may also have secondary uses.</li> </ul>
G-NR-31	<ul style="list-style-type: none"> <li>• Manage Off-Highway Vehicles, including snowmobiles, by designating trails or routes to minimize user conflicts and to provide for user satisfaction, resource protection and public health and safety.</li> </ul>
G-NR-32	<ul style="list-style-type: none"> <li>• Emphasize levels 1, 2 and 3 facilities for developed and dispersed recreation.</li> </ul>
G-NR-33	<ul style="list-style-type: none"> <li>• Manage National Recreation Trails, Byways, Rivers, and Wildernesses in accordance with the commitments associated with their designation.</li> </ul>
G-NR-34	<ul style="list-style-type: none"> <li>• Integrate historical, environmental and cultural information into plans, assessments, analyses and decision documents, as appropriate.</li> </ul>
G-NR-35	<ul style="list-style-type: none"> <li>• Emphasize and promote the use of carry-out methods of trash disposal.</li> </ul>
G-NR-36	<ul style="list-style-type: none"> <li>• All management activities should meet or exceed the Scenic Integrity Objectives established for the Forests through the Scenery Management System.</li> </ul>

**Table 2. Forestwide Desired Future Conditions**

<b>Forest Plan, Chapter II – Desired Future Condition Goals</b>	
<b>Desired Future Condition</b>	<b>Desired Future Condition Narrative</b>
DFC-1	<ul style="list-style-type: none"> <li>All management activities provide for safe conditions for the public and employees.</li> </ul>
DFC-2	<ul style="list-style-type: none"> <li>Recreation management provided is compatible with the Recreation Opportunity Spectrum objectives.</li> </ul>
DFC-3	<ul style="list-style-type: none"> <li>The North County National Scenic Trail is constructed and administered as a premier hiking and backpacking trail. The trail will highlight significant scenic, historic, natural and cultural qualities.</li> </ul>
DFC-4	<ul style="list-style-type: none"> <li>Designated National Wild, Scenic, and Recreation Rivers are managed according to the management plan for the individual river.</li> </ul>
DFC-5	<ul style="list-style-type: none"> <li>The total of early successional habitat less than or equal to 15 years, and open-land habitat, such as agricultural, urban development and roads, should generally not exceed 66 percent of the area within any 6th level watershed on the forests. In most cases, 6th level watersheds have an area up to 40,000 acres associated with a creek and tributary.</li> </ul>
DFC-6	<ul style="list-style-type: none"> <li>Areas with unique character are protected.</li> </ul>
DFC-7	<ul style="list-style-type: none"> <li>Prairies, savannahs, and oak-pine barrens have been restored and maintained on approximately 10,000 acres within old-growth areas.</li> </ul>
DFC-8	<ul style="list-style-type: none"> <li>Maintain favorable conditions of water flow and quality. Management practices will not result in a long-term decline in water quality conditions.</li> </ul>
DFC-9	<ul style="list-style-type: none"> <li>Indiana bat, Karner blue butterfly, bald eagle, Kirtland's warbler, piping plover and Pitcher's thistle are managed according to their recovery plans.</li> </ul>
DFC-10	<ul style="list-style-type: none"> <li>Severe and moderately eroding streambanks are restored.</li> </ul>
DFC-11	<ul style="list-style-type: none"> <li>Habitat needs of riparian-dependent species are met and that habitat is maintained, especially habitat for threatened, endangered and sensitive species.</li> </ul>
DFC-12	<ul style="list-style-type: none"> <li>The cumulative amount of streamside stabilization over time does not exceed five percent of the total shoreline length of a river system within National Forest System boundaries.</li> </ul>
DFC-13	<ul style="list-style-type: none"> <li>In-stream large wood meets objectives stated in Table II-2, Forest Plan.</li> </ul>

**Table 3. Desired Future Condition for Large Wood from the Forest Plan, Chapter II, Table II-2.**

Stream Order	Number of Large Wood Structures per 300 Feet
1-2	6-9 (108-160 per mile)
3-4	3-6 (54 -108 per mile)
DFC-14	<ul style="list-style-type: none"> <li>Vegetation Composition objectives for the end of the first decade are displayed in the Forest Plan, Table II-3.</li> </ul>

**Table 4. Vegetation Composition Objectives (End of the First Decade) from the Forest Plan, Chapter II, Table II-3.**

Vegetation Class	Huron National Forest	Manistee National Forest
	Percent	Percent
Aspen/Birch	16-22	10-16
Barrens and Savannahs	1-3	2-5
High-Site Oaks	5-11	15-21
Lowland Conifers	2-8	0-5
Lowland Hardwoods	1-4	4-10
Long-lived Conifers	15-21	17-23
Low-Site Oaks	12-18	13-19
Northern Hardwoods	2-8	8-14
Openings	4-9	4-10
Short-lived Conifers	18-24	2-8

**Table 5. Additional Forest Plan Goals**

Add-1	National Visitor Use Monitoring Study
MA 9.2, DFC	Complete the evaluation of the study rivers—White and Little Manistee Rivers—and suitability evaluation of the Muskegon River, Little Muskegon River and Pine River Addition.

## **FY 2006 Huron-Manistee National Forests Monitoring & Evaluation Report**

This report is divided into three sections:

- Section 1 reviews several key events that took place on the Forests in FY 2006,
- Section 2 addresses monitoring items that are required by the National Forest Management Act (NFMA), and
- Section 3 presents the results of monitoring guided by attainment of goals and objectives, implementation of standards and guidelines, and the effects of prescriptions and management practices.

### **Section 1 – Key Events on the Huron-Manistee National Forests**

#### **Monitoring and Evaluation Guide Development**

Upon the completion of the 2006 Forest Plan, development of the Monitoring and Evaluation Guide (M & E Guide) was the next remaining task. While currently in draft form, the M & E Guide is meant to provide specific technical guidance that describes how, where, and when to accomplish Forest Plan prescribed monitoring, including methods, protocols, and analytical procedures. The M & E Guide is intended to be flexible and easily modified to respond to new information, updated procedures, breaking issues, and budgetary considerations—without amending the Forest Plan. The M & E Guide is not a decision document, i.e., it is not intended that all monitoring items will be implemented as budgetary constraints affect the level of monitoring that can be done in any given fiscal year.

#### **The Forests' Recreational Niche**

The recreational niche of the Huron-Manistee National Forests is to provide quality recreation opportunities on nationally recognized rivers, trails, and special areas, motorized and nonmotorized trail systems, and some areas where forest visitors have a probability to recreate away from the sights and sounds of human activities.

The Huron-Manistee National Forests have qualities and resources that support our recreational niche, including:

-  Designated and proposed Wild and Scenic Rivers, the North Country National Scenic Trail, Lumberman's Monument Visitor Information Center, Nordhouse Dunes Wilderness, River Road National Scenic Byway, and Loda Lake Wildflower Sanctuary offering recreationists experiences in natural settings.

-  Trail systems supported by a network of partners assisting in the construction and maintenance of motorized and nonmotorized trails.
-  Blocks of land designated for semiprimitive management that provide areas for recreationists seeking the probability of a more remote experience. Blocks of land designated as roaded natural for recreationists seeking those types of experiences.
-  Camping, trailheads, water access sites, and day use areas that support water-based and trail-based recreation opportunities.

## Fulfilling the Niche

The National Recreational Visitor Use Study (as amended) determined that approximately three-million people visited the Huron-Manistee National Forests during 2001. The majority of the recreational visits were associated with viewing scenery and escaping fast-paced lifestyles. The Forests' Recreational Niche is intended to focus management efforts and funding priorities based on the primary reasons people recreate on the Forests. Management direction at underutilized developed recreation sites may include reduced services, redesign for underserved recreation demands, or site closure.

Fulfilling the Forests' Recreational Niche will provide benefits to the administration of the recreation program and the public that is served. The recreational niche will be dynamic and consistently monitored to aide management of the forest resources in consideration of public demands and trends. The expected benefits of fulfilling the Recreation Niche include:

- Protecting and enhancing the values of nationally designated areas,
- Providing quality motorized and nonmotorized trail opportunities,
- Providing semiprimitive and roaded natural recreational opportunities,
- Providing local residents with a channel to connect with the land and each other through a sense of place,
- Cultivating and perpetuating strong partnerships to enhance recreation opportunities and visitor experiences throughout the Forests,
- Reducing conflicts between the various recreational visitor groups through facility and trail design,
- Promoting public acceptance and support for National Forest management through partnerships, education, and interpretation,
- Enhancing the local nature based tourism economy,
- Adjusting recreation sites strategically to ensure coordination to the extent feasible with other public/private recreation providers as well as improve the management efficiency of Forest facilities.

## Travel Management Rule

Over the past few decades, the availability and capability of Off Highway Vehicles has increased tremendously. More Americans are enjoying access and recreational opportunities on their national forests and grasslands, in keeping with the Forest Service's multiple-use mandate. However, the increase in OHV use can also affect soil, water, wildlife habitat, and other recreational visitors.

On November 9, 2005, the Forest Service announced final travel management regulations governing OHVs and other motor vehicle use on national forests and grasslands. The final rule requires each national forest and grassland to designate those roads, trails, and areas open to motor vehicle use. Designated routes and areas will be identified on a motor vehicle use map. Motor vehicle use outside of designated routes and areas will be provided for fire, military, emergency, and law enforcement purposes and for use under Forest Service permit. Valid existing rights are honored. The rule also maintains the status quo for snowmobile use, as determined in individual forest plans. The rule itself does not designate roads or areas for motor vehicles but provides a framework for making those decisions at the local level.

The rule's goal is to secure a wide range of recreation opportunities while ensuring the best possible care of the land.

### Highlights of the Travel Management Rule

- The rule requires each national forest or ranger district to designate those roads, trails, and areas open to motor vehicles.
- Designation will include class of vehicle and, if appropriate, time of year for motor vehicle use. A given route, for example, could be designated for use by motorcycles, ATVs, or street-legal vehicles.
- Once designation is complete, the rule will prohibit motor vehicle use off the designated system or when inconsistent with the designations.
- Designation decisions are made locally with public input and coordination with state, local, and tribal governments.

### **Kirtland's Warbler Survey**

Michigan is home to the Kirtland's warbler, one of the world's rarest birds. This small, energetic bird was one of the first to be listed as endangered after the Endangered Species Act of 1973 was passed by Congress. One reason this bird is endangered is the extremely limited area in which it nests—young jack pine forests growing on a special type of sandy soil in northern lower Michigan. Most of these nesting areas are in Crawford, Oscoda, and Ogemaw counties. Partners with the Huron-Manistee National Forests working to save the Kirtland's warbler from extinction include, U.S. Fish and Wildlife Service, Michigan Department of Natural Resources, and Michigan Audubon Society.

Survey information taken in June 2006 indicates the state's population of the endangered Kirtland's warbler is increasing. Biologists, researchers and volunteers in Michigan observed 1,478 singing males during the 2006 official census period. This number exceeds the 1,415 males observed in 2005, and represents the largest number recorded since monitoring began. The census was started in 1951, and has been conducted annually since 1971. The lowest numbers were recorded in 1974 and 1987, when only 167 singing males were found.

The 2006 census was a joint effort by the Michigan Department of Natural Resources, U.S. Forest Service, U.S. Fish and Wildlife Service, Michigan Department of Military Affairs and citizen volunteers. Singing males (numbers in parentheses) were found in 11 northern Lower Peninsula counties: Alcona (170), Clare (137), Crawford (276), Grand Traverse (2), Iosco (168), Kalkaska (4), Montmorency (10), Ogemaw (493), Oscoda (149), Otsego (35) and Roscommon (13). Surveyors identified 21 singing males in four Upper Peninsula counties: Chippewa (5), Delta (7), Marquette (3) and Schoolcraft (6). Females were observed with the males, indicating

continuing nesting activity in the Upper Peninsula. In addition to the birds counted in Michigan, four singing males were observed in Wisconsin in 2006.

## Section 2 – Legally Required Monitoring

**Monitoring Item:** Comparison of Projected and Actual Outputs and Services

**Monitoring Question(s):** How close are the projected outputs and services to actual?

**Monitoring Driver(s):** 36 CFR 219.12(k) [1]. Table IV-3, Category 1. A quantitative estimate of performance comparing outputs and services with those projected by the Forest Plan.

**Evaluation and Conclusions:** The information shown in the next two tables was obtained from the final Fiscal Year Performance Accomplishment Report, August 2006. Additional timber information is shown in other sections of the M & E Report.

Management Activity or Practice	Unit of Measure (per year)	Projected Average Annual Amount in the First Decade	FY 2006 Actual
<b>Wildlife and Fish</b>			
Manage Terrestrial Habitat	Acres	7,000	1,000
Manage Stream Habitat	Miles	121	33
Manage Lake Habitat	Acres	240	16
<b>Nonnative Plant Species</b>			
Manage Noxious Weeds	Acres	4,000	70
<b>Range</b>			
Manage Rangeland Vegetation	Acres	312	0
<b>Fuels</b>			
Hazardous Fuels Reduction	Acres	8,000	4,546
Fuelbreaks	Acres	2,000	0
<b>Watersheds</b>			
Maintain and Improve Watershed Condition	Acres	100	26
<b>Facilities</b>			
Decommission Classified and Unclassified Roads	Miles	20	22.7
Improve Transportation System – Roads	Miles	6	358
Improve Transportation System – Trails	Miles	38	180
<b>Vegetation</b>			
Establish Forest Vegetation	Acres	5,990	4,300
Improve Forest Vegetation	Acres	935	0

**Table 7. Actual Activities Funded and/or Accomplished During Fiscal Year 2006.**

Accomplishment Description	Unit of Measure	FY 2006 Accomplishment
Facilities maintained to standard	Number	262
Grazing allotments with signed decision notices	Number	1
Land adjustment – acquired or conveyed	Acres	0
Land adjustment – acquired or donated	Acres	741.22
Oil and gas applications processed within prescribed timeframes	Percent	59

**Table 8. Average Annual Timber Production Volume by Vegetation Class, FY 2006.**

Vegetation Class	Forest Plan Average Annual Harvest Projection, 1 <sup>st</sup> Decade	Sold Volume	Harvested Volume
MMBF			
Aspen/Birch	27.1	5.1	3.8
Short-lived Conifer	10.9	7.8	6.6
Long-lived Conifer	30.7	16.6	17.4
Low-site Oak, High-site Oak, and Northern Hardwoods	22.3	4.9	5.3
Firewood	Included in vegetation classes	5.7	5.7
Total	91.0	40.1	38.8

Sold and harvest volumes are 44 percent and 43 percent of those projected in the Forest Plan, as shown in Table 8. In FY 2006, the Forests offered approximately 51 MBF, but were only able to sell about 34 MBF. Seventeen timber sales were offered and six were no bid; or 35.3 percent. All of the no bid sales were predominantly jack pine or aspen sales. The primary factor in the significant amount of no bid sales was the closure of the Gaylord-based Georgia-Pacific mill, the largest pulpwood mill in the area; and the combination of the large jack pine component in the timber sales offered. Even though there was a significant drop in jack pine and aspen markets in FY 2006, the Forests were able to move timber sales because of the Forests’ trend toward offering larger sales, containing varied species.

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**Table 9. Average Annual Acres of Proposed and Probable Silvicultural Methods in the First Decade from Lands Suitable for Timber Production.**

Vegetation Class	Thin		Clearcut		Shelterwood		Selection	
	Projected in the Forest Plan	Actual Accomplished FY 2006	Projected in the Forest Plan	Actual Accomplished FY 2006	Projected in the Forest Plan	Actual Accomplished FY 2006	Projected in the Forest Plan	Actual Accomplished FY 2006
Aspen/birch	0	7	2,410	782	0	0	0	0
Short-lived conifer	0	4	1,417	940	0	18	0	0
Long-lived conifer	3,543	2066	163	129	0	62	0	0
Low-site oak		20	524	197	0	320	0	0
High-site oak	2,402	100	0	33	826	66	0	0
Northern hardwood	0	0	0	0	0	0	0	0
Total	5,945	2,197	4,514	2,081	826	466	0	0

**Table 10. Average Annual Acres of Proposed and Probable Silvicultural Methods in the First Decade from Lands Not Suitable for Timber Production.**

Vegetation Class	Create Barrens		Create Openings		Old Growth to Barrens		Old Growth Restoration	
	Projected in the Forest Plan	Actual Accomplished FY 2006	Projected in the Forest Plan	Actual Accomplished FY 2006	Projected in the Forest Plan	Actual Accomplished FY 2006 <sup>1</sup>	Projected in the Forest Plan	Actual Accomplished FY 2006 <sup>2</sup>
Aspen/birch	0	0	0	0	0	0	0	0
Short-lived conifer	13	0	199	0	0	0	0	0
Long-lived conifer	425	0	530	0	0	56	0	264
Low-site oak	79	0	80	0	0	0	0	0
High-site oak	255	0	0	0	0	0	0	0
Northern hardwood	0	0	0	0	0	0	0	0
Total	772	0	809	0	0	56	0	264

1) and 2) Progress toward second decade projections as shown in Appendix D, Proposed and Probable Practices, Goods Produced and Other Information, page D-4, Table D-5, of the 2006 Forest Plan.

**Monitoring Item: Control of Destructive Insects and Disease Organisms – Detection**

**Monitoring Question(s):** Are insects and disease organisms increasing to potentially damaging levels following management activities?

**Monitoring Driver(s):** 36 CFR 219.12(k) [5] [iv]. Table IV-3, Category 1. Destructive insects and disease organisms do not increase to potentially damaging levels following management activities.

**Background:** Each year the Michigan Department of Natural Resources (DNR) conducts aerial surveys to monitor forest health. This aerial survey is used to monitor the most apparent effects of damage agents to forest health. The 2006 Michigan Forest Health Highlights report may be found at: [http://fhm.fs.fed.us/fhh/fhh\\_06/mi/mi\\_06.pdf](http://fhm.fs.fed.us/fhh/fhh_06/mi/mi_06.pdf).

Threats to the Huron-Manistee National Forests include:

- Hemlock Woolly Adelgid
- Emerald Ash Borer
- Beech Bark Disease
- Sirex Wood Wasp
- Gypsy Moth
- Jack Pine Budworm
- Oak Wilt
- Hemlock Looper
- Red-headed Pine Sawfly

**Evaluation and Conclusions:****Hemlock Woolly Adelgid**

The hemlock woolly adelgid (HWA) has been in the United States since 1924. This introduced insect, believed to be a native of Asia, is a serious pest of eastern hemlock and is considered a major threat to the hemlock resource in the Great Lakes region. Infested hemlocks eventually die in four to ten years. HWA was identified in Emmet County in 2006 and is the third time the pest has been detected in Michigan in 20 years of surveying activities for the pest. The previous two findings occurred in 2001. However, this is the first time HWA has been found on native hemlock.

The Michigan Forest Health, Inventory and Monitoring Program, completed Hemlock Woolly Adelgid Rapid Early Detection Surveys for the fourth straight year as a USDA Forest Service funded Forest Health Evaluation Monitoring project. Areas with abundant hemlock near recreation sites and sites adjacent to nurseries were surveyed for presence of HWA. No adelgids were found as a result of this survey in 2006.

**Emerald Ash Borer**

Emerald ash borer (EAB) is an exotic beetle that was discovered in southeastern Michigan in 2002. The adult beetles nibble on ash foliage but cause little damage. However, the larvae (the immature stage) feed on the inner bark of ash trees, disrupting the tree's ability to transport water and nutrients. Since its discovery, EAB has killed more than 20 million ash trees in

Michigan, Ohio and Indiana with most of the devastation in southeastern Michigan. EAB continued expanding its range in 2006.

### **Beech Bark Disease**

Beech bark disease (BBD) was discovered in Ludington State Park in 2000 and has expanded very slowly in the west-central Lower Peninsula, including the west side of the Huron-Manistee National Forests. Mason, Oceana, Muskegon, and Wexford Counties have suffered beech mortality. Beech bark disease starts when a scale insect (*Cryptococcus fagisuga* Lind.) pierces the bark. Next, a type of Nectria fungi invades the bark, eventually killing the tree. The disease is thought to be spread by transporting campfire wood, birds, and wind.

### **Sirex Wood Wasp**

The Sirex wood wasp has been confirmed at trap sites throughout the eastern Great Lakes region of Ontario, Canada since its detection in New York State in 2004, the first time the insect was documented in North American forests. The wood wasp usually confines its attacks to dead or dying trees in its native areas of Europe, Asia, and northern Africa. However, in the Great Lakes area, it is a major pest of pine plantations, attacking living trees and causing up to 80 percent mortality. Outbreaks often build up in stressed trees and then spread to more vigorous trees.

In a pest risk assessment for North America it has been rated a “very high risk” pest. Female Sirex horntails are attracted to stressed trees where they insert their sword-like ovipositors into the outer sapwood, deposit their eggs and introduce a toxic mucus and fungus (*Amylostereum areolatum*). Larvae feed only on the fungus, which, together with the mucus, kills infested trees.

In Michigan, scotch, jack, red and Austrian pines are considered susceptible. In 2006, Michigan began participating in a cooperative international detection monitoring program for Sirex. Traps were placed in high-risk pine stands in the southeast and north central Lower Peninsula and monitored regularly. No Sirex wood wasps were collected. Additional traps will be set in 2007.

### **Gypsy Moth**

Michigan, overall, experienced only 31,545 acres of gypsy moth defoliation compared with 148,525 in 2005. The probable cause for the downturn was cool, wet spring weather favorable to the development of the fungal pathogen, *Entomophoga maimaiga*. Increased soil moisture also helped reduce stress on defoliated trees. There will be no cooperative gypsy moth treatments conducted in 2007 due to declining populations and reduced federal funding.

### **Jack pine Budworm**

Jack pine budworm is the most significant pest of jack pine in North America. For the third year in a row, extensive jack pine budworm defoliation was reported across many areas in the Lake States. Michigan experienced 151,000 acres of jack pine defoliation in 2006. Jack pine budworm outbreaks normally terminate after 1-3 years, limiting damage during any one outbreak. So, in areas that have seen 2-3 years of consecutive defoliation, populations are not expected to drop in 2007. All of the Lake States National Forests had some significant jack pine budworm defoliation in 2006, including the Huron side of the Huron-Manistee National Forests.

### **Oak Wilt**

Oak wilt pockets are very common in many parts of the Lake States, but are not found on most National Forest lands in the area. Unfortunately, the range of oak wilt appears to be expanding northward with an increasing number of pockets on the Huron-Manistee National Forests. Three sites currently exist on the Forests, including Island Lake and Wagner Lake Campgrounds

on the Huron National Forest and Sand Lake Campground on the Manistee National Forest. Root grafting makes this disease difficult to manage, one dead tree generally leads to groups of dead trees. One possible explanation of the expanding range of oak wilt is the movement of the fungus via firewood.

Current treatment involves the use of a vibratory plow with a 6-foot blade to create barriers. Symptomatic trees within the barrier are usually cut and burned and remaining trees monitored. The Chequamegon-Nicolet National Forest near Lakewood, Wisconsin is testing an alternate method of treatment and is being evaluated for possible testing in Michigan in 2007. In place of a vibratory plow, the alternate method involves breaking root grafts by physically removing stumps with a large backhoe. Indications are that the method is cost-effective and can slow or stop the progression of oak wilt below ground for at least 3 years.

### **Hemlock Looper**

Hemlock looper larvae can be extremely destructive to hemlock, balsam fir, and white spruce. Hemlocks may die after one year of severe defoliation; fir in one or two years. Loopers have been epidemic in isolated areas of the state in the last few years. This has resulted in thin crowns, top kill and tree mortality. Populations moved from the eastern Upper Peninsula to areas of Northern Lower Michigan in 2006. Because loopers first feed on lower branches, it is difficult to detect feeding damage with aerial surveys until trees are heavily damaged.

### **Red-Headed Pine Sawfly**

The Red-Headed Pine Sawfly defoliates ornamental, natural-growing, and plantation pines. Heaviest infestations are commonly on pines growing under stress, particularly those at the edges of hardwood forests, on poor soils, and where there is heavy competitive vegetation. The sawfly primarily infests trees less than 15 feet tall. Top kill and tree mortality results where there is heavy defoliation. Lesser defoliation stunts height growth and results in forking of the main stem. Sawfly populations have been active in the eastern Upper Peninsula and the northern Lower Peninsula beginning in 2002.

The Huron-Manistee National Forests will continue to monitor overall insect and disease conditions, particularly non-native insects and diseases such as jack pine budworm, emerald ash borer and beech bark disease. Cooperative efforts will continue with the state of Michigan to monitor the extent of emerald ash borer.

## **Monitoring Item: Timber – 5-year Restocking**

**Monitoring Question(s):** Are harvested lands adequately restocked after five years?

**Monitoring Driver(s):** 36 CFR 219.12(k) [5] [i]. Table IV-3, Category 1. Lands are adequately restocked as specified in the Forest Plan.

**Background:** National Forest Management Act regulations require cutover lands to be adequately restocked within five years. Regeneration occurs naturally (typically aspen), or by planting (red pine) or seeding (jack pine).

**Monitoring Activities:** Stocking surveys were conducted on 3,148 acres in FY 2006. Acres that do not have adequate stocking will be reexamined and a determination made as to which of these lands are necessary to reforest.

**Evaluation and Conclusions:** In FY 2006, 1,931 acres were certified as satisfactorily stocked. Table 11 indicates the classifications of the certifications.

Type of Regeneration	Acres
Natural Regeneration with Site Preparation	963
Natural Regeneration without Site Preparation	301
Planted Areas	667
Seeded Areas	0
Total	1,931

Source: FACTS Web Report: Table 21, Certification of reforestation and TSI acres.

**Monitoring Item:** Timber – Product Mix, Timber Resource Sale Schedule

**Monitoring Question:** Is the timber product mix and timber output at, or below, levels defined in the Timber Resource Sale Schedule?

**Monitoring Driver(s):** 36 CFR 219.16. Table IV-3, Category 1. Timber Resource Sale Schedule.

**Background:** On-going timber program of harvest activities.

**Monitoring Activities:** Measured through FACTS and TSA (Timber Sale Accounting) reports

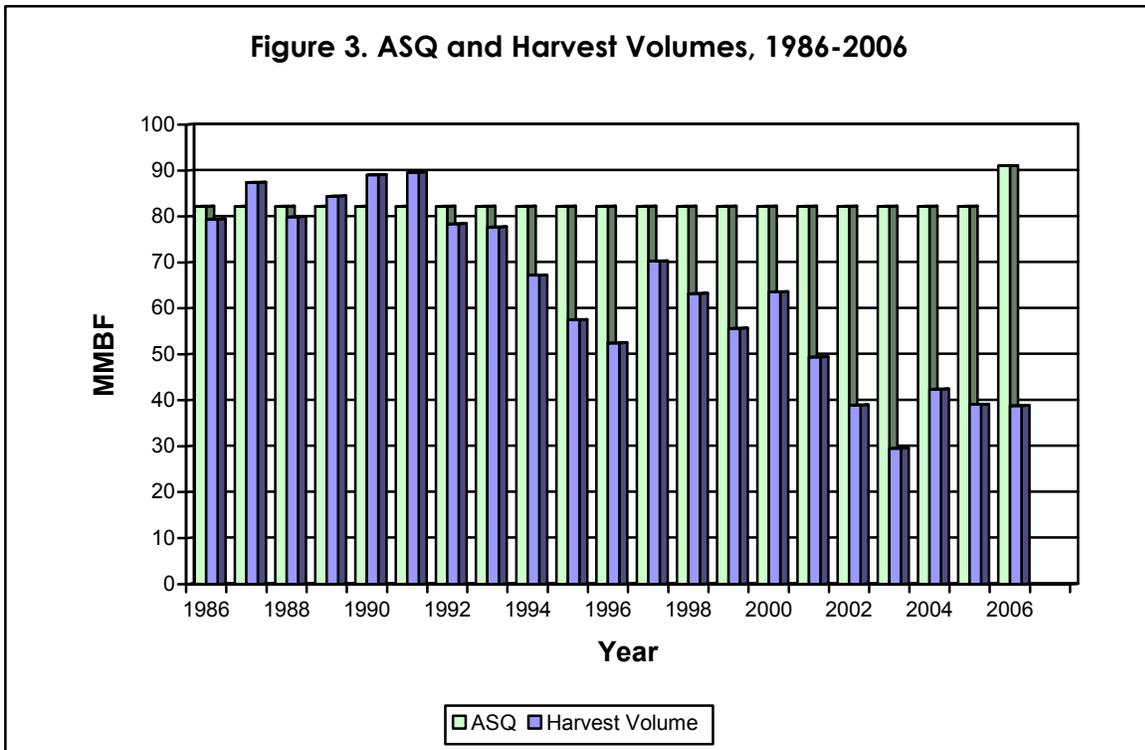
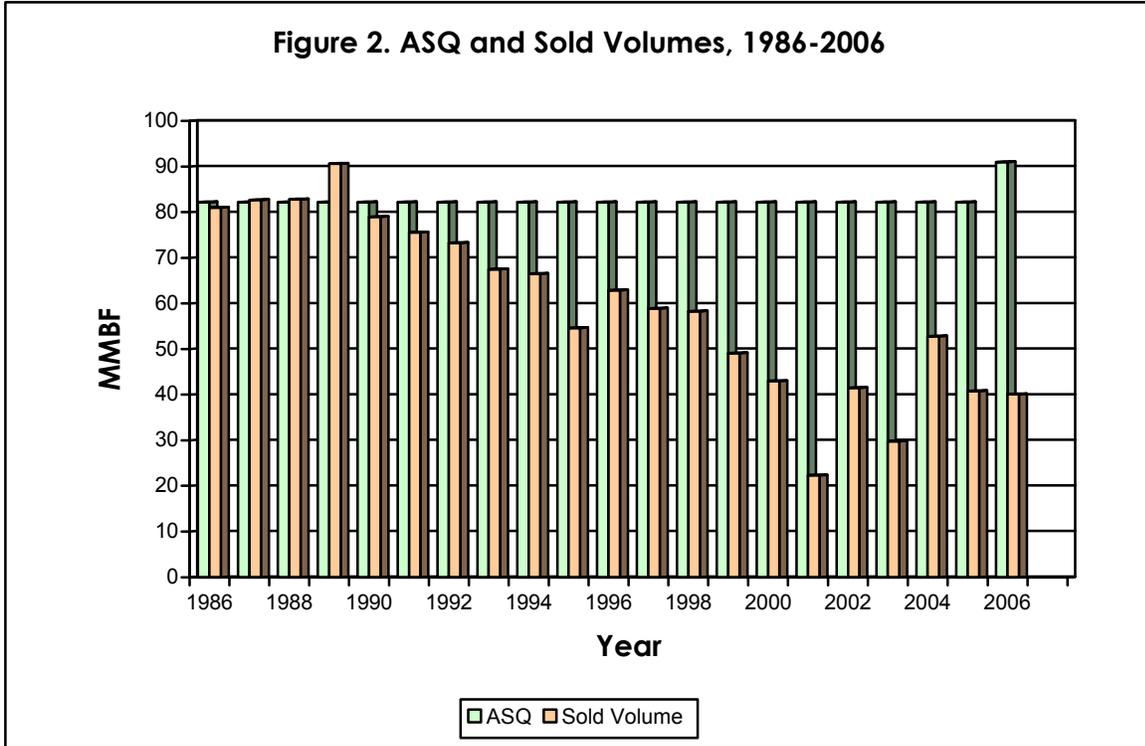
**Evaluation and Conclusions:** The 1986 Forest Plan set a maximum Allowable Sale Quantity (ASQ) of 82.2 MMBF (million board feet) per year for the first decade and 123.6 MMBF for the second decade. For the 20-year period of the 1986 Forest Plan, fiscal years 1986-2005, the sold volume was 1,213 MMBF, or approximately 74 percent of the first decade ASQ. The Forests have not exceeded the ASQ, or the demand for timber.

The 2006 Forest Plan established an allowable sale quantity (ASQ) of 91 MMBF per year. In FY 2006, the Forests’ sold 40.1 MMBF or 44 percent of the ASQ [38.8 MMBF was harvested in 2006].

<b>Fiscal Year</b>	<b>Sold</b>
1986	81
1987	82.7
1988	82.8
1989	90.6
1990	79
1991	75.6
1992	73.3
1993	67.5
1994	66.5
1995	54.6
1996	62.9
1997	58.9
1998	58.3
1999	49.1
2000	43
2001	22.3
2002	41.5
2003	29.8
2004	52.8
2005	40.8
Total – 1986 Forest Plan	1213
Total – 1986 Forest Plan, MMBF/Year	60.7
<b>2006</b>	<b>40.1</b>
Total	1253.1

The Forests' intent is to implement the recommendations in the 2006 Forest Plan, resulting in a change in desired vegetation conditions of the 1986 Forest Plan.

Figure 2 and Figure 3 compare sold volumes and harvest volumes with Annual Sale Quantity (ASQ).



**Monitoring Item: Population Trends of Management Indicator Species**

**Monitoring Question(s):** What are the population trends of management indicator species (MIS)? What are the relationships of the population trends to habitat changes? MIS species include: Ruffed Grouse, Brook Trout, Mottled Sculpin, Bald Eagle, Kirtland's Warbler, Karner Blue Butterfly.

**Monitoring Driver(s):** 36 CFR 219.19(a) (6). Table IV-3, Category 1. Population trends of the management indicator species will be monitored and relationships to habitat changes determined. This monitoring will be done in cooperation with state fish and wildlife agencies.

G-NR-5, Forestwide Goal: Monitor wildlife responses to management practices using identified Management Indicator Species to determine the effects of management practices on wildlife and fish populations.

**Background:** For MIS, population estimates are made from aerial surveys, track surveys, nest counts, mark-recapture techniques or other population survey methods appropriate for quantifying the size of populations.

The Forest Plan identified 6 terrestrial wildlife species to serve as Management Indicator Species (Ruffed Grouse, Brook Trout, Mottled Sculpin, Bald Eagle, Kirtland's Warbler, Karner Blue Butterfly). These species were selected because they represent particular environmental conditions for a variety of species needing similar habitat conditions. Monitoring the quantity and quality of habitat and population trends for Management Indicator Species helps assess how well we are maintaining habitat and viability of all species.

The Forests have collected monitoring data for a variety of habitat conditions and population trends for Management Indicator Species. Strategies and Populations Trends for Bald Eagle, Karner Blue Butterfly and Kirtland's Warbler are reported above, under Endangered, Threatened and Sensitive species. Monitoring, inventories, and data collection for Endangered, Threatened, and Regional Forester's Sensitive species covered Indiana Bat, Piping Plover, and Pitcher's Thistle, as well. In addition, we have worked with the Michigan Department of Natural Resources and other groups to monitor and evaluate Black Bear, American Woodcock, Eastern Pipitrelle, Wood Turtle, Northern Goshawk, Red-shouldered Hawk, American Marten, and sensitive plant species.

**Monitoring Activities:**

**Bald Eagle, Karner Blue Butterfly and Kirtland's Warbler** monitoring results are reported under Endangered, Threatened and Sensitive species.

**Brook Trout and Mottled Sculpin**

The following protocol was developed in FY 2006 and is in the preliminary stage of being implemented. It is anticipated that the protocol will be implemented in FY 2007 on about three streams.

A Management Indicator Habitat (MIH) approach will be used to monitor brook trout and mottled sculpin habitat and population trends. The State of Wisconsin has developed a "biotic integrity index for coldwater streams" (Lyons et al. 1996; Wang et al. 1997). The authors felt that the characteristics of Wisconsin coldwater streams are representative of coldwater streams in northern Michigan. Thus, the Wisconsin Index of Biotic Integrity (IBI) will be used to

monitor habitat for coldwater stream ecosystems on the Huron-Manistee National Forests. This methodology will be used on representative wadable forested, coldwater streams on the National Forests. It is a relative easy procedure that entails electro-fishing a 300-600 foot section (single pass) to obtain an accurate and representative sample of the entire fish assemblage in this section. Data is then assessed as described by Lyons et al. (1996) to obtain the IBI. Ideally the stream section should be at least 35X the average stream width and never less than 300 feet. A number of representative stations across the National Forest will be established. These representative streams will be chosen according to the following:

- Predominantly National Forest ownership within watershed – thus, any changes in the IBI can be attributed to land use practices on upstream National Forest system lands (as opposed to outside sources of variation and human disturbance beyond the control of the Forest Service).
- Small to medium sized, wadable streams that can be efficiently electrofished to obtain an accurate sampling of the entire fish population.

Application of the Wisconsin IBI on representative Management Indicator Habitat (coldwater stream ecosystems) will be done concurrently with the brook trout – mottled sculpin Management Indicator Species (MIS) monitoring.

The following streams will be used for MIH and MIS purposes (Table 9). While 17 streams in seven different watersheds will be monitored, sampling will be spread out over a five-year period on a rotational basis (average of three streams per year; thus, each stream will be sampled at least three times during the 10-15 year Forest Plan implementation).

**Table 14. Streams on the Huron-Manistee National Forests serving as Management Indicator Habitat (MIH) and brook trout – mottle sculpin Management Indicator Species (MIS) locations. MIH will be monitored using the Wisconsin Index of Biotic Integrity (IBI).**

Stream	Location		
	National Forest	Watershed	County
Cedar Creek	Manistee	Big South Pere Marquette River	Newaygo
Mena Creek <sup>1</sup>	Manistee	White River	Newaygo
Peterson Creek	Manistee	Manistee River	Wexford/Manistee
Pine Creek <sup>2</sup>	Manistee	Manistee River	Manistee
Poplar Creek	Manistee	Pine River	Wexford
Douglas Creek	Huron	Au Sable River	Crawford
Blockhouse Creek	Huron	Au Sable River	Oscoda
Ninemile Creek	Huron	Au Sable River	Oscoda
Hoppy Creek	Huron	Au Sable River	Alcona/Iosco
McDonald Creek	Huron	Au Sable River	Alcona
Roy Creek	Huron	Au Sable River	Alcona
Loud Creek	Huron	Au Sable River	Alcona
Buck Creek	Huron	Tawas River	Iosco
Gordon Creek	Huron	Tawas River	Iosco
Loud Creek	Huron	Tawas River	Iosco
Indian Creek	Huron	Tawas River	Iosco
Vaughn Creek	Huron	Au Gres River	Iosco

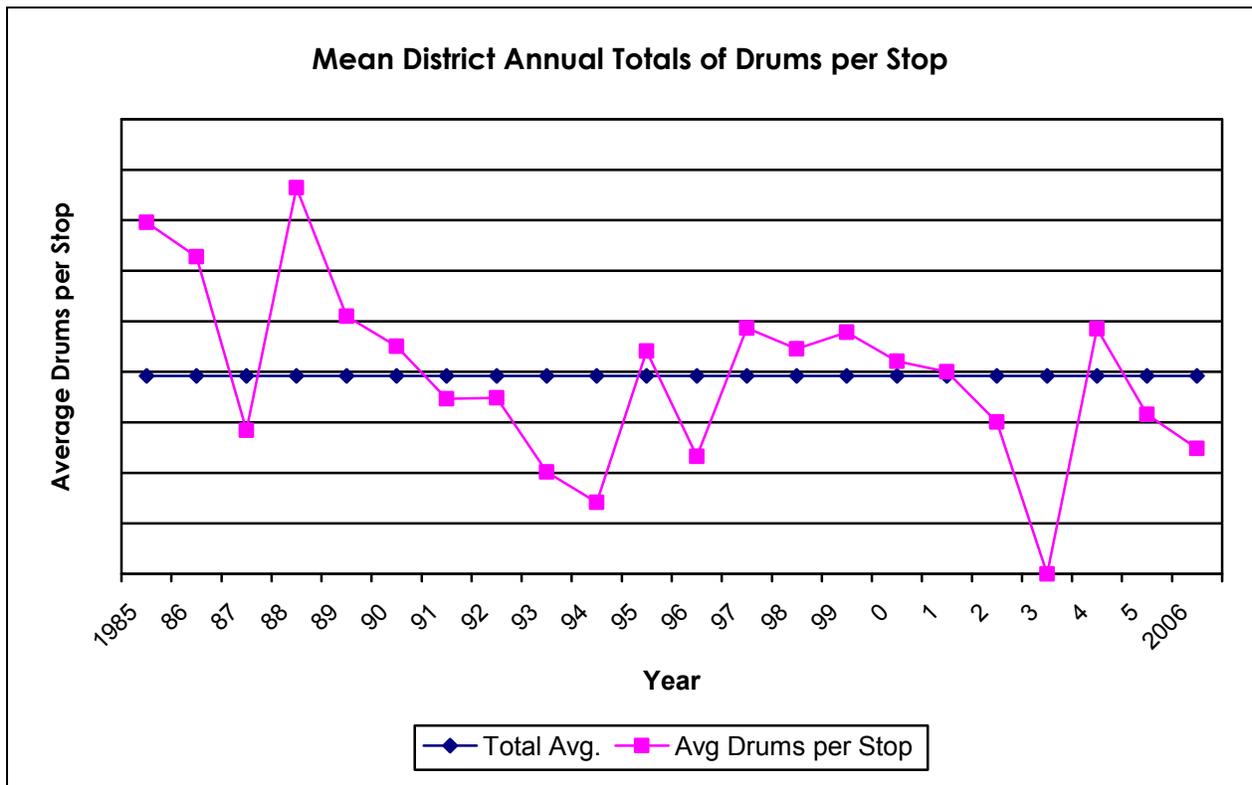
<sup>1</sup> Mena Creek will be sampled upstream of the impoundment (Minnie Pond).

<sup>2</sup> Pine Creek will be sampled upstream of Steinberg Road.

**Ruffed Grouse**

Ruffed Grouse are monitored by spring “drumming” count surveys, by Forest staff, volunteers, and Tribal participants. Each route of 17 to 20 “stops” (10 “stops” on Tribal survey routes) is run three times between mid-April and late May, listening away from the vehicle for 4 minutes at each permanently-marked “stop”, and recording the number of drums heard. “Drums per stop” is the index of grouse drumming activity compared from route-to-route and year-to-year. Forest Service staff and volunteers monitor Grant Township, Kellogg Tower and Pine River routes; Tribal surveyors assess the Wagon Wheel route on NFSL, as well as 1836 Reservation, 1855 Territory, and Thompsonville routes.

In 2006, drums per stop averaged only 0.25 on Forest Service routes, the lowest index since 1996. This may be due to the well-known “ten-year cycle” in ruffed grouse numbers, with similar oscillations suggested in this graph of previous drumming counts:



By contrast, Tribal counts averaged 1.17 drums per stop, and Wagon Wheel route counts averaged 0.67 drums per stop, in an area managed specifically for ruffed grouse.

**Evaluation and Conclusions:**

Existing information suggests that most forest vegetation type acres are consistent with the projections in the Forest Plan. Less early successional habitat is being managed for Management Indicator Species, while the amount of late successional habitat for Management Indicator Species is increasing proportionally. Jack pine type is approximately 20,000 acres less than in 1986 and projected for the Year 2035. Forest data and information on jack pine type indicate a shift to short-lived oak.

The Forests continue to look for ways to improve gathering better vegetation information and improving the functionality of databases.

## Section 3 – Attainment of Goals, Implementation of Standards & Guidelines, and Effects of Prescriptions and Management Practices

### Monitoring Item: Fisheries Management – Standards & Guidelines Application

Three applications exist under this monitoring item:

**#1 – Monitoring Question:** What standards and guidelines or objectives are not being met?

**Monitoring Driver(s):** 36 CFR 219.12 (k). Table IV-3, Category 1. At intervals established in the Forest Plan, implementation shall be evaluated on a sample basis to determine how well objectives have been met and how closely management standards and guidelines have been applied.

Aquatic Restoration Guideline, page II-20, Chapter II, Forest Plan: Natural, in-stream or added wood–trees, shall be left undisturbed unless they constitute a navigational hazard. If watercraft cannot go over, under or around wood, it constitutes a navigational hazard and may be cut only to the extent necessary for navigation.

**Background:** There exists on-going coordination with primary river users (liveries and commercial outfitter guides) to balance navigational clearing with aquatic habitat maintenance.

One of the challenges in river maintenance and riparian corridor management is how we look at large wood and logjams in our rivers. In the recent past, logjams were thought to be a significant problem and were completely removed from stream channels. Logjams help reduce erosion, provide habitat for fish and wildlife and are an important part of the natural processes of a river system. It is recommended to leave most logjams in place. Large wood management is the process of determining what to about wood in the river; move, remove or add, and how best to accomplish the work.

**Evaluation and Conclusions:** Monitoring of existing large wood in the Pine River indicates that a significant portion shows evidence of having been cut to some degree for watercraft passage. There was an estimated 1,435 total log jams in the 26-mile National Scenic River corridor (75 per mile). Fifty-two percent show evidence of some degree of cutting (Stuber et al. 2006). This ongoing removal could lead to cumulative adverse effects on hydrological and biological processes, and as such, there continues to be on-going coordination with primary river users to balance navigational clearing with aquatic habitat maintenance.



Implementation of Forest Plan guidelines for large wood clearing in navigable streams has improved since the Forest Service and the primary river users (liveries and guides) began cooperatively clearing those log jams that are true navigation hazards two years ago. Continuation of this effort should mitigate the potential cumulative effects of long-term clearing.



**#2** – **Monitoring Question:** What standards and guidelines or objectives are not being met?

**Monitoring Driver(s):** 36 CFR 219.12 (k). Table IV-3, Category 1. At intervals established in the plan, implementation shall be evaluated on a sample basis to determine how well objectives have been met and how closely management standards and guidelines have been applied.

DFC -13, Forestwide Desired Future Condition: Are instream objectives for large wood being implemented? Forest Plan DFC-13 calls for the restoration of large wood to meet the desired future conditions (54 – 108 pieces per miles in large streams, 108 – 160 pieces per mile in smaller streams).

G-NR-15, Forestwide Goal: Manage vegetation within the Streamside Management Zone for late seral stages through natural successional processes emphasizing the retention of a sufficient number of trees to protect water quality and provide a source of recruitment for large wood to the adjacent aquatic system.

**Background:** Historical records and photographs suggest that large wood in streams played an important role in the structure and function of aquatic ecosystems of the watersheds of the Forests. This wood plays an important role in channel morphology, being one of the channel-forming agents. It provides habitat diversity, cover for fish, habitat for invertebrates, reptiles and other components of the aquatic food chain. Wood also adds nutrients to the aquatic system and protects streambanks during high flow events. Current-day levels of large wood in aquatic ecosystems on the Huron-Manistee National Forests are much lower due to: (1) historic, wholesale removal to facilitate log transport (log drives); (2) cutting of the pre-Euro-American forest (removal of the source for future recruitment); (3) reduced levels of recruitment from second growth riparian forests, and (4) to facilitate passage of recreational watercraft.

**Monitoring Activities:** Two types of monitoring occurred: (1) actual counts of large wood placed in previous years as part of large scale restoration projects; and, (2) counts of large wood in navigable streams.

Monitoring was done to: (1) estimate the retention of large wood from whole trees placed in the Au Sable and Manistee Rivers; and, (2) to determine the extent of navigational clearing in the Pine River.

Monitoring was done by enumeration of amounts of wood in selected streams through actual counts while floating the rivers.



The monitoring was accomplished by the U.S. Forest Service and other partners in the actual restoration of large wood (Conservation Resource Alliance, Huron Pines RC&D Council, Michigan Department of Natural Resources).

**Evaluation and Conclusions:** Based on the counts of wood in the Manistee and Au Sable Rivers, the majority of trees have stayed in place. Those that have moved are still in the system, usually incorporated as part of larger log jams. The placed trees have weathered well and blended in with their natural surroundings. These findings are consistent with more quantitative GIS-based monitoring that was done previously (Hudy et al. 2005).



Based on the Pine River counts of large wood (Stuber et al. 2006), the average of 75 log jams per mile falls within the prescribed range for large streams on the Huron-Manistee National Forests.

It was observed that clusters of placed trees fared better than individually placed trees in both the Au Sable River and Manistee River large wood restoration projects. Placed hardwood trees blended in sooner, although placed red pine did weather after a few years, looking more natural.

#### **References:**

- Hudy, M.X., R. J. Stuber, H.E. Jennings, W. P. Fowler, and M.P. Joyce. 2005. A GIS-based system to monitor whole trees placed in the Au Sable and Manistee Rivers, Michigan. Proceedings from the 66<sup>th</sup> Annual Midwest Fish and Wildlife Conference, Grand Rapids, MI (abstract only).
- Stuber, R.J., M.P. Joyce, and M. Tonello. 2006. The effects on long-term navigational clearing on large wood abundance in the Pine River, Michigan. Proceedings from the 136<sup>th</sup> Annual Meeting of the American Fisheries Society, Lake Placid, NY (abstract only).

**#3** – **Monitoring Question:** What Standards, guidelines or objectives are not being met?

**Monitoring Driver(s):** 36 CFR 219.12 (k). Table IV-3, Category 1. At intervals established in the plan, implementation shall be evaluated on a sample basis to determine how well objectives have been met and how closely management standards and guidelines have been applied.

E 2, Brook Trout Conservation Activity, page II-33, Chapter II, Forest Plan: Provides a guideline that at least 34% of a sixth level watershed should be maintained in a forested state greater than a 15-year age class.

**Methods:** In the NEPA process, an analysis of a project's effect on the percentage of the watershed in open condition and/or in forest cover in less than 15-year age class is conducted. Methodologies used for this analysis range from ocular estimates of maps and aerial photos to GIS analysis of a proposed project's direct, indirect, and cumulative effects on a watershed.

**Evaluation and Conclusions:** Implementation of Forest Plan guidelines for sixth level watersheds is developing and varies across the Forests. The type of analysis used is commensurate with the scale of the potential effect a project has on the watershed cover.

For example, in the Wagon Wheel Project, a GIS analysis was done to show there are 35,958 acres in the sixth level watershed and 4,725 acres (13%) are open space or not forested in the sixth level watershed. Further analysis of aerial photos and field reviews shows that most of the forested area is greater than the 15-year age class. The proposal was approximately 780 acres of vegetation treatment, including about 166 acres of clearcut, 87 acres of shelterwood, and 57 acres of overstory removal treatments. The existing acreage in open (4,725 acres) plus the proposed treatment acres (780 acres) equals approximately 15% (5,505 acres) in open or less than the 15-year age class; therefore, the watershed is well within the guideline of having at least 34% forested and greater than 15-year age class.

Another approach is when overall project acres were minor compared to overall watershed acres, and treatments were dropping stand basal areas but leaving most of the treatment areas adequately stocked that they would not affect flow within the watersheds.

#### **Monitoring Item:** Fisheries Habitat

**Monitoring Question(s):** What are the amounts, distribution, and types of available habitats? Are minimum viable populations of appropriate native and desirable non-native species being maintained within the planning area?

**Monitoring Driver(s):** Table IV-3, Category 2, 3, & 4: Provide for the sustainability of terrestrial and aquatic ecosystems at multiple scales.

G-NR-7, Forestwide Goal: Wildlife and fisheries habitats and plant communities shall be managed to maintain viable populations of existing native and desired non-native species.

G-NR-8, Forestwide Goal: Maintain or improve the populations of endangered, threatened or sensitive species or communities.

**Management Activities:** Management of streams focused on improving habitat for resident and potomodromous coldwater species, including Management Indicator Species brook trout

and mottled sculpin, as well as the sensitive species found on the Huron-Manistee National Forests (lake sturgeon, greater redhorse, channel darter, and the snuffbox and creek heelsplitter mussels). A total of 33 miles of stream habitat were improved. Stream habitat work will include sediment basin maintenance, streambank stabilization, instream cover structure construction and repair, and large wood enhancement.

Partnerships played a vital role in the implementation of our fisheries program. Many of the stream restoration projects were part of overall watershed restoration program partnerships. Important partnership projects include:

- Bigelow Creek cover enhancement (Muskegon River Watershed Assembly)
- Little Manistee River cover enhancement (Little Manistee River Watershed Conservation Council, Conservation Resource Alliance)
- Manistee River erosion control and sturgeon rearing (Little River Band of Ottawa Indians, U.S. Fish and Wildlife Service, Environmental Protection Agency)
- Pere Marquette and Little Manistee River sediment basin maintenance (Pere Marquette Watershed Council, Little Manistee River Watershed Conservation Council)
- Sulak – A Pere Marquette River access improvement site in partnership with Michigan Department of Natural Resources

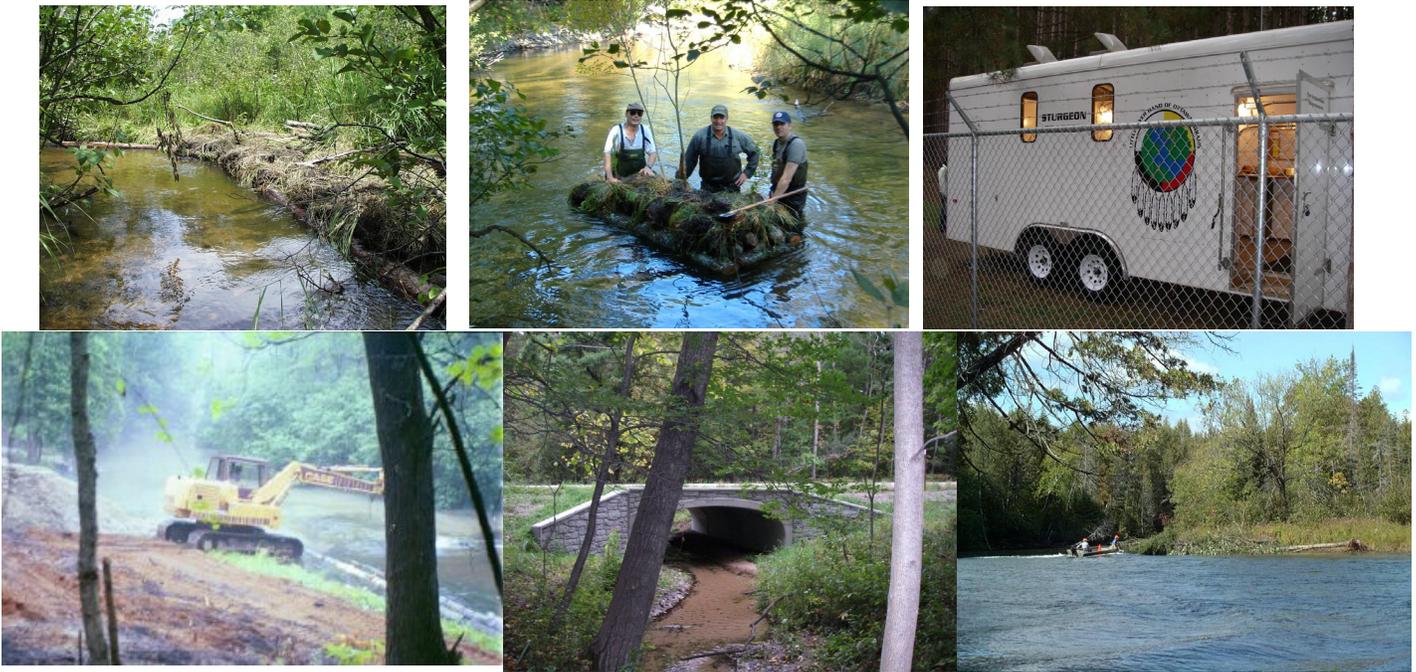


Before

After

- Pine Creek, Sickle Creek, and Cooper Creek stream crossing upgrades (Little River Band of Ottawa Indians, Conservation Resource Alliance, and Mason, Manistee, and Wexford County Road Commissions)
- Au Sable River large wood restoration (Huron Pines Resource Conservation & Development, Michigan Department of Natural Resources; 2006 Centennial of Service project)

Partner contributions to these stream and watershed improvement projects on the National Forests were approximately \$360,000.



A 350-acre lake was stocked with approximately 15,000 walleye fingerlings that were raised in a rearing pond near Mio on the Huron National Forest. Lake improvement work will include cover structures and operation of a walleye rearing pond for stocking of fish into National Forest Lakes.

**Evaluation and Conclusions:** Site-specific monitoring of representative habitat improvement is ongoing. The Little River Band of Ottawa Indians and Grand Valley State University are monitoring the Manistee River watershed improvement projects as part of their Environmental Protection Agency grant. The Michigan Department of Natural Resources is evaluating the effectiveness of the Little Manistee River sediment basin. Monitoring is also ongoing at Bigelow Creek.

**Monitoring Item: Wildlife and Vegetation Management – Minimum Viable Populations**

**Monitoring Question(s):** Are minimum viable populations of appropriate native and desirable nonnative species being maintained within the planning area?

**Monitoring Driver(s):** Table IV-3, Category 2, 3, & 4. Wildlife and Rare Plants: Maintain minimum viable populations of appropriate native and desirable nonnative species within the planning area.

G-NR-7, Forestwide Goal: Wildlife and fisheries habitats and plant communities shall be managed to maintain viable populations of existing native and desired non-native species.

G-NR-8, Forestwide Goal: Maintain or improve populations of Endangered, threatened or sensitive species or communities.

G-NR-10, Forestwide Goal: Restore and maintain savannahs, prairies, dry grasslands, mesic grasslands, shrub/scrub and oak-pine barrens in areas where they were known to previously occur, to provide for habitat diversity and to meet species viability needs.

**Background (Methods):** Surveys

**Monitoring Activities:** Forestwide Goals G-NR-7, 8, and 10 are addressed under Wildlife; Endangered, Threatened and Sensitive species; and Habitat Diversity.

In 2006, the Forests accomplished 440 acres of habitat management with partners, for wild turkey, ruffed grouse, woodcock, white-tailed deer, and various landbirds that benefited from these 16 projects. Early successional vegetation was managed (32 acres), prairies and grasslands restored (165 acres), and fire-dependent ecosystems were managed (176 acres). In addition, Forest funding supported treatment of 866 acres for terrestrial wildlife – white-tailed deer, ruffed grouse, woodcock, wild turkey, butterflies, eastern bluebird, upland sandpiper and various other landbirds. Early successional vegetation was managed (424 acres), and prairies and grasslands restored (442 acres).

The Forests restored over 56 miles of streams (18 miles anadromous, 39 miles inland coldwater) with partner support, and another mile of inland coldwater with Forest resources. In addition, partnership projects restored 364 acres of lake habitat, mostly inland warmwater.

Partner contributions were vital to Forest accomplishments for fisheries and wildlife in 2006. Partner dollars (\$73,850) and in-kind contributions (\$89,850) tripled the work the Forests were budgeted to perform, and thus vastly increased our accomplishments. Conservation partner Consumers Energy, for instance, has several projects within Forest boundaries -- on 8 cooperative projects it monitors and maintains 9 osprey nesting platforms, 197 eastern bluebird boxes, 15 American kestrel boxes, 135 wood duck boxes, and purple martin nest boxes. Consumer's Energy is also involved in managing and monitoring trumpeter swans, bald eagles, Indiana Bat and Karner Blue Butterfly, as well.

**Evaluation and Conclusions:** Given the variety of habitats, plant communities and forest conditions managed for on the Forests, management to maintain viable populations of existing native and desired non-native species is assured. Partnership projects, with Consumers Energy, Ruffed Grouse Society, Michigan DNR, National Wild Turkey Federation, Resources Conservation and Development Councils, Road Commissions, Tribes, Trout Unlimited, Universities, US Fish & Wildlife Service, Watershed Conservation Councils, etc. extend Forest resources, and make conservation projects possible, to effectively address a wide variety of species and their habitats.

<b>Monitoring Item:</b> Wildlife and Vegetation Management – Early Successional Habitat
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**Monitoring Question(s):** How many acres of early successional habitat in riparian areas occur on each Forest? Does this level of habitat provide adequate species viability?

**Monitoring Driver(s):** Table IV-3, Category 2, 3, & 4. Employ active management for early successional habitat if natural disturbance processes are not providing adequate habitat for species viability concerns.

G-NR-7, Forestwide Goal: Wildlife and fisheries habitats and plant communities shall be

managed to maintain viable populations of existing native and desired non-native species.

**Background (Methods):** Early-successional aspen/birch is found on a variety of sites across the Forests, in areas with different productivity levels. This vegetative type ranges from stands composed entirely of aspen to stands that are predominately aspen with mixtures of red maple and/or balsam fir on moister sites, with oak and/or pine on drier sites, or with northern hardwood on high productivity sites. Aspen is a short-lived species, but can live to over 100 years of age. Commercial rotation age in the Forest Plan is 50 to 60. In young stages, stand structure is usually dense shrub. Sapling stands thin naturally, providing numerous dead stems. After about age 25, aspen trees produce flower buds that are relished by ruffed grouse. Aspen provides an abundance of forage and habitat for a variety of early successional species.

**Monitoring Activities:** Forests databases indicate that approximately 45,000 acres of aspen stands are mature. During the last 10 years, the Forests have managed approximately half of the aspen early successional habitat projected in the Forest Plan. The Forests conduct limited ruffed grouse and American woodcock surveys each year. Due to this limited effort we are unable to evaluate effects of vegetation management on ruffed grouse.

**Evaluation and Conclusions:** The Forests are not meeting Forest Plan projections for aspen/ early successional habitat and commodity production. Little progress has been achieved in creating approximately 1,000 acres of aspen/early successional habitat per year, and long-term sustainability of aspen at the current Forest Plan level is in question. Providing less habitat than projected in the Forest Plan may contribute to the decline of grouse and woodcock populations, and impacts on other forest vegetation types from deer browsing, due to lack of available high quality browse. Interested groups and publics are concerned about declining aspen habitat and outputs (grouse, pulpwood, etc.) the Forests provide.

Projected (Year 2035) aspen (150,000 acres) may be met. However, if current harvest levels continue, by then over 21,000 acres would convert to another forest vegetation type, resulting in a long-term reduction of aspen to approximately 129,000 acres on the Forests.

#### **Monitoring Item: Fish – Population Trend-Regional Forester Sensitive Species (RFSS)**

**Monitoring Question:** To what extent are Forest Service management activities contributing toward population viability for native and desired non-native species?

**Monitoring Driver(s):** Forest Service Manual, 2670.

G-NR-7, Forestwide Goal: Wildlife and fisheries habitats and plant communities shall be managed to maintain viable populations of existing native and desired non-native species.

G-NR-8, Forestwide Goal: Maintain or improve the populations of endangered, threatened or sensitive species or communities.

#### **Lake Sturgeon**

**Background:** The Manistee River historically supported a large population of lake sturgeon. Because of habitat fragmentation (dams) and over-exploitation, this population has declined dramatically. This native population has historical and cultural significance to the Little River Band of Ottawa Indians (LRBOI). Monitoring for lake sturgeon was a cooperative effort lead by

the LRBOI conservation department. Other cooperators included the U.S. Fish and Wildlife Service, Michigan Department of Natural Resources, U.S. Forest Service, Great Lakes Fishery Trust, Central Michigan University, and Michigan Technological University.

**Monitoring Activities:** Monitoring for lake sturgeon included habitat assessments, monitoring the growth condition of wild versus reared sturgeon, and radio telemetry of stocked and wild fish. The Little River Band of Ottawa Indians operates a streamside rearing facility at Rainbow Bend on the Manistee River. Larval wild sturgeon are captured from the Manistee River and placed in the rearing facility. In the fall, these sturgeon are released back into the stream. In 2006, 93 lake sturgeon were released. Most of the fish had reached a length of 8 inches or greater. It is believed that this lifestage (juvenile) is one of the most critical. The streamside rearing unit allows for juveniles to attain a larger size thus enhancing their chances for survival.



Central Michigan University is currently assessing the lake sturgeon spawning population in the Manistee Lake and River, and monitoring lake sturgeon movement patterns within the lake and river (Damstra et al. 2003). Their goal is to correlate sturgeon movement patterns with habitat (abiotic and biotic) features.

**Evaluation and Conclusions:** The lake sturgeon population in the Manistee River remains low but some natural reproduction and recruitment is occurring. This is somewhat encouraging, especially when viewed from a statewide perspective. Although lake sturgeons are still widely distributed across Michigan, it is apparent that lake sturgeon abundance is far below historical levels and that some populations have been extirpated from rivers that historically supported spawning. There is little evidence of natural reproduction from most existing populations (Baker 2006). Thus, the natural reproduction and recruitment on lake sturgeon in the Manistee River is a significant part of the overall restoration program.

Defining early life characteristics, habitat preference, and monitoring relative recruitment indices will aide the Little River Band of Ottawa Indians and other managers in the continued restoration of the Manistee River sturgeon population (Chiotti et al, 2003).

### **Greater Redhorse**

**Background:** The greater redhorse sucker has been documented to occur in the Pere Marquette River. The U.S. Fish and Wildlife Service operates an electrical sea lamprey barrier with a fish ladder on this river in cooperation with the Michigan Department of Natural Resources. The fish ladder provides a unique opportunity to monitor fish passage.



**Monitoring Activities:** U.S. Forest Service personnel sampled fish passage through the ladder for eleven days from May 5 through June 6, 2006. A total of 282 redbhorse suckers were passed through the ladder with the majority being golden or shorthead redbhorse suckers. Only one greater redbhorse sucker was documented.



**Evaluation and Conclusions:** Greater redbhorse are still present in the Pere Marquette River system. Ongoing monitoring at the weir will allow for a trend analysis over time.

**FY 2007 Monitoring Efforts:** Channel darter monitoring will be undertaken in 2007 (along with the ongoing lake sturgeon and greater redbhorse sucker monitoring programs). Mussel monitoring (snuffbox, creek heelsplitter) needs to be undertaken in the future, adapting an approach developed by Dunn (2000).

**Monitoring Item:** Population Trends – American Marten & Northern Goshawk-Regional Forester Sensitive Species (RFSS)

**Monitoring Question(s):** To what extent are Forest Service Management activities directed toward population viability for native and desired non-native species?

**Monitoring Driver(s):** Forest Service Manual, 2670.

G-NR-7, Forestwide Goal: Wildlife and fisheries habitats and plant communities shall be managed to maintain viable populations of existing native and desired non-native species.

G-NR-8, Forestwide Goal: Maintain or improve the populations of Endangered, threatened or sensitive species or communities.

**Background:** Of the 135 species tracked as Regional Forester Sensitive Species (RFSS), at least 90 have Species Viability Evaluations, Conservation Assessments or Risk Evaluations completed. Additionally, Recovery or Management Plans have been prepared for all 6 Endangered or Threatened species on the Forests.

The Forests' goals for species data collection include:

- Number of Individuals
- Number flowering or in fruit
- Area of populations
- Ranked condition of populations
- Number of conservation actions or site-specific prescriptions implemented
- RFSS Population Trends –

**Monitoring Activities:** Bald Eagle, Indiana Bat, and Piping Plover are monitored as Endangered or Threatened species, reported elsewhere. Eastern Pipistrelle is monitored in conjunction with Indiana Bat. American Marten, Eastern Massasauga and Wood Turtle are subjects of cooperative graduate studies on the Forests. Sergej Postupalsky and associates search the Manistee National Forest for Northern Goshawk each spring. And Consumer's

Energy and Little River Band of Ottawa Indians track Trumpeter Swans on project reservoirs on the Manistee and Au Sable Rivers where swans were released in 1997-1999 and 2002. RFSS animals and plants are searched for in every botanical and wildlife survey of proposed projects. As a result of these dedicated studies and observations during routine field work, we reported 179 new occurrences of 20 species to Michigan Natural Features Inventory in 2006.

### **American Marten**

American marten were re-established within the Forests, in the Manistee Ranger District, in 1986. Previous marten monitoring efforts were performed in 1989-1991, and 1994-1997. Details of these monitoring efforts, in cooperation between Forest staff, Little River Band of Ottawa Indians, and Michigan DNR, are found in the 2003-2004 American Marten Winter Track Count Monitoring report (September 7, 2004). Overall, results suggest a stable population within a core area that may be expanding very slowly. Lack of tracks outside the core range into suitable habitat suggests a lack of range expansion. This population remains isolated from both Pigeon River Country releases and prior-existing populations; recent graduate studies question whether it is genetically viable, to ensure long-term survival.

### **Northern Goshawk**

Six breeding Northern Goshawk pairs (5 in Cadillac-Manistee District, 1 in Baldwin-White Cloud District), with 14 young, were located on Manistee National Forest by Sergei Postupalsky and associates in 2006. Twelve young were banded by associate Jack Holt.

Michigan's Northern Goshawk population appears to follow the 10-year cyclic fluctuations of snowshoe hare and ruffed grouse populations; the amplitude is less pronounced in the Lower Peninsula than in the Upper Peninsula and in Canada. This may be due to a more diverse prey base available in southern parts of the goshawks' breeding range. Although breeding activity remains at a low level, most of the limited number of pairs which attempt breeding, manage to raise young. The higher number of breeding pairs found and excellent productivity recorded this year may signal the onset of the expected phase of higher breeding activity.

**Evaluation and Conclusions:** The Forests' have observed no significant changes in populations, status, or area occupied by RFSS in FY 2006.

**Monitoring Item:** Habitat Improvement – Regional Forester Sensitive Species (RFSS) Standards & Guidelines

**Monitoring Question:** Are management Standards and Guidelines being implemented for RFSS or their habitats?

**Monitoring Driver(s):** G-NR-7, Forestwide Goal: Wildlife and fisheries habitats and plant communities shall be managed to maintain viable populations of existing native and desired non-native species.

G-NR-8, Forestwide Goal: Maintain or improve the populations of Endangered, threatened, or sensitive species or communities.

Forestwide and Management Area Standards and Guidelines.

**Background (Measures):** The Forests share habitat data with MDNR and USFWS. Site-specific prescriptions for RFSS are implemented, when they occur within project areas.

**Monitoring Activities:** Acres treated to benefit RFSS are recorded in the FACTS database upon accomplishment, and are reported in the Wildlife, Fish and Rare Plants report. In FY 2006, the Forests accomplished 12 acres of ETS habitat restored, and over 60,000 acres inventoried (including approximately 6,280 acres for Bald Eagle, 10,000 acres for Indiana Bat, 149 acres for Karner Blue Butterfly, 12,000 acres for Kirtland's Warbler, 170 acres for Piping Plover, and 35 acres for Pitcher's Thistle).

**Evaluation and Conclusions:** Management Standards and Guidelines, including those directed toward protecting RFSS, are routinely implemented and applied to management prescriptions in project design.

<p><b>Monitoring Item:</b> Endangered, Threatened and Sensitive (ETS) Species Conservation Strategies</p>
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**Monitoring Question(s):** To what extent are established recovery or conservation strategies for species listed under the Endangered Species Act being implemented?

**Monitoring Driver(s):** Comply with ESA.

G-NR-8, Forestwide Goal: Maintain or improve the populations of Endangered, threatened, or sensitive species or communities.

DFC-9, Forestwide Desired Future Condition: Bald eagle, Indiana bat, Karner blue butterfly, Kirtland's warbler, Piping Plover and Pitcher's thistle are managed according to their Recovery Plans.

**Background:** Site checks are conducted for compliance with Forest Plan Standards and Guidelines concerning Bald Eagle, Indiana Bat, Karner Blue Butterfly, Kirtland's Warbler, Piping Plover and Pitcher's Thistle.

### **Bald Eagle**

The Bald Eagle Management Plan, Huron-Manistee National Forests (1983) and the Northern States Bald Eagle Recovery Plan (1983) guide management and monitoring.

### **Indiana Bat**

The Indiana Bat Recovery Plan (USFWS, 1983) and an updated agency (USFWS) draft plan (1999) guide management and monitoring.

### **Karner Blue Butterfly**

The Karner Blue Butterfly Recovery Plan (USFWS, 2003) guides management and monitoring.

### **Kirtland's Warbler**

The Kirtland's Warbler Recovery Plan (USFWS, 1976, updated 1985), and the Management Plan for Kirtland's Warbler Habitat in Michigan (MI DNR and Huron-Manistee National Forest, 1981) guide management and monitoring.

### **Piping Plover**

Critical Habitat for Piping Plovers (including 4.6 miles of Lake Michigan shoreline in Nordhouse Dunes Wilderness and Lake Michigan Recreation Area (LMRA) on the Huron-Manistee National Forests) was designated in May of 2001 (USFWS 2001). The current Recovery Plan for

the Great Lakes Piping Plover, completed in September of 2003 (USFWS 2003) by the U.S. Fish and Wildlife Service, guides management and monitoring.

### **Pitcher's Thistle**

A Draft Pitcher's Thistle Recovery Plan (USFWS, 1993) guides management and monitoring.

### **Monitoring Activities:**

#### **Bald Eagle**

The Forests coordinate annual aerial surveys of bald eagle nesting pairs and nest territories with MI DNR. Following guidance in the Bald Eagle Management Plan, Huron-Manistee National Forests (1983) and the Northern States Bald Eagle Recovery Plan (1983), some 113 historically-known nest locations, and 37 potential nest locations where adult eagles have been observed, were surveyed by air and/or ground.

#### **Indiana Bat**

In even-numbered years, Dr. Allen Kurta of the Department of Biology at Eastern Michigan University and a team of graduate students erect nets inside Tippy Dam (where Indiana Bats were found in 1994, 1999 and 2000) to trap and identify bats using the area during the "swarming" period in late August. This is a cooperative effort between Consumers Energy, Eastern Michigan University and the Forest Service. In 2006, Dr. Kurta also monitored bats in 21 locations in Manistee County, as part of environmental analysis for a proposed wind-energy project, and the Forests received those encounter data.

#### **Karner Blue Butterfly**

Two Karner Blue Butterfly (KBB) Recovery Units (RUs) are identified for the Huron-Manistee National Forests: Muskegon and Newaygo. The Muskegon RU includes the Otto and White River meta-populations, and the Newaygo RU includes the Bigelow and Brohman meta-population areas. Currently, we monitor 3 subpopulation groups in Otto, 3 subpopulation groups in White River, one subpopulation group in Brohman, and 7 other subpopulations scattered within the Muskegon and Newaygo RUs. Since 1997, we have collected presence/absence data for 55 monitored sites.



Surveyed areas were either treated between 1992 and 2003 to restore oak savanna or pine barrens habitats, or represent untreated reference sites. Distance sampling surveys were conducted at least twice for each site in 2006, to obtain density estimates (# KBB/acre) for each surveyed site. We also obtain abundance estimates (# KBB/meter of transect) for sites surveyed using Pollard-Yates walks.

#### **Kirtland's Warbler**

Counting singing male Kirtland Warblers during a short period in early June is a cooperative venture of the Michigan Department of Natural Resources, US Forest Service, US Fish and Wildlife Service, Michigan Department of Military Affairs, and various other private citizens and

organizations. It is directed by the Kirtland's Warbler Recovery Team. The Recovery Plan directs cooperating agencies to "monitor breeding populations...in order to evaluate responses to management practices and environmental changes."

The Kirtland's Warbler spring census is a tool that enables managers to:

- Evaluate the warbler population relative to the recovery objective (1000 singing males for five consecutive years), to consider the need for down-listing or de-listing
- Determine the presence or absence of individuals in areas for protection purposes
- Evaluate habitat management activities (for example, plantation vs. trench and seed)
- Detect differences in occupancy, duration of use, and density of singing males between Management Areas
- Build public confidence in endangered species management
- Provide data for research

The census consists of traversing occupiable habitat early in the morning, mapping the location of singing male Kirtland's warblers, during 6 to 15 June. Census counts are conducted between local sunrise and 11:00 a.m. EDT. Surveyors traverse blocks of habitat in parallel lines, no more than 1/4 mile apart, using compass or GPS. They stop and listen for singing males every 10 chains (1/8 mile or 200 meters) for 1 to 5 minutes, and triangulate the locations of singing males by compass directions on route maps. The census is conducted with as little disturbance to the warblers as possible.

### **Piping Plover**

Historically, Piping Plovers nested in 20 Michigan counties along the Great Lakes. Since 1986, nests have been found at over 30 breeding sites in both the Upper and Lower Peninsulas (US Fish and Wildlife Service 2002).



*The goal: nesting Piping Plovers on National Forest System Land*

Monitoring efforts on Huron-Manistee National Forests began in 2001 in response to designation of Critical Habitat. Currently, a draft monitoring protocol is being reviewed, based loosely on local protocols in use on the Hiawatha National Forest. Monitoring consists of

walking an informal transect in primary (beaches up to the first dune formation ) and secondary potential nesting areas (between the first dune and the forest).

### **Pitcher's Thistle**

The Huron-Manistee National Forests' Pitcher's thistle monitoring procedure is modeled after the method used at Sleeping Bear Dunes, Indiana Dunes, and Picture Rocks National Lakeshores, developed by Kathryn McEachern (McEachern 1992).

The primary objective of monitoring is to track population trends over time. A secondary objective is to monitor changes in Pitcher's thistle habitat, and evaluate if population or habitat changes are likely due to changes in the type or amount of recreational use, or other threats (e.g., invasive species, deer and rabbit browsing, and predation by insects and birds).

Eight permanent baseline monitoring sites have been established, in three geographic zones. Each follows the tree-line behind the dunes for 300 meters, parallel to the shoreline, plus two inland "blowout" sites. Three randomly-located transects (permanent since 2001) are located and surveyed along each of 3, 100 meter segments at each monitoring site. Sample plots are contiguous 5 meter by 5 meter square plots, surveyed from tree-line toward shoreline. The following information is collected:

- Number of Pitcher's Thistle plants, by age and size class;
- Presence of all vegetative species rooted in the plot, indicating dominance;
- Estimated percent cover of bare ground;
- Evidence of disturbance, such as invasive species, trampling, browsing, or other threats.

**Evaluation and Conclusions:** Conservation Strategies and Recovery Plans are in place and followed for the 6 Endangered and Threatened species found on the Forests. Management prescriptions and actions, including road and area closures to protect Endangered or Threatened species, comply with those Strategies and Plans, and are monitored for compliance. Bald Eagle, Indiana Bat, and Kirtland's Warbler monitoring strategies seem to be working well. Karner Blue Butterfly monitoring strategy is evolving, to better track populations.

Non-Native Invasive Species (NNIS), especially Lombardy poplar and spotted knapweed have become established along the shoreline, in Pitcher's Thistle habitat. Lombardy poplar may inhibit dune processes by stabilizing them, and sprouts prolifically. Spotted knapweed has spread to previously-unaffected habitat, and competes adversely with Pitcher's Thistle. Other continuing threats will continue to be monitored, including trampling by humans, browsing by rabbits and deer, and damage by insects.

**Monitoring Item:** Endangered, Threatened, or Sensitive Wildlife Species – Population Trends

**Monitoring Question(s):** What are the population trends for Piping Plover, Piping Plover critical habitat, Pitcher's Thistle, Kirtland's Warbler, Bald Eagle, Karner Blue Butterfly, and Indiana Bat.

**Monitoring Driver(s):** Fish & Wildlife Service, Biological Opinion requirement.

G-NR-8, Forestwide Goal: Maintain or improve the populations of Endangered, threatened, or sensitive species or communities. Comply with ESA.

G-NR-9, Forestwide Goal: Manage the 5-mile (8 km) radius around Tippy Dam to benefit the Indiana bat.

DFC-11, Forestwide Desired Future Condition: Habitat needs of riparian- dependent species are met and that habitat is maintained, especially habitat for threatened, Endangered and sensitive species.

**Background:**

**Bald Eagle**

See “ETS Conservation Strategies” for protocols for cooperative surveys conducted in coordination between the Forests, MI DNR, USDI Fish & Wildlife Service, and Dr. Bill Bowerman of Clemson University. Aerial surveys of bald eagle nesting pairs and nest territories annually determine how many occupied bald eagle nesting territories exist on the Forests (and across the Northern Lower Peninsula). Nest searches concentrate on historic nests and likely riparian areas near lakes, wetlands and large rivers. Counts from previous years, using similar methods, are useful for qualitatively examining trends.

The number of bald eagle nest tree sites (active and <5 yrs since active) protected by a 330 ft. no-disturbance zone during silvicultural treatment is compiled from District Biologists’ data gathered during project Biological Evaluation preparation.

**Indiana Bat**

See “ETS Conservation Strategies” for protocols for cooperative surveys conducted in coordination between Eastern Michigan University, Consumers Energy and the Manistee National Forest.

**Karner Blue Butterfly**

The Baldwin-White Cloud Ranger District surveyed ~300 acres, ~150 acres (27 sites) using Distance sampling and ~150 acres (28 sites) using Pollard-Yates walks. In addition to Distance sampling and Pollard-Yates surveys, they conducted presence/absence surveys on ~1628 acres for the White River Environmental Assessment. Areas found to be occupied will be included in next year’s survey effort.

**Kirtland’s Warbler**

The Kirtland's Warbler census has been conducted annually since 1971, when a count showed that Kirtland’s warbler population had declined 60% from the 1961 census to only 201 singing males. The census is conducted in all areas believed to be occupiable Kirtland's warbler habitat across approximately 12,210 acres on the Huron National Forest and

1,400 acres on the Au Sable State Forest. US Forest Service, US Fish & Wildlife Service, and MI DNR employees were assisted by 24 volunteers, who provided 416 hours of time and expertise critical to accomplishing this task in 2006.

### **Piping Plover**

Piping Plovers were observed in Ludington State Park beginning in 1999, and a nest was discovered approximately 1/2 mile south of the Forest Service boundary in May 2002. Plovers nested in Ludington State Park in 2003-2006 also. In July 2002, a Piping Plover was observed on National Forest Service Lands administered by the Cadillac-Manistee Ranger Districts. Adult plovers were observed within Nordhouse Dunes Wilderness during 2003 on four occasions prior to and early in the nesting season. No known nesting sites were found. During the 2004 monitoring season, no confirmed plover sightings or known nesting sites were found on the Huron-Manistee National Forests. In 2005, six plovers were sighted on the Huron-Manistee National Forests; however no nests were found. Surveys for Piping Plovers in Nordhouse Dunes Wilderness during the 2006 season found no plovers. Piping Plover status, distribution and biology are discussed in more detail in the 2002 Piping Plover Monitoring Report (Bostick 2002) and the USFWS Biological Opinion (USFWS 2006).

### **Pitcher's Thistle**

See "ETS Conservation Strategies" for survey protocols.

**Monitoring Activities:** Frequency of Monitoring: Five years, Pitcher's Thistle (8 monitoring sites); Bi-annually, Indiana Bat; Annually, Bald Eagle, Karner Blue Butterfly, Kirtland's Warbler, Piping Plover.

### **Bald Eagle**

The 256 active nests counted in the Northern Lower Peninsula in 2006 are a marked increase from 80 pairs, over 30 years ago. Of 113 historic territories in or near the Forests, 72 were active in 2006, up from 15 in 1986. In 2006, the Huron National Forest held 38 territories, producing 60 fledglings--an average of 1.58 fledglings per territory. In the Manistee National Forest, 34 territories produced 48 fledglings--an average of 1.41 per territory, so average productivity per active territory, Forestwide, was 1.50 young per nest. In 2006, searches of 37 potential nest territories found 6 adult eagles, but no active nests.

The Northern States Bald Eagle Recovery Plan goal is to have 1,200 occupied breeding territories distributed over a minimum of 16 states within the Fish and Wildlife Service region. The Forests have met and surpassed the planned minimum goal of 1.0 fledglings produced per year from at least 20 territories.

### **Indiana Bat**

In four trap nights (2 nights, 2 net locations) inside Tippy Dam, during "swarming" season (August 28-29, 2006), Dr. Allen Kurta and students captured and identified 2387 *Myotis lucifugus* (Little brown bat), 742 *Myotis keenii* (= *M. septentrionalis*, Northern myotis), 2 *Pipistrellus subflavus* (Eastern Pipistrelle, RFSS), and 1 *Eptesicus fustus* (Big brown bat). They observed no Indiana bats (*Myotis sodalis*). Two Eastern Pipistrelles were outfitted with radio transmitters, and roost site data were collected for two weeks.

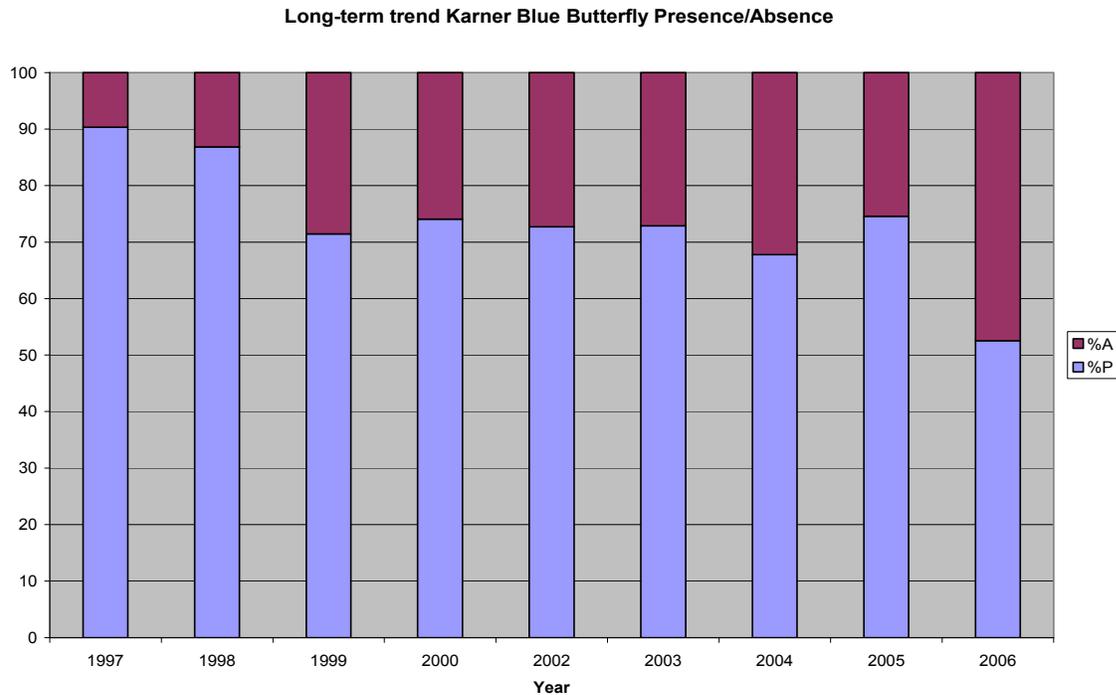


*Eastern pipistrelle with radio transmitter*

In 84 trap nights at 21 forest sites in western Mason County surveyed for a proposed wind-energy project, Dr. Kurta and students netted and identified 68 *Lasiurus borealis* (Red bats), 36 *Eptesicus fuscus* (Big brown bat), 23 *Myotis lucifugus* (Little brown bat), 1 *Lasiurus cinereus* (Hoary bat), and 1 *Lasionycteris noctivagans* (Silver-haired bat). No Indiana bats were observed in this area within the Indiana Bat Management Zone. Anabats (aural detectors) also were set for one night each at 44 sites; a couple of these sites were subsequently netted as well, because of indications of high bat activity. cursory inspection of the Anabat files provided no indications of eastern pipistrelle or Indiana bat presence.

### **Karner Blue Butterfly**

Baldwin-White Cloud Ranger District personnel and Grand Valley State University volunteers observed 497 KBB during Distance sampling surveys, and 16 KBB during Pollard-Yates surveys, where KBB were present in 11 out of the 39 stands surveyed. An average of 200 KBB were observed at the surveyed sites. KBB were found on 53% of the 55 monitored sites. Compared to data collected in 2005, 46% of the sites maintained a designation of 'KBB present'; 29% switched from a designation of 'KBB present' to 'KBB absent'; 7% switched from a designation of 'KBB absent' to 'KBB present'; and 19% maintained a designation of 'KBB absent'. Overall, 22% of the sites switched from a designation of 'KBB present' to 'KBB absent'. The graph below illustrates how the number of sites designated as 'KBB present' compares to 'KBB absent' over time: sites designated as 'KBB present' have declined since 1997.



Since 1992, handcutting, prescribed burns, mowing, scarification, and seeding have been used to manage 605 acres of occupied and 178 acres of unoccupied Karner blue butterfly habitat within the Muskegon and Newaygo RUs. In 2006, 9 acres of unoccupied Karner blue butterfly habitat were hand-cut in the Brohman MPA, and 28 acres of occupied and 47 acres of unoccupied Karner blue butterfly habitat within the Otto MPA were prescribed burned. Handcutting successfully removed encroaching woody vegetation in treated areas. However, prescribed burns conducted in March when frost was not entirely out of the ground in shaded areas did not achieve the objective of substantial vegetation removal and pocketed stand replacement. One occupied Karner blue butterfly site (seeded with warm season grass and forbs in 1992 and again in 2003) was burned unexpectedly when fire escaped in the area. Forbs in this area experienced a tremendous flush following the unexpected burn.

**Kirtland’s Warbler**

In 2006, 1479 singing males were counted in Michigan, the highest count ever recorded. This is the sixth time since 2001 that the number of singing males exceeded 1000. The 2006 count was 4 percent higher than the 1417 singing males counted in 2005.

Huron National Forest census efforts located 462 singing male Kirtland's warblers on National Forest System land (NFSL) in 2006, the highest number ever documented. This is 31% of the total singing male Kirtland's warbler population, and 10 percent higher than the Forests’ goal of producing a minimum of 420 individuals from nesting habitat on NFSL. The Forest exceeded its goal previously in 1995 as a result of the Mack Lake Burn, and every year since 2003. The past four years’ success can be attributed to the Forests’ efforts to create young jackpine plantation habitat. Kirtland’s Warbler populations in Michigan have increased in response to availability of suitable nesting habitat, protection from nest parasitism provided by cowbird trapping, and area closures to human disturbance.

From 2005 to 2006, acres of occupied habitat decreased from 9312 acres to 8887 (-5%). Two heavily occupied plantations (approximately 450 acres) in the Big Creek KMWA were destroyed by the Hughes Lake Fire that occurred on April 30, 2006.

### Piping Plover

Piping Plover Critical Habitat on Cadillac-Manistee Ranger District was monitored in 2006 by 24 surveys conducted in Nordhouse Dunes Wilderness. Additionally, 7 surveys were conducted in the area north of the Wilderness to Cooper Creek (in the Lake Michigan Recreation Area). Monitoring was conducted once or twice per week in Nordhouse Dunes Wilderness and the LMRA, between April 24<sup>th</sup> and July 19<sup>th</sup>. Observations were made using a 25-60X spotting scope or 8x40 binoculars. Surveys were reduced in early July, and ended before August in accordance with the Biological Opinion for the Piping Plover (USFWS 2006).

In 2006, 53 breeding pairs of plovers were observed in the Great Lakes area, and fledged 94 young (an average of 1.7 fledglings per nest). In addition, 17 captive-reared birds were successfully released, bringing total fledged birds for 2006 to 111 (Dingledine et al, 2006). Plovers were sighted on NFSL on 7 occasions during 2006 monitoring surveys. No plover nests were discovered on NFSL during monitoring surveys, although two preliminary nesting scrapes were observed. A nesting site was located on Ludington State Park, about 1/2 mile south of the Huron-Manistee National Forests boundary. This nest failed, and was not re-established, although the adult pair remained in the area afterward.

### Pitcher's Thistle

The following table is a summary of results of the 1993, 1996, 2001, and 2006 Pitcher's thistle monitoring for all eight monitoring sites:

Total for All Eight Monitoring Sites	1993	1996	2001	2006
Total Plants	751	1401	596	1077
Seedlings	14	188	59	132
1-4 Leaves	259	440	62	154
5-12 Leaves	323	670	325	510
13-25+ Leaves	96	80	106	229
Total Juvenile Plants (1-25+ Leaves)	678	1190	493	893
Total Juvenile Plants and Seedlings	692	1378	552	1025
Adult Plants	59	23	44	52
Average # Plants/Site/Transect	83	156	66	120
Average Bare Ground (%)	57	66	68	66
Average Distance Treeline to Beach (meters)	79	84	82	93
Average Distance Treeline to End of Veg. (meters)	87	89	93	104

## **Evaluation and Conclusions:**

### **Bald Eagle**

Bald eagle populations continue to increase in Michigan. The number of known occupied territories and nesting attempts has increased in the Northern Lower Peninsula. In addition to increases in territories, the number of fledglings per nest has also been increasing, in the Huron-Manistee National Forests as well. During the last 2 decades, the number of productive bald eagle territories established in and near the Huron-Manistee National Forests has increased significantly. Because of these region-wide successes, the US Fish & Wildlife Service proposes to de-list the bald eagle from its Threatened status in 2007. It will remain a Management Indicator Species, and RFSS, under the new Forest Plan.

### **Indiana Bat**

Biennial “fall swarming period” surveys by Dr. Kurta, in cooperation with Consumers Energy, exceed the “five-year frequency interval” suggested by US F&WS (Biological Opinion, Revised Forest Plan, 2006). In 2006, the Forest took advantage of summer surveys done for wind energy development studies, by other cooperators. The Forests continue to meet the needs of Indiana Bats through project-level conservation measures and informal consultation with the US Fish and Wildlife Service.

### **Karner Blue Butterfly**

KBB numbers were recorded at 29 sites monitored in 2005. Counts from 2006 were significantly lower than those from 2005, suggesting that KBB populations decreased between 2005 and 2006. Caution interpreting these data is prudent, since a standardized monitoring methodology did not begin until 2005.

### **Trends in Threats to the Species**

Threat A) Habitat loss/modification/destruction/succession is one of the most common threats to KBB in the monitored sites, and appears unchanged at recent levels. Past treatments have attempted to manage this threat, and several different treatments are planned to determine effectiveness at restoring and expanding KBB habitat within and around extant sites.

Threat B) Overutilization for commercial, recreational, scientific or educational purposes -- ORV/Vehicle use is one of the most common threats to KBB in the 55 monitored sites. The threat is probably declining due to additional road closures and enforcement in KBB habitat.

Threat C) Other natural or manmade factors affecting its continued existence -- factors suggested to have contributed to this year’s decline were:

- a serious frost that nipped wild lupine blooms during the third week of May, and
- nearly 2 weeks of significant rains that occurred in July during peak second flight.

None of the 4 MPAs within the Huron-Manistee National Forests currently meet Karner Blue Butterfly Recovery Plan (USFWS 2003) criteria for minimum or large viable meta-populations, and as such, we continue to work closely with the USFWS to move the areas towards maintaining these criteria. Past management efforts within the 4 MPAs have focused on maintaining/ creating subhabitats required by adult Karner blue butterflies within recently occupied sites, and increasing connectivity between such sites. We currently collect data on several habitat variables, to determine which factors influence KBB occurrence and abundance within the 4 meta-population areas. We plan to incorporate abiotic factors (e.g., temperature, snow depth, etc.) in our analyses by establishing data recorders within several survey sites.

**Kirtland's Warbler**

In the 2006 Forest Plan, approximately 88,300 acres are designated as Kirtland's Warbler Essential Habitat, 8,500 acres more than the 79,800 acres previously determined necessary to sustain the Forest's goal of 420 pairs. Essential Habitat is land identified as biologically appropriate and necessary for development of nesting habitat for Kirtland's warbler. Passing Relief Lane construction near Mio, and gas well pad and associated roads for the Merit Energy Gas Well Project near Mio (approved in 2006) are within Essential Habitat and will reduce Essential Habitat by 52 acres, to approximately 88,248 acres. Approximately 470 acres of occupiable habitat were lost as a result of the Hughes Lake Fire. However, we do not believe any Kirtland's Warblers or nests were lost, because the fire occurred prior to the birds' arrival on the breeding grounds.

In 2006, approximately 9,312 acres of habitat were occupied by Kirtland's Warbler on the Huron National Forest. It is anticipated that approximately 13,000 acres would be available to Kirtland's Warbler if the Forests harvested and planted 1,600 acres of jack pine each year as projected in the new (2006) Forest Plan (1,600 acres x 8 years of occupancy). Yet, despite the current shortfall of habitat, 462 singing males were counted on the Huron National Forest in 2006, approximately 10% higher than the minimum objective of 420 singing males.

The 2006 Forest Plan increased average annual harvest and reforestation substantially above the 1,070 acre per year target in the 1986 Forest Plan. The Forests sold 989 acres of jack pine in 2006, but this number is expected to increase to 1,269 acres in 2007 if all timber sales offered are sold. An average of 1,498 acres has been regenerated annually for Kirtland's Warbler over the past five years, including estimated habitat regenerated from wildfires. The goal is to increase harvests over several years, to meet the goal of providing a sustained 1,600 acres of habitat per year. In addition, the 2006 Forest Plan increased maximum treatment block size from 370 to 550 acres. Both changes should have substantial benefits to Kirtland's Warbler, and on the ability of the Huron-Manistee National Forests to meet or exceed the goal of providing occupiable habitat for minimum of 420 pairs.

**Piping Plover**

Primary threats to Piping Plover on the Huron-Manistee National Forests include habitat alteration and destruction, disturbance by humans and dogs (particularly during the nesting season), and increased numbers of gulls and other predators. Loss or fluctuation in amount of cobble beds along the shoreline is also a large concern, but is largely influenced by factors out of agency control, such as Lake Michigan water levels and the weather. While designated Critical Habitat along Lake Michigan beaches in Nordhouse Dunes Wilderness appears suitable for Piping Plover nesting, human use from accesses north and south may limit Piping Plover use. This human use occurs primarily during May to September, overlapping the entire Piping Plover nesting season. Heavy recreational usage, and unleashed dogs on the beach, are likely to have some impact on Piping Plover breeding activities, but the actual effects are unknown. High profile signage was installed at the Nurnberg trailhead and LMRA access points in the spring of 2003. Known predators of Piping Plover eggs and chicks (gulls and merlins) are present and common in both Nordhouse Dunes Wilderness and Ludington State Park.

Conservation or protective measures that are in place to address these concerns, include:

- Signage and psychological fencing around active nest locations, if found.
- Access restrictions prohibiting vehicle access to beaches, pedestrian access to actual nest sites, and restrictions on activities such as kite flying, fireworks, and fires within Piping Plover habitat.
- Requirements for pets to be leashed at all times in critical habitat.
- Removing shoreline garbage or litter that might attract gulls and other plover predators.
- Prohibition of resource development activities in Piping Plover habitat.
- Seasonal closures of Piping Plover habitat, as necessary.

### **Pitcher's Thistle**

Changes in population density and age structure in the sampling area may be due to: extreme variations in the population from year-to-year;

- or recruitment variability from juvenile to adult;
- or variable reproductive success of adult plants;
- or large-scale factors such as weather.

Pitcher's Thistle grows in a non-random, highly-clumped pattern, and seedling and adult establishment varies from year-to-year. The random-sampling method employed from 1993 to 2001 may by itself explain fluctuations in population, age structure and habitat affinities observed. Random transect locations established in 2001 were made permanent, to establish a consistent comparison between transects. Pitcher's Thistle monitoring project is scheduled to continue, at least every 5 years, to monitor population trends, habitat changes, and effects of potential threats to the species and populations here.

**Monitoring Item:** Restoration of Savannahs, Prairies, Dry Grasslands, Mesic Grasslands, Shrub/Scrub, Oak-Pine Barrens in LTAs 1 & 2, Old Growth Areas, Use of Prescribed Fire

**Monitoring Question(s):** Have prescribed fires or other management activities for the purpose of maintaining or creating Savannahs, Prairies, Dry Grasslands, Mesic Grasslands, Shrub/Scrub, Oak-Pine Barrens moved these areas toward the DFC? How many acres within fire-adapted LTAs were treated with prescribed fire? Have prairies, savannahs, and oak-pine barrens been restored and maintained on approximately 10,000 acres within old-growth areas?

**Monitoring Driver(s):** G-H&S-6, Forestwide Goal: Fire use is suitable on National Forest System lands. Fire use will, to the extent possible, mimic natural processes to accomplish resource objectives, while protecting wilderness values and cultural, historical and developed resources.

G-NR-8, Forestwide Goal: Maintain or improve the populations of endangered, threatened or sensitive species or communities.

G-NR-10, Forestwide Goal: Restore and maintain savannahs, prairies, dry grasslands, mesic grasslands, shrub/scrub and oak-pine barrens in areas where they were known to previously occur, to provide for habitat diversity and to meet species viability needs.

G-NR-11, Forestwide Goal: Utilize prescribed fire to meet management direction as appropriate for the ecosystems involved.

DFC-7, Desired Future Condition: Prairies, savannahs, and oak-pine barrens have been restored and maintained on approximately 10,000 acres within old-growth areas.

**Monitoring Activities:** Treatments are recorded in the FACTS database upon accomplishment. A total of 1,782 acres of Savannahs, Prairies, Dry Grasslands, Mesic Grasslands, Shrub/Scrub, or Oak-Pine Barrens were burned or had vegetation management activities that promoted more natural conditions or disturbance regimes. Prescribed treatments employed habitat restoration tools such as timber harvest, prescribed burning, or hand release. The purpose of prescribed burns was largely Fuels and Restoration, Fire Regimes 1 & 2.

**Evaluation and Conclusions:** At the current rate of harvest, prescribed fire, and opening maintenance, it may take 5 or more years to approach the Desired Future Condition of 10,000 acres in these habitat types.

**Monitoring Item:** Wildlife Forage – Transmission Line

**Monitoring Question(s):** Are Transmission lines being treated to benefit wildlife?

**Monitoring Driver(s):** G-NR-18, Forestwide Goal: In cooperation with permittees, favor selective treatment of vegetation in transmission line rights-of-way to improve wildlife forage.

**Background (Methods):** Transmission lines owned by Consumer's Energy cross Forest Service lands within easements managed by Consumer's Energy. Managing powerline vegetation for low-growing grass and herbaceous vegetation benefits their operation, by

removing woody vegetation that might impact lines or maintenance. It also creates potential habitat for Karner Blue Butterflies, if lupine or nectaring flowers are present.

**Monitoring Activities:** Consumer's Energy monitors and reports (to Federal Energy Regulatory Commission, US Fish & Wildlife Service and to the Forest Service) on transmission line treatments intended to improve Karner Blue Butterfly habitat each year. In 2006, Consumer's Energy managed 14 acres at 2 transmission line locations within the Forest boundary (but on State Land: Croton Boat Launch and Newaygo State Park) by manual cutting, herbiciding, hand-pulling knapweed and hand-planting lupine, primarily to benefit Karner Blue Butterfly.



*Consumer Energy treatment plot near Newaygo in FY 2006 (6/30/06).*

**Evaluation and Conclusions:** This partnership effort has the potential to provide corridors between occupied habitats, enhancing dispersal, colonization and survival of Karner Blue Butterflies, especially in meta-population areas identified on the Manistee National Forest, Baldwin-White Cloud Ranger District.

<b>Monitoring Item: Fish and Wildlife Population Objectives – General</b>
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**Monitoring Question(s):** Is management of National Forest habitats consistent with meeting Michigan DNR wildlife and fish population objectives? Are the tribes consulted regarding wildlife and fisheries objectives?

**Monitoring Driver(s):** G-NR-12, Forestwide Goal: Encourage cooperation and coordination with responsible government land and resource management agencies, tribes and partners in program management such as recreation; Wild and Scenic Rivers and State Natural Rivers; minerals; air quality; law enforcement; fire; water quality; Endangered, threatened, and sensitive species; non-native invasive species; and insect and disease.

G-NR-13, Forestwide Goal: Cooperate with individuals, organizations and local, state, Tribal and federal governments to promote ecosystem health and sustainability across landscapes.

**Background:** Participate in bear, deer, ruffed grouse, turkey, and fisheries planning meetings, and coordinate Forest programs with Michigan DNR and Tribes.

**Monitoring Activities:** The Forests meet regularly with Michigan DNR, to discuss population management objectives for white-tailed deer, black bear, game fish, otter, marten, etc. The Forests cooperate with Tribes (Little River Band of Ottawa Indians and Grand Traverse Band of Ottawa and Chippewa Indians) on marten and white-tailed deer studies, native sturgeon restoration, and non-native invasive species control.

**Evaluation and Conclusions:** The Forests will continue to collaborate and cooperate with Tribes, and Federal and State agencies to achieve shared wildlife and fish population objectives.

<b>Monitoring Item: Fire Management – Safety</b>
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**Monitoring Question:** What activities have been done to promote safe fire prevention and fire suppression?

**Monitoring Driver(s):** G-H&S-3, Forestwide Goal: Fire suppression activities should be the least impacting to the environment while providing for safety, but still achieve the objectives of fire suppression.

G-H&S-8: Provide for the protection of NFS lands and for the property and safety of users.

**Background:** Large catastrophic wildfires occur on a regular basis on the Huron-Manistee National Forests. On average, a 5,000 acre fire burns in the conifer fuel types every five years. The Forests have part of the largest contiguous areas of jack pine in the United States. This fuel type, on rapidly drying sandy soils, generates very high fire danger in April and May, and a lesser extent through the summer.

Smaller fires are fairly common on the Forests and these require an organized and immediate response to minimize their severity. Safety of employees and public is the first objective of every wildfire response.

The Forests have an active fire prevention program. Local media, including television and radio, are provided with up to date fire danger information. Wildfire prevention programs, such as *Firesafe*, are provided to the public at special events to promote practices and activities that reduce fire risk around homes or cabins.

**Monitoring Activities:** Line officer review of fires was accomplished with the on-site review of more than 10 percent of fires on the Forests. The 5,980 acre Hughes Lake Fire on the Mio District was reviewed by the District Ranger and Deputy Forest Fire Management Officer. The Forest Service also participated in a local review by Fire Departments and the County Dispatch Center. The Huron-Manistee National Forests had 95 fires in 2006 that received a Forest Service response.

Prescribed fire burn planning is thorough, with multiple level reviews. National, Regional and Forests direction in the burn plans are completed for all management ignited burning. Detailed briefings prior to implementation and After Action Reviews are completed on all burns to acknowledge success and assess possible actions to improve burn management.

**Evaluation and Conclusions:** The Forests are very strong in promoting safe practices in fire suppression, fuels management, and fire prevention. From the Forests' leadership all the way through firefighters on the ground the main emphasis is fire safety in all activities on and off Forest.

Wildland fire suppression and prescribed burning did not result in any reportable accidents or injuries to personnel involved. Pre-work briefings, reviewing the specific Job Hazard Analysis and personal attention to performing activities safely have contributed to a safe work environment.

#### **Monitoring Item: Fire Hazard Rating Class**

**Monitoring Question:** What is the distribution of National Forest System acres by fire hazard rating? How many acres in fire-dependent ecosystems and at-risk urban-rural interface and intermix areas have been reduced by at least one hazard rating class?

**Monitoring Driver(s):** Table IV-3, Category 2, 3, & 4. Wildland Fire and Fuel Management: Manage hazardous fuels in fire dependent ecosystems and at-risk urban-rural interface and intermix areas.

G-H&S-7, Forestwide Goal: Implement fuels reduction and fuelbreak projects where conditions warrant for the protection of life, property and safety. High-risk areas adjacent to private land will receive treatment priority.

**Background:** The priority for fuel reduction activities are high fire risk areas around improvements of value. Most often these areas are public residences or seasonal dwellings on private property. Because of the preponderance of private land in-holdings across the Forests there are many private land improvements that have a high risk of damage or destruction from a wildland fire.

**Monitoring Activities:** Hazard rating reduction takes place through vegetation management fuels treatments. In FY 2006, the Forests accomplished 8,689 acres of activities that lowered fire hazard rating. Monitoring through contract administration, and line officer involvement,

ensure objectives are being met. Prescribed burning, timber sales, and other vegetation management have combined to reduce wildfire hazard on the Forests to provide a lesser risk to Forests' employees and public.

**Evaluation and Conclusion:** The Forests are not measuring hazard ratings per se, though fuel hazard reduction activities are making a difference. During the Hughes Lake Fire, the fire burned up against areas that the Forests' had treated in recent years. The extreme fire behavior was changed to lower fire intensity that allowed the Forests and cooperator fire suppression resources to safely work on the fire's edge. Success stories were done in these instances and were shared on the nationwide website. (<http://ssrs.r9.fs.fed.us/>).

#### **Monitoring Item:** Fire Condition Class

**Monitoring Question(s):** What is the distribution of National Forest System acres by fire condition class? How many acres have been treated that result in an improvement of at least one fire condition class? What are the number and size of wildfires?

**Monitoring Driver(s):** Table IV-3, Category 2, 3, & 4. Wildland Fire and Fuel Management: Reduce wildland fire intensities and the number of catastrophic fires.

G-H&S-1, Forestwide Goal: Suppress wildfires using an appropriate management response, in a manner compatible with Management Area objectives. Prevention, pre-suppression and suppression activities will be based on analysis of past fire occurrence, fire intensities and values at risk.

G-H&S-2, Forestwide Goal: Encourage adequate fire prevention, fire-safe construction, and presuppression activities on private lands in wildland/urban interface fire-prone areas.

G-H&S-3, Forestwide Goal: Fire suppression activities should be the least impacting to the environment while providing for safety, but still achieve the objectives of fire suppression.

**Background:** Condition class change is being recorded in FACTS as projects are completed. Forest fuels planners are determining class change by percentage based on condition change from the fuel reduction and vegetation management activities.

Wildfires are being suppressed with the appropriate suppression response. Minimum impact suppression tactics are used where conditions allow.

**Monitoring Activities:** In 2006, the Forests had 95 fires on 7,000 acres. The Hughes Lake Fire of April 30, 2006, burned 5,980 acres. Fuel reduction activities on lands adjacent to this fire helped in the suppression of this fire.

Hazardous fuel reduction was accomplished on 4,546 acres. This resulted in directly improving condition class on these acres. These areas were broadcast burned, had mechanical fuel reduction activity, or had vegetation management that lessened the wildfire risk. Project areas were monitored after activity completion to confirm the reduction in fuel loading. In addition, another 4,143 acres were treated by vegetation management practices such as conifer harvest for Kirtland warbler habitat, wildlife opening maintenance, and timber harvesting that helped reduce hazardous fuels and change fire condition class.

**Evaluation and Conclusion:** Condition class change was accomplished on these project areas that moved them toward a fire regime that is within a historical range defined in terms of departure from the historic fire return interval. This means vegetation attributes (species composition and structure) are intact and functioning within a historic range.

**Monitoring Item:** Non-Native Invasive Species – Strategy

**Monitoring Question(s):** To what extent is forest management contributing or responding to populations of terrestrial/aquatic non-native invasive species (NNIS) of concern? How has the national NNIS strategy been implemented on the Forests?

**Monitoring Driver(s):** Executive Order #13112. R-9 Non-Native Invasive Species Strategy. Non-native invasive species are one of the FS Chief's top four threats to National Forest System lands.

G-NR-6, Forestwide Goal: Reduce non-native invasive species infestations and prevent new invasive species from becoming established, when possible.

**Background:** Progress has been made in the development and implementation of a Forestwide strategy to control the spread of non-native invasive species.

Non-native invasive species are those plant and animal species which are not indigenous to the northern Lower Peninsula of Michigan, and which aggressively compete for space and resources with native species. An organism is considered non-native when it has been introduced by humans to a location outside its natural or native range. The most important aspect of a non-native species is how it responds to a new environment; those species that are both non-native and aggressive can alter natural ecosystems.

In 2004, the Forests updated and finalized a non-native invasive plant list for the Forests. The list includes plant species not yet found on the Forests but likely to arrive in the near future. Sixty plants are listed as non-native invasive species of concern for the Forests. Each species has an associated management goal ranging from immediate eradication to preventing invasion in non-infested areas. The list is a working document that will change to incorporate additional species not yet identified as non-native invasive species. Management goals are also likely to change based on new information. The current list of non-native invasive species of concern can be found on the Huron-Manistee National Forests' website.

In 2006, the Forests began preparing a "Non-Native Invasive Species Framework", tiered to objectives in the "NNIS Framework for the Eastern Region". The Forests initiated a NNIS Plant Control program, using Forests-wide Integrated Pest Management treatments to control priority infestations. In order to facilitate prevention, early detection, and rapid response, the Forests developed a PowerPoint presentation of the 15 NNIS of major concern, to educate all field-going staff on problems to watch for. A Field Guide to these 15 NNIS of major concern is also being developed. It is anticipated that this list and presentation will be expanded to include animal NNIS (vertebrates, insects, etc.) in 2007.

**Monitoring Activities:** New locations of invasive plant infestations are recorded at the project level during botanical surveys of project areas.

**Evaluation and Conclusions:** The national NNIS Strategy is being implemented across the Forests, in monitoring surveys, treatment prescriptions, Standards & Guidelines administration, and education.

<b>Monitoring Item: Non-Native Invasive Species – Treatment</b>
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**Monitoring Question:** What percent of NNIS sites and acres have been treated, and how effective was the treatment?

**Monitoring Driver(s):** Executive Order #13112. R-9 Non-Native Invasive Species Strategy. Non-native invasive species are one of the FS Chief's top four threats to NFS lands.

G-NR-6, Forestwide Goal: Reduce non-native invasive species infestations and prevent new invasive species from becoming established, when possible.

**Background:** Non-native invasive plant control was achieved on 178 acres in 2006. Species pulled, covered, mowed, herbicided or otherwise removed include spotted knapweed, leafy spurge, garlic mustard, autumn olive, honeysuckle, Lombardy poplar, hoary alyssum, St. Johnswort, smooth brome, periwinkle, white sweetclover, purple loosestrife, phalaris and phragmites. Herbicide was used on small populations in administrative or recreation sites.

**Monitoring Activities:**

Inventories occur as NNIS Plant Control treatments are accomplished, and elsewhere as resources allow. Under a grant from US F&WS, the Forest significantly increased mapping of NNIS, especially spotted knapweed, in Pitcher's Thistle habitat in Nordhouse Dunes and Lake Michigan Recreation Area, in Manistee and Mason Counties. The Forest also developed an Implementation Plan to address NNIS in Wilderness, and began implementing the national NRIS NNIS Database, including field mapping of infestations.

**Evaluation and Conclusions:** Noxious weed populations continue to increase and compete with desirable native species. Present control methods are ineffective in reducing the population and spread of noxious weeds throughout the Forests. Herbicides are not presently used to reduce noxious weed populations except in 30 administrative or recreation sites. Control efforts are likely to remain ineffective until a State-wide, multi-jurisdictional control program is developed and funded.

Purple loosestrife control continues to show positive results from the release of *Galerucella* beetles.

The photographs below show a cooperative work project in the Nordhouse Dunes Wilderness where Forest Service employees removed garbage bags of spotted knapweed from about 34 acres of sand dune habitat. District Botanist, Carolyn Henne said, "I was very happy to see that the area was far less infested with spotted knapweed than it was last year, so it seems that our pulling efforts last year really had a positive impact on decreasing the amount of spotted knapweed in the Wilderness Area." Last year, groups went out a couple times to pull spotted knapweed and this year another group will pull weeds at another location later. Spotted knapweed is growing in the same area as Pitcher's thistle (*Cirsium pitcheri*), a federally threatened species, so it is very important to remove the spotted knapweed to keep it from having a negative impact on the Pitcher's thistle.





Spotted knapweed is commonly found in areas that are most heavily used for camping and hiking. The most important action people can do to minimize the spread of noxious weeds is to thoroughly clean out their camping and hiking equipment before entering natural areas, such as the Nordhouse Dunes Wilderness Area. The Forest Service plans to install boot scrapers/brushes at the trailhead so people can clean out their boot treads before entering the Wilderness Area.

**Monitoring Item:** Effects of Off-Road Vehicles – Non-Native Invasive Species (NNIS)

**Monitoring Questions(s):** What are the effects of off-road vehicle use on the spread of Non-Native Invasive Species (NNIS)?

**Monitoring Driver(s):** 36 CFR 219.21g. Reduce non-native invasive species infestations and prevent new invasive species from becoming established, when possible.

G-NR-6, Forestwide Goal: Reduce non-native invasive species infestations and prevent new invasive species from becoming established, when possible.

**Background:** Quantitative estimate of the rate of spread of NNIS adjacent to Off-Road Vehicle

trails would require staffing to survey at least parts of the 1,350 miles of trails and 3,730 miles of roads on the Forests. Approximately 290 miles of designated trails are open to all-terrain/off-road vehicle use, 280 miles to mountain bike use, 250 miles to motorcycle use, 150 miles to horse use, and 450 miles to hiking/walking – each with different risks from NNIS. Rate of spread could be quantified as the change in percentage of trails infested from year to year, or the change in miles of trail that are infested from year to year. Confidence in these measures, and their usefulness for management, depend, in part, on the sampling effort.

**Monitoring Activities:** Forest personnel have directed their energies and time toward completing the NNIS Plan, educating Forest staff on priority NNIS threats so they can be reported, and controlling populations of NNIS that pose the greatest threat to sensitive plant populations and habitats. Monitoring effects of off-road vehicle use has been incidental to other field activities. Inventories occur as resources allow.

**Evaluation and Conclusions:** Monitoring, management, and treatment of NNIS will continue proportional to available resources. To date, efforts made have shown success and completion of Forestwide analysis is predicted to help move the Forests forward with a variety of options to treat infested areas.

#### **Monitoring Item:** Non-Native Invasive Species – Aquatic

**Monitoring Question:** To what extent is forest management contributing or responding to populations of terrestrial/aquatic non-native invasive species of concern?

**Monitoring Driver:** Executive Order #13112. R-9 Non-Native Invasive Species Strategy.

**Management Activities:** A non-native aquatic plant survey was done at Loda Lake, a 16-acre lake within the Loda Lake Wildflower Sanctuary. A meandering route around the lake was taken and submergent and emergent aquatic vegetation was identified.

**Evaluation and Conclusions:** No non-natives were found. Additional NNIS aquatic species monitoring will be undertaken in 2007 (initial presence/absence surveys; Madsen 1999). Initial focus will be on the Au Sable River impoundments. If present, quantitative follow-up surveys will be conducted in subsequent years.

#### **Monitoring Item:** Effects of OHVs – Stream Quality/Wetlands/Riparian Areas/Soils

**Monitoring Question(s):** What are the effects of off-road and off-trail vehicle use on streams, riparian areas, wetlands, soils, vegetation and other resources? Is unacceptable resource damage occurring and are off-road, off-trail impacts declining?

**Monitoring Driver:** G-NR-14, Forestwide Goal: Manage riparian areas consistent with resource conditions, management objectives and designated water use. Reduce nonpoint pollution to the maximum extent feasible and protect the hydrologic functions of watersheds, including both surface and groundwater systems.

G-NR-31, Forestwide Goal: Manage Off-Highway Vehicles, including snowmobiles, by designating trails or routes to minimize user conflicts and to provide for user satisfaction, resource protection and public health and safety.

**Monitoring Activities:** A qualitative assessment of the amount and proliferation of user created roads was conducted.

**Evaluation and Conclusions:** User created roads and trails continue to be problematic for the Huron-Manistee National Forests. Qualitatively, it appears that user created roads and trails are increasing, or at best remaining the same. As roads and trails are closed and rehabilitated additional user created roads and trails are either created elsewhere or reopened. In 2006 special emphasis was placed on closing roads, including user created roads, in the White River Area, Poplar Creek, and users created access sites along the Au Sable River. Approximately 20 miles of user created roads were closed and/or rehabilitated. The amount of new user created roads and trails in 2006 are unknown.

Unmanaged uses of OHVs continue to negatively impact the watersheds by destroying habitat, compacting soils, causing erosion and sediment in the watersheds of the Huron-Manistee National Forests. Efforts are continuing to mitigate these impacts resulting from illegal activities occurring on the Forests.



*An example of a breached road closure.*



*An example of an intact road closure.*

**Monitoring Item:** Evaluate the Effects of Motorized Vehicle Use Off Roads and on Trails, Routes, Roads, and Areas Used by Motorized Vehicles

**Monitoring Question(s):** What are the demand, supply, and trends of visitors using motorized vehicles, both off-road and street-legal? How many miles of trails, routes, roads, and acres of area have been designated open? How many miles have been constructed? How many miles have been closed? Are trails and roads being maintained to safe standards?

**Monitoring Driver(s):** G-NR-30, Forestwide Goal: Design and manage trails for a primary seasonal use, to discourage conflicting uses. Prevent motorized and nonmotorized uses from occurring at the same time during any season of the year. Trails may also have secondary uses.

G-NR-31, Forestwide Goal: Manage Off-Highway Vehicles, including snowmobiles, by designating trails or routes to minimize user conflicts and to provide for user satisfaction, resource protection and public health and safety.

**Background:** A nation-wide Travel Management Rule was completed in November 9, 2005. According to the rule on all National Forest System lands, motor vehicles can only be used on roads, trails, and areas that are designated open. This includes all motorized wheeled vehicles from ORVs to street legal cars.

Motorized Vehicle Use Maps will be produced on each national forest showing roads, trails, and areas, which are open to motorized travel. Travel maps will be updated each year on the same date to capture any management or resource changes. Changes to roads, trails, and areas are made using the National Environmental Policy Act process, which includes public involvement. Motorized Travel Maps will be free to the public and available for down load from Forest websites.

The Rule becomes effective when a national forest publishes their first Motor Vehicle Use Map. The Huron-Manistee will be publishing a map for each of the four districts. The two Ranger Districts on the Huron National Forest will publish their maps in March 2008. The two Ranger Districts on the Manistee National Forest will publish their maps in March 2009.

The Travel Management Rule changed the numbering of 36 CFR as follows:

*1. Background - Travel Management Program* “Forest Service regulations at 36 CFR part 212 governing administration of the forest transportation system and regulations at 36 CFR part 295 governing use of motor vehicles off National Forest System (NFS) roads are combined and clarified in this final rule as part 212, Travel Management, covering the use of motor vehicles on NFS lands. These regulations implement Executive Order (E.O.) 11644 (February 8, 1972) “Use of Off-Road Vehicles on the Public Lands, “as amended by E.O. 11989 (May 24, 1977). These Executive orders direct Federal agencies to ensure that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands.”

As adopted in the ROD page 27, The Travel Management Rule (70 Federal Register 68264), dated November 9, 2005 (36 CFR Parts 212, 251, 261, and 295) revised regulations regarding

travel management on National Forest System lands to clarify policy related to motor vehicle use including off-highway vehicles. This rule prohibits the use of motor vehicles off the designated system or use inconsistent with those designations once designations are published on a Motor Vehicle Use Map.

**Evaluation and Conclusions:** The majority of the Huron-Manistee National Forests’ transportation system is currently in place and supports a system of Forest roads and trails that are open to OHV use, (354d, book 1 page 249, Forest Closure Order No. 5300/04/02/05 signed 6/13/2002). The 2006 Forest Plan sets desired conditions, goals and objectives that maintain a “closed unless designated open” policy for OHV travel, allows for a moderate level of increased OHV route development primarily focused on creating loops and connections between existing roads, trails and facilities, and to continue the current prohibition on cross-country OHV travel.

<b>Ranger District</b>	<b>National Forest System (NFS) Acres</b>	<b>Projected Date For Publication of - Motor Vehicle Use Map Published</b>	<b>Existing NFS Roads Open To Motor Vehicle Use</b>	<b>Existing NFS Trails Open To Motor Vehicle Use less than 50 inches</b>	<b>Existing NFS Trails Open To Motorcycle only</b>	<b>Existing NFS Trial and Routes open to Snowmobile from Nov 15 to March 15</b>	<b>Acres in Areas Designated open for motor vehicle (Bull Gap Hill Climb)</b>
Baldwin-White Cloud	300,680	Mar-09	1102	70	124	--	0
Cadillac-Manistee	239,127	Mar-09	752	5	99	--	0
Mio	211,276	Mar-08	804	172	28	--	19
Huron Shores	226,984	Mar-08	583	46	0	--	0
Total			3241	293	251	599	19

<b>Table 17. Motorized Recreational Opportunities on Huron-Manistee National Forests</b>	
<b>ACTIVITY</b>	<b>AVAILABLE</b>
OHV less than 50 inches wide	293 miles designated trail and 19 acres of Bull Gap Hill Climb Area (must have state ORV sticker) prohibited anywhere off designated trail or route (Forest Closure Order No. 5300/04/02/05 signed 6/13/2002 and 2005 Travel Management Rule)
Snowmobile	599 miles designated trail or route (must have state snowmobile sticker) prohibited anywhere off designated trail or route (Forest Closure Order No. 5300/04/02/05 signed 6/13/2002 and 2005 Travel Management Rule)
Driving for pleasure	3,241 miles of National Forest System roads (must be street legal and have state license) prohibited anywhere off designated trail or route or roads (Forest Closure Order No. 5300/04/02/05 signed 6/13/2002 and 2005 Travel Management Rule)
Motorcycle	251 miles designated single-track trail, if street legal 3,241 miles of National Forest System roads (must have state sticker and/or street license) prohibited anywhere off designated trail or route or roads (Forest Closure Order No. 5300/04/02/05 signed 6/13/2002 and 2005 Travel Management Rule))

**Monitoring Item:** Monitor Trails, Routes, Roads, and Areas Being Used by Nonmotorized Activity and Equipment.

**Monitoring Question(s):** What are the demand, supply, and trends of visitors using nonmotorized trails? How many miles of trails, routes, and acres of area have been designated open? How many miles of trail have been constructed? How many miles of trails been closed? Are trails being maintained to safe standards?

**Monitoring Driver:** G-NR-30, Forestwide Goal: Design and manage trails for a primary seasonal use, to discourage conflicting uses. Prevent motorized and nonmotorized uses from occurring at the same time during any season of the year. Trails may also have secondary uses.

**Monitoring Activities:**

<b>Table 18. Nonmotorized Recreational Opportunities on the Huron-Manistee National Forests</b>	
<b>ACTIVITY</b>	<b>AVAILABLE</b>
Horse	149 miles designated trail, allowed cross-country on approximately 967,320 acres. Prohibited on some foot travel trails, NCT, 3,450 ac of Nordhouse Dunes Wilderness, developed recreation areas, and seasonally in threatened or endangered species habitat during nesting
Mountain Bike /Bicycle	280 miles designated trail, allowed cross-country on approximately 969,550 acres. Allowed to use 3,241 miles of road shoulder prohibited on 45 miles of NCT & 3,450 ac of Nordhouse Dunes Wilderness and seasonally in threatened or endangered species habitat during nesting
Cross-country ski	168 miles designated trail encouraging cross-county skiing, 973,000 acres open to cross-county ski travel. Allowed to use 3, 3,241 miles of road shoulder and approximately 1350 miles trail designated for other uses no matter what the designations but discourage on motorized trails for safety
Hiking, walking, Snowshoeing	450 miles designated foot travel trail encouraging foot travel, and 973,000 acres open to all foot travel. Allowed to use 3,730 miles of road shoulder and approximately 1350 miles trail designated for other uses no matter what the designations but discourage on motorized trails for safety. Prohibited seasonally in threatened or endangered species habitat during nesting

**Monitoring Item:** Wild & Scenic Rivers System, Wilderness, National Scenic Byway, National Wildflower Sanctuary, North Country National Scenic Trail

**Monitoring Question:** Is the integrity of recreational areas of special or unique concern being protected?

**Monitoring Driver(s):** G-NR-33, Forestwide Goal: Manage National Recreation Trails, Byways, Rivers, and Wildernesses in accordance with the commitments associated with their designation.

DFC-3, Forestwide Desired Future Condition: The North County National Scenic Trail is constructed and administered as a premier hiking and backpacking trail. The trail will highlight significant scenic, historic, natural and cultural qualities.

DFC-4, Forestwide Desired Future Condition: Designated National Wild, Scenic, and Recreation Rivers are managed according to the management plan for the individual river.

DFC-6, Forestwide Desired Future Condition: Areas with unique character are protected.

**Monitoring Activities:** The Huron-Manistee National Forests are in the process of updating the 1983 Pere Marquette National Scenic River Management Plan, amended in 1990. The river is located on the Baldwin Ranger District. The update will continue to maintain the free-flowing, high water quality, and outstandingly remark values for which the river was designated under the Wild and Scenic Rivers Act. The Pere Marquette National Scenic River outstanding remarkable values include heritage resources, scenery, recreation, and fisheries. During the

update, the river team is addressing issues, which have been identified or changed since 1990. After receiving public comments, the river team identified issues needing to be updated since the 1983 Pere Marquette Comprehensive River Management Plan, as amended in 1990. The issues identified within the river corridor were access, facilities, visitor use, visitor capacity, shoreline development, aquatic habitat, fisheries, unified management, law enforcement, information, and education.

**Monitoring Item:** Developed Recreation Opportunities

**Monitoring Question(s):** Are developed recreational services and facilities being provided on the Forests? How many have new sites have been planned and constructed, and for what reason? How many site have been decommissioned or services reduced, and for what reason?

**Monitoring Driver(s):** G-NR-29, Forestwide Goal: Provide a variety of access opportunities for a range of user abilities consistent with management area direction and Standards and Guidelines.

**Background:**

<b>Table 19. Developed Recreational Opportunities on Huron-Manistee National Forests</b>	
<b>ACTIVITY</b>	<b>AVAILABLE</b>
Developed Recreation (Camping, Swimming, Picnicking, Interpretation, and access sites for trails, rivers, & lakes)	176 sites, approximately 2,230 acres, most sites opened seasonally but some are year round. (Most sites require a national recreation permit). Prohibited seasonally in threatened or endangered species habitat during nesting.

- Interpretive Kirtland's warbler tours
- Visitor protection through law enforcement patrols.
- Interpretive and Informational Brochures, Displays, and Programs
- Repair or replacement of accessible toilets and animal proof trash containers
- Improve travel-ways for accessibility
- Hazard tree removal, Snowplowing, Mowing, Garbage Collection, Signing, Cleaning
- Install drinking water well at Big M.
- Replace boat slide at Green Cottage
- Administer Recreation Event Special Uses Permits

**Monitoring Activities:** Huron-Manistee National Forests' personnel and their partners in 2006 accomplished the following maintenance programs. Sites and programs maintained and operated through the Federal Lands Recreation Enhancement Fees program:

Maintained and operated –

Day Use and/or Access Sites

23 sites along five National Scenic Rivers

- 2 sites near Nordhouse Dunes

Wilderness

- 6 sites near Semi Primitive areas
- 5 sites along North Country National Scenic Trail

•18 other campgrounds and/or day use sites

Provided to visitors for their enjoyment and protection:

- Camping or watercraft permit systems along 3 National Scenic Rivers
- Interpretive Kirtland's warbler tours



**Drinking water well installed at Big M site**

Sites and programs maintained and operated through the Special Use Permit authorization:

- 83 recreation residences
- 77 Outfitters and Guides
- 40 Recreation Events
- 27 Campgrounds
- 3 Day Uses and Access Areas
- 19 other recreation permits

**Replacement of the boat slide at Green Cottage on the Pere Marquette National Scenic River**

**Before**



**After**



Sites and programs maintained and operated through coordination with partners, and other funds and authorities

- 16 campgrounds
- 14 day use and interpretive sites including Lumberman's Monument Visitor & Interpretive Center
- 21 Boating and Fishing Access sites
- 39 Trailheads

**Monitoring Item:** Recreation – Maintenance

**Monitoring Question(s):** Are swimming beaches safe?

**Monitoring Driver(s):** FEIS-8, Chapter III, Final Environmental Impact Statement: Determine bacteriological safety of water for full body contact recreation, for example, swimming.

**Monitoring Activities:** The Huron-Manistee National Forests monitored for E. coli at 15 swim beach sites across the Forests. Each beach is sampled every two weeks, between Memorial Day and Labor Day, with three sampling locations at each beach. The swim beaches that are monitored are at the following lakes:

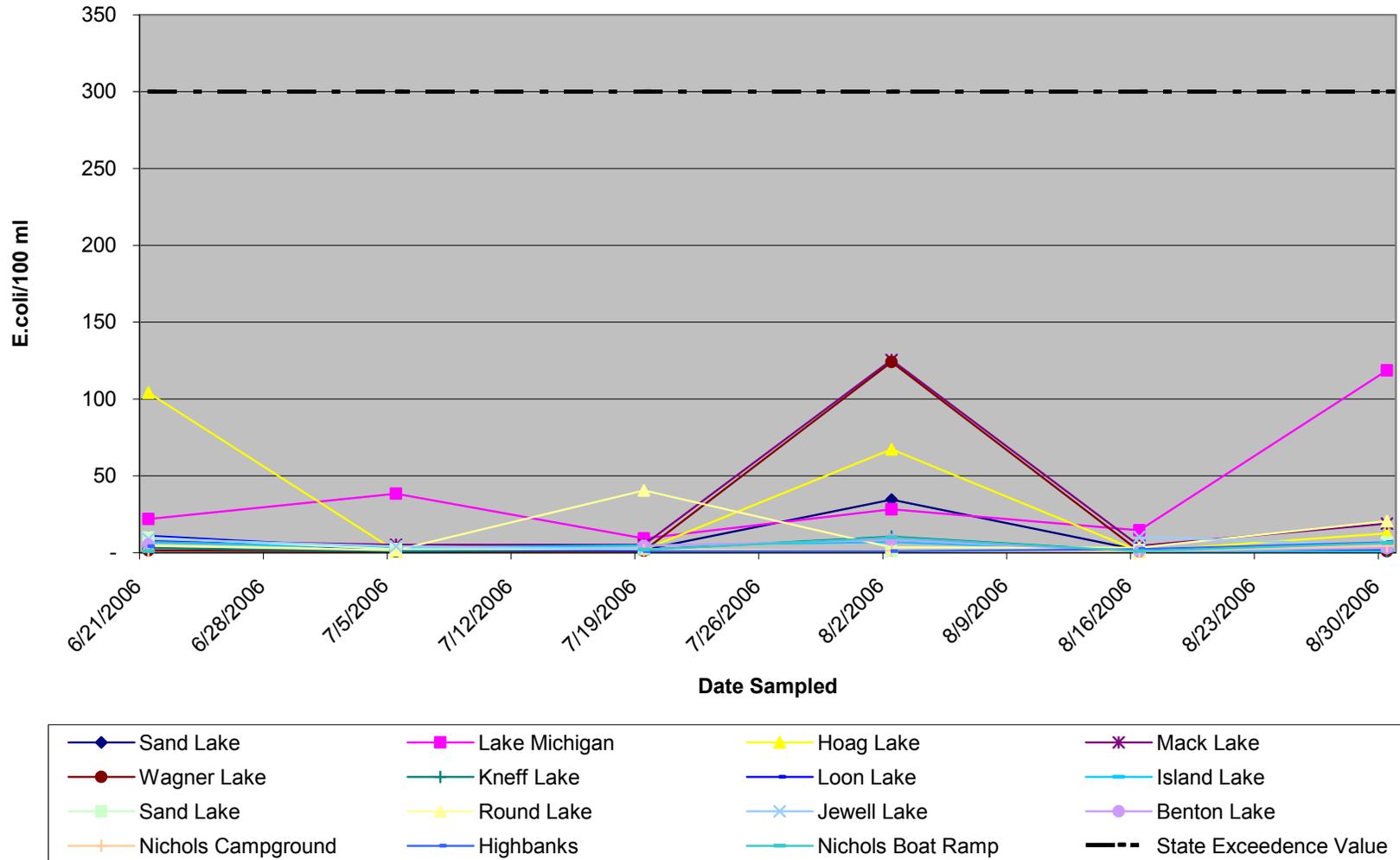


**Table 20. Monitored Swim Beaches**

Ranger District	Huron National Forest	Manistee National Forest
Mio District	Mack Lake Wagner Lake Kneff Lake Loon Lake Island Lake	
Huron Shores District	Sand Lake Round Lake Jewell Lake	
Cadillac-Manistee District		Sand Lake Lake Michigan Hoag Lake
Baldwin-White Cloud District		Benton Lake Nichols Campground Highbanks Nichols Boat Ramp

**Evaluation and Conclusions:** The daily geometric mean calculated from these samples must be below 300 *E. coli* per 100 milliliters for the water to be considered safe for swimming. No samples taken in FY 2006 exceeded 300 *E. coli* per 100 milliliters, as shown in the figure below.

**E.coli Swim Beach Monitoring 2006**



**Monitoring Item: Heritage Resources – Accomplishments**

**Monitoring Driver(s):** G-NR-34, Forestwide Goal: Integrate historical, environmental, and cultural information into plans, assessments, analyses and decision documents, as appropriate.

**Monitoring Question(s):** How many archaeological and historic studies were initiated and completed? How was the information distributed, and did this information benefit National Environmental Policy Act analysis/project planning? Have heritage resources across the Forests been inventoried and protected?

**Background:** Heritage or cultural resources are the remains of sites, structures, or objects used by people in the past. They may be historic, prehistoric, archaeological, or architectural in nature. Cultural resources are actual physical things--places, buildings, artifacts, and documentary evidence relating to a past way of life. The value of preserving significant cultural resources lies in the stories they can tell about former life ways, people's environmental relationships, and human behavior in general. Cultural resource values may be aesthetic, historical, scientific, and/or interpretive and are often dependent on the integrity (lack of disturbance) of the resource and its surroundings. Because of their large land base and relative isolation, national forests preserve an important part of our nation's cultural heritage.

**Monitoring Activities:** Heritage resource management consists of activities designed to help conserve the nation's diverse cultural record and further the public's understanding and enjoyment of that record. Based on the concepts of conservation and stewardship, the program is carried out under several statutory authorities; principally the National Historic Preservation Act. Section 106 of the Act addresses the potential for work projects to adversely affect the cultural record. Under Section 106, reviews and fieldwork are conducted to identify, evaluate, and protect, as needed, heritage resources from the disturbing effects of a wide variety of actions from timber cutting to road reconstruction. In meeting the mandates of Section 106, the Forests' conducted 145 literature and file searches and 104 field survey projects encompassing some 17,250 acres in FY 2006. Thirty-nine new heritage properties were added to the Forests' inventory for a total of approximately 2,050 on the National Forest System lands of the Huron-Manistee National Forests. Information and recommendations resulting from this activity were incorporated into National Environment Policy Act analyses and records and carried through to project implementation as appropriate. Inventory records, including site and survey data, are maintained as paper files but certain basic information is increasingly included in GIS and other databases. Lastly, data recovery excavations were carried out at an archaeological site on the Au Sable River to mitigate potential adverse effects from wave erosion and recreation use. Consultation with the State Historic Preservation Office and the federally recognized tribes with historical ties to the area were carried out in conjunction with the data recovery.

Section 110 of the National Historic Preservation Act mandates a program of proactive stewardship and public involvement. Section 110 activities are supported by direct appropriation although funding is often combined with contributions from partners and other cooperators. Highlights of FY 2006 Section 110 work include the placement of eight interpretive sign panels at the Chittenden Nursery historic district. Forest heritage staff also taught the cultural resources section for the National Wildfire Coordinating Group course "Introduction to Fire Effects", RX 310/340. Course participants learned about the nature of archaeological sites, the effects which fire and fire suppression work can have, and the principles to keep in mind which can minimize negative effects.

Condition monitoring of previously recorded heritage resources occurred opportunistically as project surveys drew staff to nearby locales. Data from these efforts are included in the Forests' inventory files.

**Evaluation and Conclusions:** The Forests are meeting Forest Plan direction for heritage resources in respect to National Historic Preservation Act, Section 106 requirements. Efforts toward improvement in the Forests' heritage work are expected to bring positive results.

<b>Monitoring Item:</b> Minerals
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**Monitoring Question:** Are lease stipulations and permit conditions ensuring sound environmental protection and resource utilization?

**Monitoring Drivers:** G-NR-19, Forestwide Goal: National Forest System lands will be available for non-surface-disturbing minerals exploration and extraction.

G-NR-20, Forestwide Goal: Mineral exploration and development occurs and is consistent with management area direction and subject to valid existing rights. Appropriate restrictions are placed in leases to protect the environment.

G-NR-21, Forestwide Goal: Protect the rights of the federal government, encourage inventory and development of federal minerals, respect state and private mineral rights, and ensure operators take reasonable and prudent measures to prevent unnecessary disturbance to the surface.

**Background:** The Huron-Manistee National Forests have a mixed mineral ownership pattern. Federal, State and private mineral rights can be found within National Forest System lands. The lease rights are granted by different entities for each type of ownership and the degree of control over leasing and subsequent surface use also varies depending upon who owns the mineral rights. Using applicable Federal and State regulatory controls, Forest Plan standards and guidelines, and negotiating terms and conditions of surface use with operators on private minerals, the Forest Service ensures that mineral leasing and development are accomplished in a manner that is consistent with the management area direction. If the mineral ownership is federal, the leasing agency is the Bureau of Land Management (BLM). BLM cannot lease over the objection of the Forest Service and the Forest Service has the authority to restrict surface use as deemed reasonable and necessary to protect surface resources.

**Monitoring Activities:** Producing oil and gas wells and production facilities are inspected at least once per year. Drilling operations are inspected as frequently as necessary to ensure compliance with operating conditions or applicable regulatory controls. Inspections are conducted to validate that stipulations and/or operating conditions are followed, and that protection measures are effective in protection of resource values. In FY 2006, the Huron-Manistee National Forests administered 45 sites to standard. These sites included producing wellsites and production facilities, seismic exploration activity, and drilling activity.

Processing of lease applications and drilling permit applications is done in a manner which is consistent with the direction provided by the Forest Plan. The Forest Plan identifies those federal minerals which are available for leasing and specifies the applicable lease stipulations. The Huron-Manistee National Forests incorporated mandatory regulatory requirements

regarding mineral availability decisions into the recently completed Revised Forest Plan. During the plan revision process, no federal lease applications were processed. No federal minerals under NFS lands were offered for lease in FY 2006. The State of Michigan requests the Forests' recommendations on lease stipulations when leasing State minerals under National Forest System lands. The Huron-Manistee National Forests identifies which State lease stipulations are applicable and ensures comparable protection to that found when leasing federal mineral estate. In FY 2006, the Huron-Manistee National Forests reviewed approximately 13,200 acres of NFS lands to identify necessary lease stipulations where the State of Michigan proposed to lease State mineral interest. When private mineral rights under NFS lands are leased, the Forest negotiates reasonable and necessary surface use conditions with oil and gas operators at the time development is proposed. We rely, to a large extent, on State regulatory controls to ensure resource protection.

**Evaluation and Conclusions:** The Forest Service's authority to control or regulate mineral activity on National Forest System lands is dependent upon who owns the mineral interest. Operations occurring on Federal mineral interest are generally more consistent with Forest Plan direction due to the fact that: 1) we have the ability to provide necessary lease stipulations for inclusion in issued federal leases, and 2) we (Forest Service and the Bureau of Land Management) have more regulatory control over the operations. That is not to say that sites on State or private minerals are not maintained. When concerns arise, the Forests cooperate with the Michigan Department of Environmental Quality to address potential issues or address on-the-ground problems. We foresee that this cooperative relationship will continue in the future, thus enhancing our ability to ensure necessary resource protection measures are implemented.

<b>Monitoring Item:</b> Land Ownership Adjustment
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**Monitoring Question(s):** To what extent have the Forests' land base been adjusted through purchase, exchange, transfer, interchange, boundary adjustment, and donation? What land conveyances, purchases or exchanges have occurred to 1) protect T&E or RFSS species, 2) increase public ownership on lakes and river, 3) acquire unique ecological, scientific, heritage, or recreational qualities, or 4) manage efficiently?

**Monitoring Driver(s):** G-NR-23, Forestwide Goal: Land adjustments (purchase or exchange) will consider only the interest needed to achieve land management objectives and must satisfy one or more of the following purposes: (1) accomplish objectives of public law or regulation; (2) obtain land needed to meet demands for National Forest System resources; (3) result in more efficient land ownership patterns as indicated by reduced resource management costs.

G-NR-24, Forestwide Goal: The priority for land acquisition is to purchase lands or partial interests needed to protect endangered, threatened, and sensitive species and areas possessing unique natural environments or significant cultural resources.

**Background:** On-going land adjustment program of purchases, exchanges, and title claim settlements.

**Monitoring Activities:** Annual submission of LAR/MAR reports to the Regional Office.

**Evaluation and Conclusions:** In FY 2006, the Forests acquired 741.22 acres of non-federal land.