United States
Department of
Agriculture

Forest Service

Huron-Manistee National Forests

2007 Monitoring & Evaluation Report

March 2008

Approval

I reviewed the FY2007 Monitoring & Evaluation Report for the Huron-Manistee National Forests. 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/ Jerry Bird — March 26, 2008

Jerry Bird — Date

Acting Forest Supervisor

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Introduction and Forest Plan Overview

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 stations, 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 serves several 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 2006 Forest Plan or adjustments to management actions,
- Describing to the public how their public lands are being managed.

This document is the second Monitoring and Evaluation Report compiled under the 2006 Huron-Manistee National Forests Forest Plan. 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.

Monitoring and evaluation is described in Chapter IV of the Forest Plan and describes the methods the Forests will use in measuring predicted outcomes and protection of resources and progress toward the desired conditions of the land. The Forest Plan's Monitoring Plan identifies the information needed to make this determination, and guides our monitoring with broad questions to be answered.

A draft *Monitoring Guide* has been developed from the overall guidance in Chapter IV. It expands the broad questions into greater detail and links them to monitoring items by asking more specific questions. It includes a database that comprehensively describes the methodology, costs, timing, data storage location, and priority of each monitoring item. Not all of the items in the database are monitored annually. Some items are scheduled to be monitored less frequently and some are dependent on available funding. Each year, the Forests create a *Monitoring Schedule* that identifies and prioritizes the items to be monitored that year.

In addition to monitoring the items listed in the annual *Monitoring Schedule*, individual project monitoring occurs on a daily basis. *Project Monitoring* helps insure that implementation is occurring as described in project plans and decisions.

Project monitoring is not reported in the Monitoring and Evaluation Report, but is invaluable in ensuring quality work on the ground. Project monitoring may not result in changes to the Forest Plan, but it can affirm our approaches or encourage timely adaptation in our management activities to protect resources.

The following sections summarize the results from the 2007 monitoring items. Each of the resource areas includes background, the monitoring question(s) with findings, and evaluations and conclusions.

The aim of monitoring is adaptive management which is nothing more than responding to current conditions or making appropriate changes based on new information or technology. As a result, the Forest Plan may be amended or revised to adapt to any new information or 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.

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.

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 Chapter IV, Table IV-3 of the 2006 Forest Plan.

Table IV-3, Category 1 elements are shown below; some are covered in Section 1 of this document.

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

Forest Plan Table IV-3. Monitoring Matrix. 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	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
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

Forest Plan Table IV-3. Monitoring Matrix. 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**
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 Plan 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 2 of this document.

Forest Plan Table IV-3. Monitoring Matrix. Desired Condition and Objective Monitoring Items (Categories 2, 3 and 4)

Resource Area	Monitoring Question(s)	Driver: Applicable Code of Federal Regulations (CFR), Forest Plan Desired Condition or Forest Plan Objective	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
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

Forest Plan Table IV-3. Monitoring Matrix. Desired Condition and Objective Monitoring Items (Categories 2, 3 and 4)					
Resource Area	**Monitoring Question(s)**	**Driver: Applicable Code of Federal Regulations (CFR), Forest Plan Desired Condition or Forest Plan Objective**	**Measurement Frequency**	**Evaluation/ Reporting Frequency**	**Precision and Reliability Class**
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
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

Forest Plan Table IV-3. Monitoring Matrix. Desired Condition and Objective Monitoring Items (Categories 2, 3 and 4)					
Resource Area	**Monitoring Question(s)**	**Driver: Applicable Code of Federal Regulations (CFR), Forest Plan Desired Condition or Forest Plan Objective**	**Measurement Frequency**	**Evaluation/ Reporting Frequency**	**Precision and Reliability Class**
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
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

Forest Plan Table IV-3. Monitoring Matrix. Desired Condition and Objective Monitoring Items (Categories 2, 3 and 4).					
Resource Area	**Monitoring Question(s)**	**Driver: Applicable Code of Federal Regulations (CFR), Forest Plan Desired Condition or Forest Plan Objective**	**Measurement Frequency**	**Evaluation/ Reporting Frequency**	**Precision and Reliability Class**
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

Forest Goals and Objectives

In addition to the goals and objectives identified in Table IV-3, Chapter II of the 2006 Forest Plan enumerates further goals and objectives and are shown in the table below:

Table 1. Forestwide Goals and Objectives. Forest Plan, Chapter II – Health and Safety Goals	
Goal Number	**Goal Narrative**
G-H&S-1	• 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	• Encourage adequate fire prevention, fire-safe construction and presuppression activities on private lands in wildland/urban interface fire prone areas.
G-H&S-3	• 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-4	• Suppress fires occurring on private lands inside the Forests' fire protection boundary as defined under established agreements.
G-H&S-5	• 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.
G-H&S-6	• 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-H&S-7	• 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.

Table 1. Forestwide Goals and Objectives. Forest Plan, Chapter II – Health and Safety Goals (continued).	
Goal Number	**Goal Narrative**
G-H&S-8	• Provide for the protection of National Forest System lands and for the property and safety of users.
G-H&S-9	• Provide for Law Enforcement and compliance patrols based on user activity and resource protection needs.
G-H&S-10	• Maintain a transportation system that meets health and safety, resource and administrative needs.

Table 1. Forestwide Goals and Objectives. Forest Plan, Chapter II – Public Relations and Partnerships Goals	
Goal Number	**Goal Narrative**
G-PR&P-1	• Work to achieve informed public consent during development and implementation of land and resource management plans and programs.
G-PR&P-2	• 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.
G-PR&P-3	• Cooperate with and encourage agencies, tribes, states, counties and other partners in education and outreach.
G-PR&P-4	• 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.
G-PR&P-5	• Work with affected American Indian tribes in a government-to-government relationship.
G-PR&P-6	• Use a combination of personal contacts, brochures, maps and informational signing to inform and educate users about forest management.
G-PR&P-7	• Identify and publicize resource management opportunities that will help volunteer organizations, individuals and local communities enhance their self-sufficiency and social well-being.
G-PR&P-8	• Integrate public involvement and forest management with regional and national objectives.
G-PR&P-9	• Work to acquire public input and participation in a timely manner in developing programmatic and site-specific environmental resource management analyses.

Table 1. Forestwide Goals and Objectives. Forest Plan, Chapter II – Natural Resources Goals	
Goal Number	**Goal Narrative**
G-NR-1	• Monitor and evaluate effectiveness of management practices.
G-NR-2	• Manage designated old growth across all management areas and vegetation classes emphasizing old growth characteristics.
G-NR-3	• Integrate the Scenery Management System (see Forest Plan Appendix F-Glossary for definitions) into project-level planning.
G-NR-4	• 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.
G-NR-5	• Monitor wildlife responses to management practices using identified Management Indicator Species to determine the effects of management practices on wildlife and fish populations.
G-NR-6	• Reduce non-native invasive species infestations and prevent new invasive species from becoming established, when possible.
G-NR-7	• 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	• Maintain or improve the populations of endangered, threatened or sensitive species or communities.
G-NR-9	• Manage the 5-mile (8 km) radius around Tippy Dam to benefit the Indiana bat.
G-NR-10	• 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	• Utilize prescribed fire to meet management direction as appropriate for the ecosystems involved.

Table 1. Forestwide Goals and Objectives. Forest Plan, Chapter II – Natural Resources Goals (continued)	
Goal Number	**Goal Narrative**
G-NR-12	• 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.
G-NR-13	• Cooperate with individuals; organizations and local, state, Tribal and federal governments to promote ecosystem health and sustainability across landscapes.
G-NR-14	• 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-15	• 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.
G-NR-16	• Monitor and measure effects at the 5th or 6th level watershed.
G-NR-17	• 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.
G-NR-18	• In cooperation with permittees, favor selective treatment of vegetation in transmission line rights-of-way to improve wildlife forage.

Table 1. Forestwide Goals and Objectives. Forest Plan, Chapter II – Natural Resources Goals (continued)	
Goal Number	**Goal Narrative**
G-NR-19	• National Forest System lands will be available for non-surface-disturbing mineral exploration and extraction.
G-NR-20	• 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	• 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.
G-NR-22	• 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.
G-NR-23	• 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	• 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.
G-NR-25	• Reduce the net miles of roads on the Forests by emphasizing closures of roads determined to be non-essential for resource management.
G-NR-26	• Locate administrative boundaries of recreation areas and place informative signs describing appropriate activities for the area.
G-NR-27	• Cooperate with local communities when considering site-specific proposals that would provide access to services in the local communities.

Table 1. Forestwide Goals and Objectives. Forest Plan, Chapter II – Natural Resources Goals (continued)	
Goal Numberr	**Goal Narrative**
G-NR-28	• Provide for a combination of motorized and nonmotorized recreation opportunities.
G-NR-29	• Provide a variety of access opportunities for a range of user abilities consistent with management area direction and Standards and Guidelines.
G-NR-30	• 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	• 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.
G-NR-32	• Emphasize levels 1, 2 and 3 facilities for developed and dispersed recreation.
G-NR-33	• Manage National Recreation Trails, Byways, Rivers, and Wildernesses in accordance with the commitments associated with their designation.
G-NR-34	• Integrate historical, environmental and cultural information into plans, assessments, analyses and decision documents, as appropriate.
G-NR-35	• Emphasize and promote the use of carry-out methods of trash disposal.
G-NR-36	• All management activities should meet or exceed the Scenic Integrity Objectives established for the Forests through the Scenery Management System.

Desired Future Conditions for the Forests

Table 2. Forestwide Desired Future Condition Goals. Forest Plan, Chapter II – Natural Resources Goals.	
Desired Future Condition Number	**Desired Future Condition Narrative**
DFC-1	• All management activities provide for safe conditions for the public and employees.
DFC-2	• Recreation management provided is compatible with the Recreation Opportunity Spectrum objectives.
DFC-3	• 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	• Designated National Wild, Scenic, and Recreation Rivers are managed according to the management plan for the individual river.
DFC-5	• 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.
DFC-6	• Areas with unique character are protected.
DFC-7	• Prairies, savannahs, and oak-pine barrens have been restored and maintained on approximately 10,000 acres within old-growth areas.
DFC-8	• Maintain favorable conditions of water flow and quality. Management practices will not result in a long-term decline in water quality conditions.
DFC-9	• Indiana bat, Karner blue butterfly, bald eagle, Kirtland's warbler, piping plover and Pitcher's thistle are managed according to their recovery plans.
DFC-10	• Severe and moderately eroding streambanks are restored.
DFC-11	• Habitat needs of riparian-dependent species are met and that habitat is maintained, especially habitat for threatened, endangered and sensitive species.
DFC-12	• 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.
DFC-13	• In-stream large wood meets objectives stated in Table II-2, Forest Plan.

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	• Vegetation Composition objectives for the end of the first decade are displayed in the Forest Plan, Table II-3.

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.

FY2007 Huron-Manistee National Forests Monitoring & Evaluation Report

This report is divided into two sections:

- Section 1 addresses monitoring items that are required by the National Forest Management Act (NFMA), and
- Section 2 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 Legally Required Monitoring

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

Monitoring Question(s): How close are projected outputs and services to actual? How do actual outputs compare to those projected in the 2006 Forest Plan, Appendix D, Proposed and Probable Practices, Goods Produced, and Other Information.

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 2006 Forest Plan.

Background: This monitoring item indicates if forest management activities are being accomplished as outlined in Appendix D of the 2006 Forest Plan, specifically in:

Appendix D, Table D-2. Volume by Vegetation Class Breakdown on Lands Suitable for Timber Production for the First Decade.

Appendix D, Table D-3. Volume by Vegetation Class Breakdown on Lands Note Suitable for Timber Production for the First Decade.

Appendix D, Table D-4. Acres of Proposed and Probable Silvicultural Methods in the First Decade from Lands Suitable for Timber Production.

Appendix D, Table D-5. Acres of Proposed and Probable Silvicultural Methods in the First Decade from Lands Not Suitable for Timber Production.

Appendix D, Table D-6. Proposed Practices (Forest-wide).

Evaluation and Conclusions: The following tables contain the accomplishment information**.**

Table 6. Average Annual Volume Timber SOLD by Vegetation Class on Lands SUITABLE for Timber Production (Table D-2, FP).

Vegetation Class	Aspen/birch	Short-lived conifers	Long-lived conifers	Low-site oak	High-site oak	Northern hardwoods	Firewood	Total MMBF	Total MCF
Forest Plan Projected Average Annual Volume – MMBF	27.1	10.9	30.7	5.2	17.1	0	Included in Vegetation Classes	91.0	
Forest Plan Projected Average Annual Volume – MCF	4,524	1,814	5,118	862	2,850	0	Included in Vegetation Classes		15,167
FY2006 Actual Volume Sold - MMBF	5.1	7.7	14.1	.5		4.0	Included in Vegetation Classes	31.4	
FY2006 Actual Volume Sold - MCF	8.3	12.5	22.9	.8		6.5	Included in Vegetation Classes		51.0
FY2007 Actual Volume Sold - MMBF	4.0	4.7	18.5	2.7		4.8	Included in Vegetation Classes	34.7	
FY2007 Actual Volume Sold - MCF	6.5	7.6	30.1	4.4		7.8	Included in Vegetation Classes		56.4

Table 7. Average Annual Volume Timber SOLD by Vegetation Class on Lands NOT SUITABLE for Timber Production (Table D-3, FP).

Vegetation Class	Aspen/birch	Short-lived conifers	Long-lived conifers	Low-site oak	High-site oak	Northern hardwoods	Firewood	Total MMBF	Total MCF
Forest Plan Projected Average Annual Volume – MMBF	0	2.1	16.8	1.9	4.3	0	0	25	
Forest Plan Projected Average Annual Volume – MCF	0	3.5	28	3.2	7.1	0	0		41.7
FY2006 Actual Volume Sold - MMBF	0	.4	1.8	.1		0	0	2.3	
FY2006 Actual Volume Sold - MCF	0	.6	2.9	.2		0	0		3.7
FY2007 Actual Volume Sold - MMBF	0	.2	2.5	.2		0	5.5	8.4	
FY2007 Actual Volume Sold - MCF	0	.3	4.5	.3		0	8.9		14.0

Table 8. Average Annual Acres of Proposed and Probable Silvicultural Methods in the First Decade from Lands Suitable for Timber Production, Fiscal Years 2006 and 2007 (Table D-4, FP).

Silvicultural Method	Vegetation Class	Aspen/birch	Short-lived conifer	Long-lived conifer	Low-site oak	High-site oak	Northern hardwoods	Total
Thin	Projected in the Forest Plan	0	0	3,543	0	2,402	0	5,945
	Actual Accomplished FY2006	7	4	2,066	20	100	0	2,197
	Actual Accomplished FY2007	**0**	**103**	**1,521**	**0**	**44**	**0**	**1,668**
Clearcut	Projected in the Forest Plan	2,410	1,417	163	524	0	0	4,514
	Actual Accomplished FY2006	782	940	129	197	33	0	2,081
	Actual Accomplished FY2007	**189**	**574**	**212**	**461**	**0**	**0**	**1,436**
Shelterwood	Projected in the Forest Plan	0	0	0	0	826	0	826
	Actual Accomplished FY2006	0	18	62	320	66	0	466
	Actual Accomplished FY2007	**0**	**32**	**0**	**0**	**27**	**0**	**59**
Selection	Projected in the Forest Plan	0	0	0	0	0	0	0
	Actual Accomplished FY2006	0	0	0	0	0	0	0
	Actual Accomplished FY2007	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table 9. Average Annual Acres of Proposed and Probable Silvicultural Methods in the First Decade from Lands Not Suitable for Timber Production, Fiscal Years 2006 and 2007 (Table D-5, FP).

Ecological Restoration Activity	Vegetation Class	Aspen/birch	Short-lived conifer	Long-lived conifer	Low-site oak	High-site oak	Northern hardwoods	Non-forested Dune	Total
Create Barrens	Projected in the Forest Plan	0	13	425	79	255	0	0	772
	Accomplished FY2006	0	80	25	0	0	0	0	105
	Accomplished FY2007	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Create Openings	Projected in the Forest Plan	0	199	530	80	0	0	0	809
	Accomplished FY2006	0	0	53	0	0	0	0	53
	Accomplished FY2007	**5**	**0**	**91**	**0**	**0**	**0**	**0**	**96**
Old Growth to Barrens	Projected in the Forest Plan	0	0	0	0	0	0	0	0
	Accomplished FY2006	0	0	0	0	0	0	0	0
	Accomplished FY2007	**0**	**302**	**0**	**0**	**0**	**0**	**0**	**302**
Old Growth Restoration	Projected in the Forest Plan	0	0	0	0	0	0	0	0
	Accomplished FY2006	0	0	31	0	0	6	48	85
	Accomplished FY2007	**110**	**466**	**53**	**145**	**0**	**6**	**89**	**869**

Table 10. Forest Plan Projected Outputs Compared to Actual Outputs for Fiscal Years 2006 and 2007 (Table D-6, FP).

Management Activity or Practice	Unit of Measure (per year)	Projected Average Annual Amount in the First Decade	FY2006 Actual	FY2007 Actual
Wildlife and Fish				
Manage Terrestrial Habitat	Acres	7,000	1,306	**1,988**
Manage Stream Habitat	Miles	121	33	**36**
Manage Lake Habitat	Acres	240	16	**18**
Nonnative Plant Species				
Manage Noxious Weeds	Acres	4,000	70	**159**
Range				
Manage Rangeland Vegetation	Acres	312	5	**5**
Fuels				
Hazardous Fuels Reduction and Fuelbreaks	Acres	10,000	4,546	**4,804**
Watersheds				
Maintain and Improve Watershed Condition	Acres	100	26	**17**
Facilities				
Decommission Classified and Unclassified Roads	Miles	20	10.2	**3.1**
Improve Transportation System – Roads	Miles	6	.5	**9.8**
Improve Transportation System – Trails	Miles	38	8	**8**
Vegetation				
Establish Forest Vegetation	Acres	5,990	4,300	**1,840**
Improve Forest Vegetation	Acres	935	0	**401**

In FY2007, the Huron-Manistee National Forests offered 56 million board feet but were only able to sell 43 million board feet because of weak pulpwood markets and the negative effect of a large jack pine component offered in some timber sales. Taking advantage of the weak pulp market, biomass utilization plants were at chip capacity. The Forests continue to have a very active personal use firewood program as evidenced by selling almost 6 million board feet of firewood.

The weak timber markets are due in large part to the 2006 closure of the Georgia-Pacific mill in Gaylord. Delivery quotas from the mills were placed on purchasers for all products at various times during the year. Twenty timber sales were offered in FY2007, of which seventeen sold while three received no bids. Two of the no-bid sales consisted of poorer quality jack pine with some aspen; the third sale contained high quality hardwood and red pine but did not sell, due in part because of the large acreage or possibly coming into the hardwood markets at the wrong time. Of the seventeen sold sales offered and sold, two were stewardship contracts which comprised 13 percent of the total timber target.

Timber sale bidding was more competitive in FY2007 compared with FY2006. Subcontractors are used on a majority of sales because of larger sales containing mixed species, contract operations requiring specialized equipment, specified roads, and numerous seasonal restrictions.

Sold and harvest volumes are 47 percent and 36 percent of those projected in the Forest Plan, as shown in Table 11.

Table 11. Average Annual Timber Production Volume by Vegetation Class, Fiscal Years 2006 and 2007.

Vegetation Class	Forest Plan Average Annual Harvest Projection, 1st Decade	Sold Volume FY2006	Harvested Volume FY2006	Sold Volume FY2007	Harvested Volume FY2007
		MMBF		MMBF	
Aspen/Birch	27.1	5.1	3.8	**4.0**	**3.0**
Short-lived Conifer	10.9	7.8	6.6	**4.9**	**6.2**
Long-lived Conifer	30.7	16.6	17.4	**21.0**	**15.9**
Low-site Oak, High-site Oak, and Northern Hardwoods	22.3	4.9	5.3	**7.7**	**2.1**
Firewood	Included in vegetation classes	5.7	5.7	**5.5**	**5.5**
Total	91.0	40.1	38.8	**43.1**	**32.7**

Monitoring Item: **Costs**

Monitoring Question(s): How close are projected costs with actual costs?

Monitoring Driver(s): 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.

Background: Costs of forest management activities, such as stand regeneration, stand improvement and timber harvesting, used in the analysis of the Forest Plan alternatives are found in Table A-12. Costs of Activities, regeneration and Vegetative Class Conversions, Appendix A, Final Environmental Analysis Statement, pages A-14–A-15.

For this evaluation, average timber regeneration activities are compared with activities and associated costs used in the Forest Plan analysis.

Monitoring Activities: Table 12 indicates the forest management activities and associated costs compared with those used in the analysis of the Forest Plan.

Table 12. Average Reforestation Project Costs.

Activity	2006 Forest Plan Costs per acre	Average Costs per acre 2007
Aspen/Birch – Site preparation, natural	$25.00	$40.00
Jack Pine – Site preparation – Kirtland's warbler	$35.00	$85.00
Lowland Conifers – Reforestation, mechanical. Disk trencher, bracke scarifer	$15.75	$45.00

Evaluation and Conclusions:
While actual costs are considerably higher than projected, more comparisons should be done before definitive conclusions can be made.

Monitoring Item: **Social and Economic Stability**

Monitoring Question(s): What are the effects of forest management being planned on land, resources, and communities adjacent to or near the Huron-Manistee National Forests?

Monitoring Driver(s): 36 CFR 219.7(f). Table IV-3, Category 1. 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 Forests 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.

Background: The federal government makes payments to states to cover some of the cost of local government services on tax-exempt National Forest System lands. The states pass those payments on to the counties in which National Forests are located.

Payments in Lieu of Taxes (PILT) payments are calculated and made by the Department of Interior, Bureau of Land Management. These payments are appropriated annually by Congress based on available funding and formulas that take into account the population in the affected counties, the number of acres of federal land in those counties, and other payments received by the counties based on federal land payments.

Payments are also made to states amounting to 25 percent of gross receipts from activities on National Forests, such as timber sales, mining, special uses and recreation. Congress passed the Secure Rural Schools and Community Self-Determination Act (SRS) in 2000, which allowed counties to choose a level payment based on the high-three year average of 25 percent payments, or to continue to receive 25 percent of the current year's receipts. On the Huron-Manistee National Forests, Alcona, Crawford, Montcalm, Ogemaw, and Oscoda opted for the level payment. Iosco, Lake, Manistee, Mason, Mecosta, Muskegon, Newaygo, Oceana, and Wexford Counties continued with the payment based on current annual receipts.

The SRS expired in 2006, but Congress extended it through 2007. If it is not extended or reauthorized, the Forest Service will make the 25 percent payments to all counties based on current year receipts.

Evaluation and Conclusions: The following table shows the breakdown of 25%, SRS payments for FY2006; payments for FY2007 had not been posted at time of publication. PILT payments are shown for FY2006 and FY2007.

Table 13. Payments to Counties.

County	Acres	25% Fund	SRS	FY2006 PILT	FY2007 PILT
Alcona	114,742	$0	$123,083	$45,960	$42,707
Crawford	38,447	$0	$41,208	$35,193	$6,670
Iosco	113,840	$97,524	$0	$76,084	$71,981
Lake	112,437	$97,430	$0	$97,468	$86,370
Manistee	87,701	$75,997	$0	$78,226	$69,558
Mason	60,703	$52,601	$0	$60,021	$53,991
Mecosta	3,459	$2,997	$0	$2,368	$2,030
Montcalm	1,760	$0	$2,163	$2,201	$2,141
Muskegon	12,547	$10,872	$0	$15,970	$14,705
Newaygo	110,963	$96,153	$0	$86,794	$76,871
Oceana	53,342	$46,223	$0	$42,537	$37,288
Ogemaw	20,183	$0	$21,740	$1,194	$2,838
Oscoda	154,534	$0	$163,102	$69,982	$67,824
Wexford	96,877	$83,947	$0	$72,300	$62,796
TOTAL	981,535	$563,744	$351,296	$686,298	$597,770

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 9,629 acres in FY2007. Acres that do not have adequate stocking will be reexamined and a determination made as to which of these lands are necessary to reforest. (Source: FACTS Web Report: Activity Code 4341, Stocking Surveys).

Evaluation and Conclusions: In FY2007, 2,468 acres were certified as satisfactorily stocked. Table 14 indicates the classifications of the certifications.

Table 14. Certification Summary, FY2007.

Type of Regeneration	Acres
Natural Regeneration with Site Preparation	874
Natural Regeneration without Site Preparation	334
Planted Areas	1,260
Seeded Areas	0
Total	2,468

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.

Monitoring Activities: On-going timber program, including monitoring of harvest 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 FY2007, the Forests' sold 43.1 MMBF or 47 percent of the ASQ. Harvest volume in FY2007 was 32.7 MMBF, or 36 percent of ASQ.

In FY2007, sawtimber accounted for approximately 30 percent of the total Forests' timber output, including timber from suitable and not suitable land. The 2006 Forest Plan projected 55 percent of decade 1 would be sawtimber and 45 percent pulpwood. Pulpwood accounted for 70 percent in FY2007.

Table 15. Projected Average Annual Sawtimber and Pulpwood Volume Sold and Actual Sold from Suitable and Not Suitable Land, Fiscal Years 2006 and 2007.				
	Aspen/Birch	**Hardwood**	**Softwood**	**Total**
	MMBF			
Forest Plan Projection - SAWTIMBER Average Annual Sold	6.3	18.8	25.4	50.5
Forest Plan Projection - PULPWOOD Average Annual Sold	20.8	3.5	16.2	40.5
2006 SAWTIMBER Sold	1.7	1.2	8.5	11.4
2006 PULPWOOD Sold	3.4	3.6	16.0	23.0
2007 SAWTIMBER Sold	**1.8**	**2.9**	**8.3**	**13.0**
2007 PULPWOOD Sold	**2.2**	**4.9**	**23.0**	**30.1**

Table 16. Sold Timber Volumes (MMBF)	
Fiscal Year	**Sold**
Implementation of the 1986 Forest Plan	
1986	81.0
1987	82.7
1988	82.8
1989	90.6
1990	79.0
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	43.0
2001	22.3
2002	41.5
2003	29.8
2004	52.8
2005	40.8
Total - 1986 Forest Plan	1213.0
Total - 1986 Forest Plan, Average MMBF/Year	60.7
Implementation of the 2006 Forest Plan	
2006	40.1
2007	**43.1**

Figure 1 and Figure 2 below compare sold volumes and harvest volumes with Annual Sale Quantity (ASQ).

Figure 1. ASQ and Sold Volumes, 1986-2007

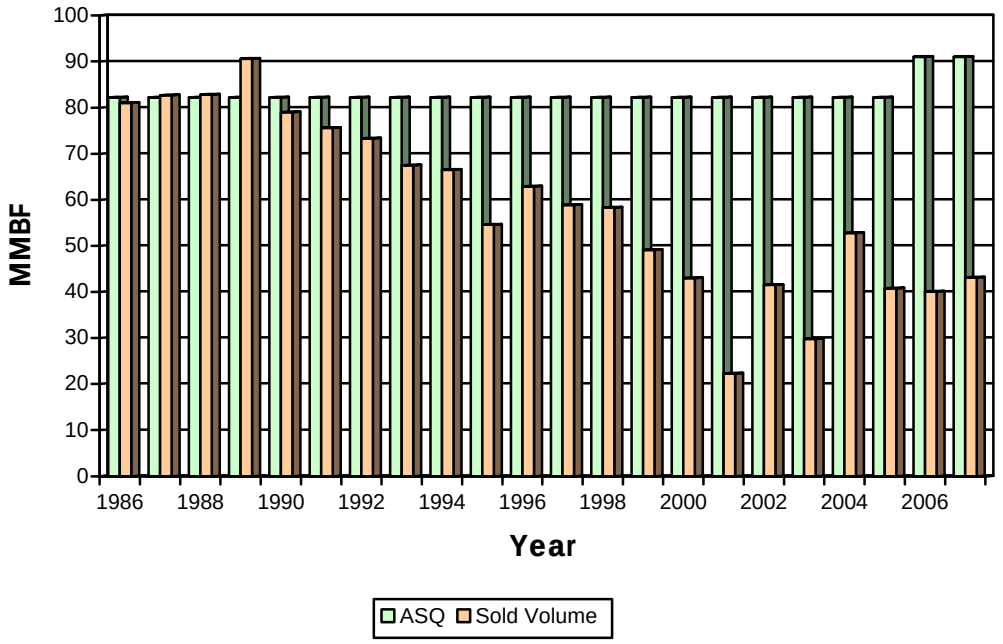
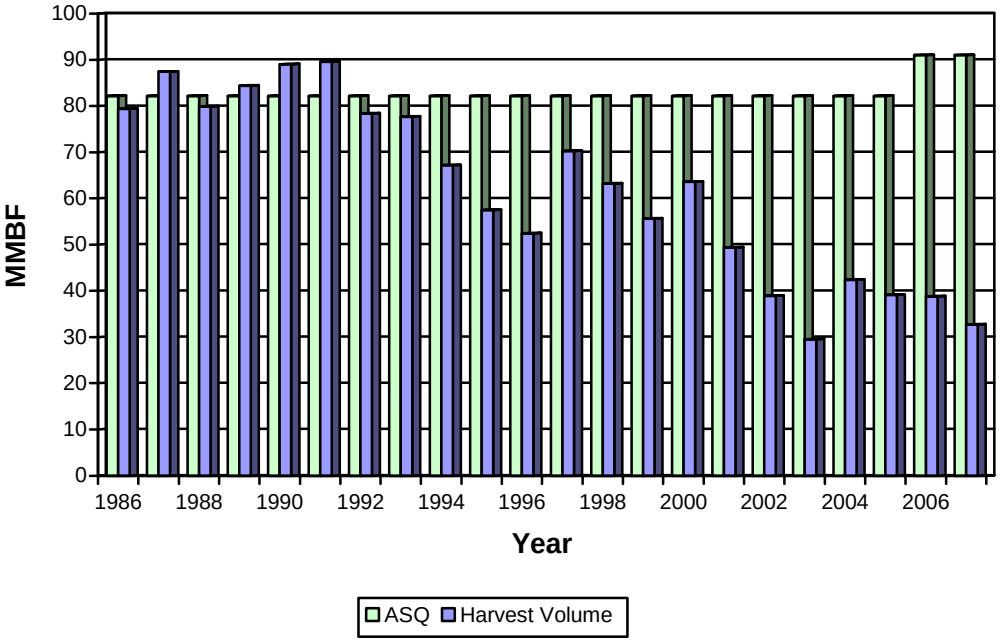


Figure 2. ASQ and Harvest Volumes, 1986-2007



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

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.

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

Brook Trout and Mottled Sculpin

Monitoring Activities: As indicated in the FY2006 M & E Report, the monitoring protocol for brook trout and mottled sculpin was developed in 2006 and is currently still being implemented within budgetary constraints. 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 35 times 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 17). 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 Plan implementation).

Table 17. 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 [1]	Manistee	White River	Newaygo
Peterson Creek	Manistee	Manistee River	Wexford/Manistee
Pine Creek [2]	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

[1] Mena Creek will be sampled upstream of the impoundment (Minnie Pond).
[2] Pine Creek will be sampled upstream of Steinberg Road.

References cited in this monitoring item:

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

Wang, L., J.L. Lyons, P. Kanehl, and R. Gatti. 1997. Influences of watershed land use on habitat quality and biotic integrity in Wisconsin streams. Fisheries 22(6):6-12.

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

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.

Forest Plan Goal, G-NR-5: 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 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 below, 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 Pipistrelle, 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 above, under Endangered, Threatened and Sensitive species.

Brook Trout -- is covered elsewhere, under Fisheries Habitat.

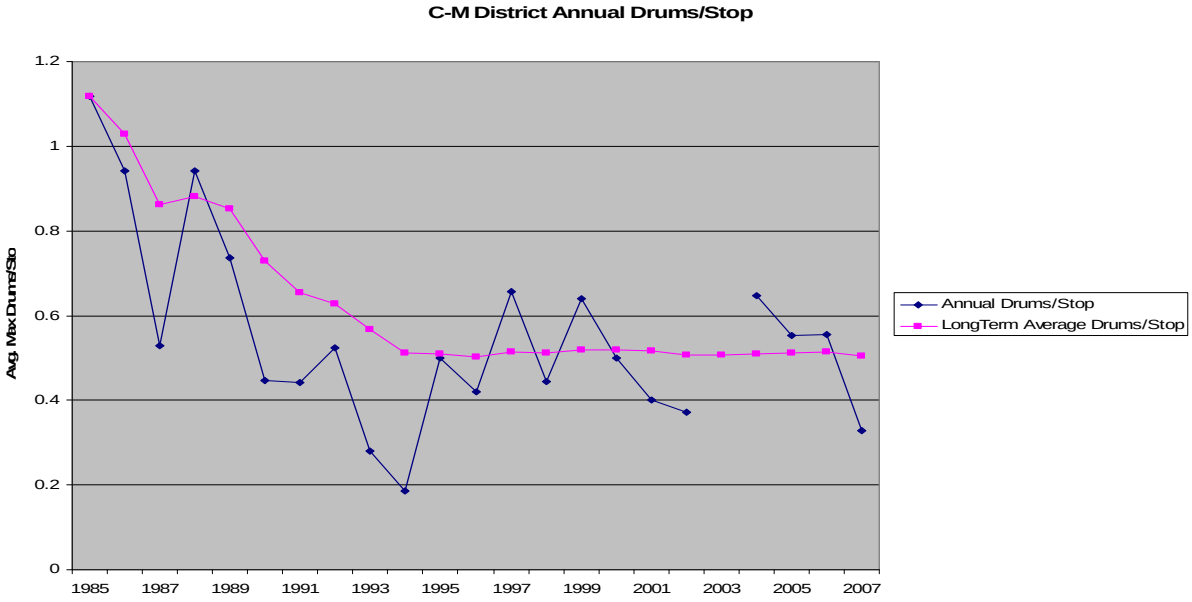
Mottled Sculpin – is covered elsewhere, under Fisheries Habitat.

Ruffed Grouse

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 Kellogg Tower, Grant Township Grouse Management Unit (GMA), and Pine River GMA routes; Tribal surveyors assess the Wagon Wheel GMA route on NFSL, as well as 1836 Reservation, 1855 Territory, and Thompsonville routes.

In 2007, drums per stop averaged only 0.328 on Forest Service routes, the lowest index since 1994 (no counts were taken in 2003). 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:

Figure 3. Cadillac-Manistee Ranger District Annual Ruffed Grouse Drumming Stops



By contrast, Tribal counts averaged 1.43 drums per stop, Pine River GMA count reached 0.647 drums per stop, and Wagon Wheel GMA route count reached 0.6 drums per stop, in areas managed specifically for ruffed grouse.

Only 2 American Woodcock singing-count routes were run on the Forests in 2007. Michigan DNR was unsuccessful in recruiting surveyors for 3 additional routes. Only 1 woodcock "peent" call and one flight song were heard on Forest routes. We are unable to evaluate woodcock populations, or effects upon them of our management, from this limited effort.

Evaluation and Conclusions: Existing information suggests that most forest vegetation type acres are consistent with the projections in the 2006 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.

Acreage of annual compartment exams needs to be increased to collect vegetation data to continuously upgrade information and the database. The Forests need to make steady improvements in gathering better vegetation information and improving databases.

Section 2 – Attainment of Goals and Implementation of Standards & Guidelines

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

Monitoring Question: What standards and guidelines or objectives are not being met?

Monitoring Driver(s): 36 CFR 219.12 (k). Table IV-3, Categories 2, 3, & 4. 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.

Three Standards/Guidelines were evaluated:

1 Forest Plan Standard, 2500 Watershed Management, 7a: Forest management activities will not degrade long-term stream water quality below State standards.

Background: The Michigan Department of Environmental Quality (DEQ) Surface Water Assessment Section develops standards for the protection of water quality and monitors water, sediments and aquatic life to ensure the viability of our aquatic ecosystems, that water quality standards are being met, and that surface waters meet designated uses.

The DEQ conducted this monitoring on the mainstream and tributaries of the Au Sable River watershed (Huron National Forest) in 2007, using the Great lakes Environmental Assessment "Procedure 51" (Creal et al. 1996). The focus was on water quality, fish, and macro-invertebrate populations. A report will be forthcoming in 2008.

Evaluation and Conclusions: The results from the 2005 DEQ sampling in the Pere Marquette River watershed (Manistee National Forest) were released in 2007 (Michigan Department of Environmental Quality 2007). Salmonids were collected at two of the three stations during fish community surveys, indicating habitat and water quality are suitable for supporting the designated coldwater fishery. Overall, the macro-invertebrate communities rated from acceptable to excellent with a fair number and relative abundance of sensitive taxa present at many stations. Habitat rated from marginal to excellent. In general, instream habitat at many of the Pere Marquette River tributaries was impacted by sand bedload. Water chemistry results were within the range of expected concentrations. These survey results are consistent with previous survey results. Thus, water quality standards are being met within the Pere Marquette River watershed.

References cited in this monitoring driver, included:
Creal, W., S. Hanshue, S. Kosek, M. Oemke, and M. Walterhouse. 1996. Update of GLEAS Procedure 51 Metric Scoring and Interpretation. MDEQ Staff Report No. MI/DEQ/SWQ-96/068. Revised May 1998.

Michigan Department of Environmental Quality. 2007. A Biological Survey of the Pere Marquette Watershed: Mason, Oceana, Lake, and Newaygo Counties, Michigan July and August 2005. Water Bureau Staff Report MI/DEQ/WB-07/102.
2) Forest Plan Guideline, 2500 Watershed Management, 7b: Forest management activities will not increase the trophic levels of lakes.

2 Forest Plan Goal, G-NR-17: 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.

Background:
There is not a well-documented cause and effect relationship from Forest Service land management actions and changes in fish populations in lakes on the National Forests. Thus, a MIH approach will be employed for warmwater lakes (the vast majority of the lakes on the National Forests) to monitor the health of these lentic ecosystems.

Warmwater lakes MIH – the trophic status of the lake will be maintained. It is proposed to use the trophic status guidelines listed in the Forest Plan, Chapter II, 2500 Watershed – Water Quality to serve as an indicator for maintaining the habitat quality for warmwater mesotrophic and eutrophic lakes. These are:

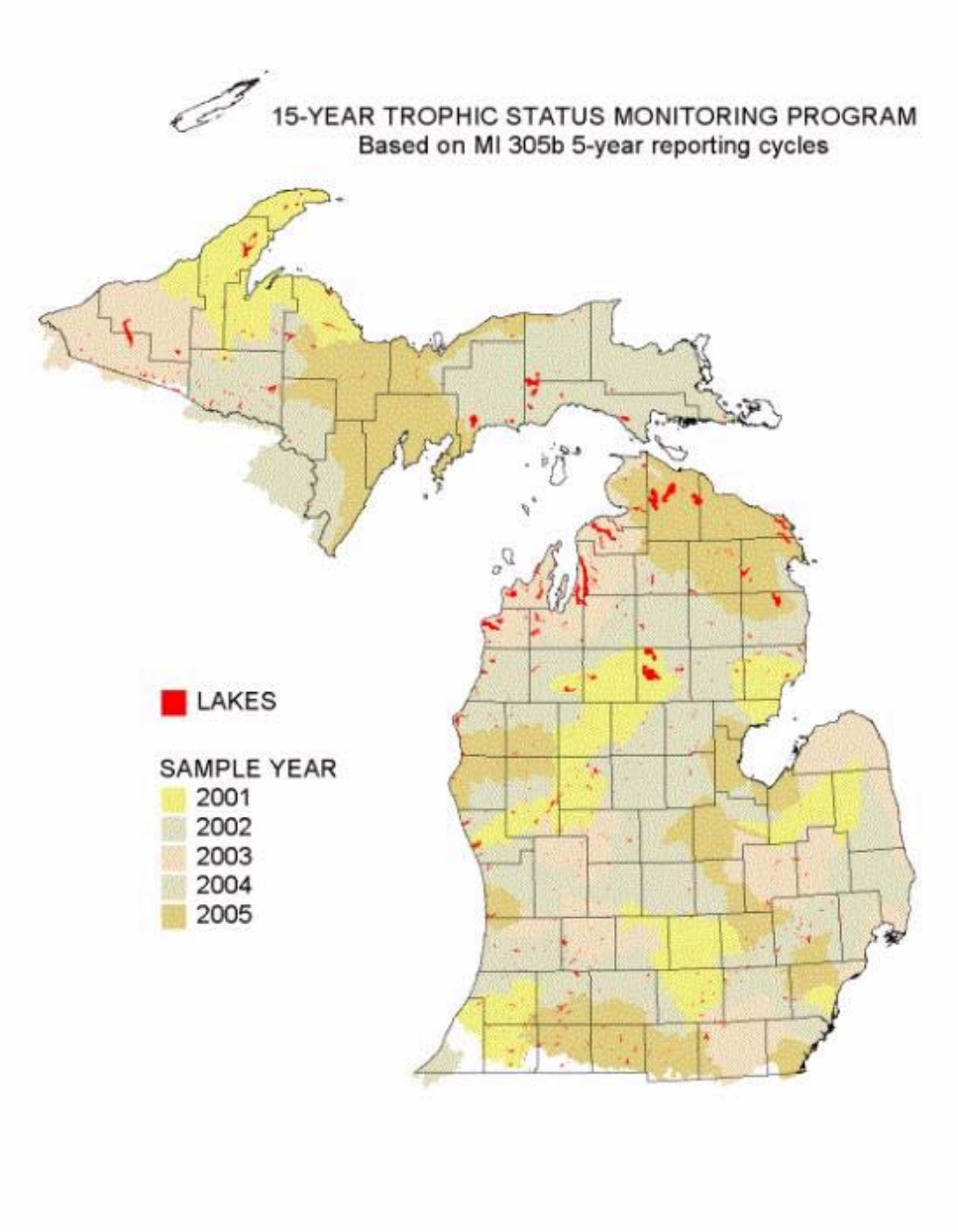
- Mesotrophic lakes - No more than a 10 % decline in the Carlson trophic state index will be permitted for all lakes with National Forest ownership.
- Eutrophic lakes with National Forest ownership will meet "fishable and swimmable" criteria contained in the Clean Water Act.

As with streams, representative lakes are being sampled. Ideally, these lakes have 100 percent National Forest ownership of the shoreline and be located in watersheds with predominantly National Forest ownership (again, to reduce the variation in sources that could contribute to any changes in the trophic status). The monitoring of these lakes is part of an ongoing statewide water resources monitoring being jointly conducted by the Michigan Department of Environmental Quality and United States Geological Survey. The Forest Service began collaborating with this effort in 2004 so that more lakes from the Huron-Manistee National Forests could be sampled and with greater frequency. This program is summarized below (information taken from the USGS website *http://mi.water.usgs.gov/progproj.php).*

Michigan has nearly 3,500 lakes over 25 acres in size. Of these lakes approximately 730 are accessible to the general public. The USGS, in cooperation with MDEQ, has designed

and is implementing a statewide network to assess the current trophic status and water quality conditions of these public waters.

Each lake will be evaluated once in a fifteen-year period starting in 2001. During its specified year each lake will be sampled once in early spring and once in late summer to determine water-quality characteristics. The year that the lake will be sampled is determined by the watershed unit in which the lake is located. Each year, 7 to 10 of the 45 major watersheds in Michigan will be monitored and assessed. These basins are monitored on a five-year cycle.



Evaluation and Conclusions: None of the above lakes were sampled through the joint DEQ – USGS statewide sampling program in 2007. However, data collected as part of this program from 2001-2004 is summarized in the attached Table 18 and shall serve as the baseline for Forest Plan monitoring purposes. Overall, the majority of the selected lakes are oligotrophic in nature with the remainder being mesotrophic.

Table 18. Baseline water quality for selected lakes on the Huron-Manistee National Forests as expressed by the Carlson Trophic Index.

Lake	National Forest	Watershed	County	USGS Site Number [2]	Year	Secchi (meters)	Carlson'sTI $_{secchi}$ [3]	Chlorphyll a (ug/l)	Carlson'sTI $_{chloro\ a}$ [3]	TI Average	Trophic Status [4]
Island Lake	Huron	Au Sable	Oscoda	443029084084001	2004	4.00	40.023	1.25	32.789	36.406	Oligotrophic
Loon Lake	Huron	Au Sable	Oscoda	443104084080601	2004	4.50	38.326	1.10	31.535	34.931	Oligotrophic
Little Au Sable Lake	Huron	Au Sable	Ogemaw	442627083553302	2004	3.90	40.388	1.50	34.578	37.483	Oligotrophic
Sand Lake	Huron	Au Gres-Rifle	Iosco	441938083403505	2001, 2004	2.70	45.687	---	---	45.687	Mesotrophic
Mack Lake	Huron	Au Sable	Oscoda	443439084041203	2003	---	---	3.25	42.163	42.163	Mesotrophic
Sprinkler Lake	Huron	Au Sable	Alcona	443606083362701	2004	4.65	37.854	1.35	33.544	35.699	Oligotrophic
Wagner Lake	Huron	Au Sable	Oscoda	443309084090001	2004	3.30	42.796	1.05	31.079	36.937	Oligotrophic
Jewell Lake	Huron	Au Sable	Alcona	444045083363801	2002, 2003	3.10	43.696	2.65	40.160	41.928	Mesotrophic
Amaung Lake	Manistee	Pere Marquette	Newaygo	434610085530101	2003	6.45	33.139	1.75	36.366	34.752	Oligotrophic
Benton Lake	Manistee	White	Newaygo	434014085532301	2003	2.70	45.687	1.80	36.090	40.889	Mesotrophic
Hoags Lake	Manistee	Pere Marquette	Mason	440849086114001	2003	3.05	36.160	3.80	36.366	36.263	Oligotrophic
Nichols Lake	Manistee	White	Newaygo	434344085543001	2003	5.23	43.931	1.80	43.696	43.814	Mesotrophic
Round Lake	Manistee	Muskegon River	Mecosta	433727085183005	2006	2.55	46.511	---	---	46.511	Mesotrophic
Twinwood Lake	Manistee	Muskegon	Newaygo	432824085455901	2003	2.85	41.743	8.35	48.339	45.041	Mesotrophic
Pine Lake	Manistee	Manistee	Manistee	441150086001701	2004	3.55	44.908	6.10	51.419	48.164	Mesotrophic
Sand Lake	Manistee	Manistee	Manistee	440946085562601	2004	6.20	33.708	1.10	31.535	32.622	Oligotrophic

[1] Based on USGS-Michigan DEQ Joint Statewide Water Quality Monitoring Program

[2] Unique code that can be used to access data at National Water Information Web Site (http://nwis.waterdata.usgs.gov/usa/nwis/qwdata)

[3] TI = Trophic Index, a measure of the nutrient level of lakes as developed by Carlson (1977)

[4] Trophic Index values < 40 = Oligotrophic, 40-50 = Mesotrophic, > 50 = Eutrophic (very productive) trophic states

3 Forest Plan Guideline, 2500 Watershed Management, 4b: Natural, in-stream or added wood–trees, shall be left undisturbed unless it constitutes 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: 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) cutting to facilitate passage of recreational watercraft.

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. As stated above, logjams help reduce erosion, provide habitat for fish and wildlife and are an important part of the natural processes of a river system. Now 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 do that work.

Evaluation and Conclusions: 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.

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

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.

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

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

Forest Plan Goal, G-NR-10: 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.

Monitoring Activities: The following table and narration contain accomplishments of management activities with the goal of encouraging wildlife populations.

Table 19. Wildlife Projects Completed in FY 2007.

Mio Ranger District	Unit
Create large woody debris in riparian areas	1,130 ac.
Opening Improvement (mechanical)	191 ac.
Prescribe burn openings (reported above)	129 ac.
Impoundment maintenance	3 structures
Aspen clearcut for regeneration (Ruffed grouse, golden-winged warbler)	107 ac.
Jack pine clearcut for regeneration (Kirtland's warbler and other species)	686 ac.
Cadillac-Manistee Ranger District	
Brushing, mowing or masticator use for opening maintenance	279 ac.
Prescribed burning in fire-dependent ecosystems	66 ac.

Foote Wildlife Opening and Impoundment

In FY2007, the Forests accomplished 1,988 acres of habitat management, for white-tailed deer, wild turkey, ruffed grouse, woodcock, butterflies, eastern bluebird, upland sandpiper and various other landbirds that benefited from these 27 projects. Early successional vegetation was managed (1,492 acres), prairies and grasslands restored (489 acres), and fire-dependent ecosystems were managed by prescribed fire.

The Forests restored over 39 miles of streams (13.5 miles anadromous, nearly 26 miles inland coldwater) with partner support.

District Wildlife Biologists (Chris Schumacher, top left; Phil Huber, top right; Paul Thompson, center right) & NWTF Biologist Randy Showalter Visiting Cooperative Wildlife Openings

Partner contributions were vital to Forest accomplishments for fisheries, wildlife and Endangered, Threatened and Sensitive species in 2007. Partner dollars ($505,280) and in-kind contributions ($167,645) more than doubled 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 Common Loons, 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 extend the Forests' resources, and make more conservation projects possible to effectively address a wide variety of species and their habitats.

Table 20. Huron-Manistee National Forests Wildlife Partners	
Partner Name	**Number of Projects**
Bahamas National Trust	2
Big Sable Watershed Restoration Committee	1
Conservation Resource Alliance	5
Consumers Energy	2
Eastern National Forests Interpretation Association	1
Federated Garden Clubs of Michigan	2
Ferris State University	1
Fremont Area Foundation	2
Grand Valley State University	1
Huron-Pines Resources Conservation and Development Council	1
Kirtland Community College	1
Lake Mitchell Improvement Board	1
Land Conservancy of West Michigan	1
Land Information Access Association (LIAA)	1
Larry Copley	1
Little Manistee Watershed Conservation Council	1
Little River Band of Ottawa Indians	5
Manistee County Road Commission	1
Mason County Road Commission	1
Michigan Conservation Foundation	1
Michigan Department of Environmental Quality	1
Michigan Department of Natural Resources	15
Michigan Entomological Society	1
Michigan Federated Garden Clubs	1
Michigan Loon Preservation Association	1
Michigan River Guides Association	1
Michigan State University	2
Michigan Wildlife Conservancy	2
Muskegon River Watershed Assembly	1
National Forest Foundation	1
National Wild Turkey Federation - Michigan	7
Nixon family	1
Northeast Michigan Sportsmen Club	1
Nowhere Duck Club	1
Pere Marquette Watershed Council, Inc.	3
Pheasants Forever	1
Pine River Association	2
Postupalsky, Sergi	1
Red Cedar Flyfishers	1
Smith, Dave	2
The Nature Conservancy - Michigan	3
Timberlands Resource Conservation & Development Council	1
Trout Unlimited - Muskegon/White River	1
USDI Fish and Wildlife Service	9
USDI USGS - Patuxent Wildlife Research Center	1
Volunteers of the Mio Ranger District	2
Wal-Mart	2
Wellston Boosters Association	1
Wexford County Road Commission	1
Wittenberg University	1
Total Number of Partners: 50	100

Monitoring Item: **Minimum Viable Fish 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.

Two monitoring drivers were evaluated:

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

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

Background: Management of streams focused on improving habitat for resident and potomodromous coldwater species, including MIS 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 heelspiltter mussels). A total of 36 miles of stream habitat were improved. Stream habitat work included sediment basin maintenance, streambank stabilization, instream cover structure construction and repair, improvement of road-stream crossings, and large wood enhancement.

Partnerships played a vital role in the implementation of the Forest's 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). The Forest Service completed habitat improvements on public lands in 2006. Remaining installations on private lands took place in 2007.
- Little Manistee River cover enhancement (Little Manistee River Watershed Conservation Council, Conservation Resource Alliance).
- Manistee River erosion control (Little River Band of Ottawa Indians, U.S. Fish and Wildlife Service, EPA).
- Pere Marquette and Little Manistee River sediment basin maintenance (Pere Marquette Watershed Council, Little Manistee River Watershed Conservation Council).

Partner contributions to these stream and watershed improvement projects on the National Forests were approximately $400,000.

Evaluation and Conclusions: Site-specific monitoring of representative habitat improvement is ongoing. The Michigan Department of Natural Resources is evaluating the effectiveness of the Little Manistee River sediment basin as part of a larger, state-wide study (Wills 2006). Mean channel depth increased both upstream and downstream of the sediment trap after two years. Gravel substrates also increased upstream and downstream of the sediment trap.

In addition, three other monitoring studies were ongoing in 2007 to evaluate the response of fish populations to habitat restoration activities.

The Little River Band of Ottawa Indians Natural Resources Department is currently monitoring brook trout and mottled sculpin in three tributaries of the Manistee River, including Pine Creek (listed above) in collaboration with Grand Valley State University. To date, significant responses in the fish community have not been observed in Pine Creek following upgrade of faulty culverts (Nault et al. 2007).

However, improvements were only instituted two years ago and the Little River Band Natural Resources Department will continue to monitor. Movement patterns of mottled sculpin in response to stream restoration practices in Sickle Creek (replacement of a perched culvert with a bottomless con-span road crossing) indicate that sculpin were limited in movement above the formerly perched culvert and now are more evenly distributed throughout the stream system (Deboer et al. 2007).

Ongoing monitoring of the fish population and channel response to the removal of Stronach Dam on the Pine River demonstrated that salmonid numbers have increased upstream of the former dam site due to channel incisement and deepening in the former impoundment area (Burroughs and Hayes 2007). During the period of dam removal, brown trout and rainbow trout densities have steadily increased, and are now 5-6 times higher than they were at the start of the dam removal (Burroughs 2005).

References cited in this monitoring item:
Burroughs, B.A. 2005. Summary of the Stronach Dam Removal Study. Summary written for a publication by American Rivers, 2/21/2005.

Burroughs, B.A. and D.B. Hayes. 2007. Effects of Dam Removal on Fluvial Geomorphology and Fish. Ph.D. Dissertation, Department of Fisheries and Wildlife Biology, Michigan State University

Deboer, J.A., K.N. Nault, M. Holtgren, S. Ogren, and E.B. Snyder. 2007. Fish response to habitat restoration on Sickle Creek, a first-order tributary of the Big Manistee River. Proceedings of the 68th Annual Midwest Fish and Wildlife Conference, Madison, WI (abstract only).

Nault, K.N., J.A. Deboer, M. Holtgren, S. Ogren, and E.B. Snyder. 2007. Changes in substrate composition (and fish assemblage) following road-stream crossing improvements on Pine Creek, Manistee County, Michigan. Proceedings of the 68th Annual Midwest Fish and Wildlife Conference, Madison, WI (abstract only).

Wills, T.C. 2006. Effects of sediment traps on Michigan river channels. Michigan DNR Study Performance Report, Federal Aid Project F-80-R-7.

2 Forest Plan guidelines call for the restoration of large wood to meet the desired future conditions.

In-stream large wood meets objectives as stated in the 2006 Forest Plan:

Stream Order	Number of large wood structures per 300 feet of stream
1-2	6-9 (108-160 per mile)
3-4	3-6 (54-108 per mile)

Monitoring Activities: Counts were made of large wood previously placed in the in the Au Sable River. Monitoring was done by the Forest Service and other partners in the actual restoration of large wood.

Evaluation and Conclusions: Based on the counts of wood in the 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 blend in with their natural surroundings. These findings are consistent with more quantitative GIS-based monitoring that was done previously (Hudy et al. 2005).

It was observed that clusters of placed trees fared better than individually placed trees in the Au Sable River large wood restoration project. Therefore, more emphasis will be placed on creating this type of habitat complex in future work. Placed hardwood trees blended in sooner, although placed red pine did weather after a few years, looking more natural. Work implemented on the Manistee River in October, 2007 included a mix of both tree types.

References cited in this monitoring item:
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 66th Annual Midwest Fish and Wildlife Conference, Grand Rapids, MI (abstract only).

Monitoring Item: **Wildlife and Vegetation Management — Early Successional Habitat**

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.

Forest Plan Goal, G-NR-7: 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.

Ruffed Grouse Society Sponsored Aspen Regeneration Project: **"Before"**

Ruffed Grouse Society Sponsored Aspen Regeneration Project: **"After"**

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.

In 2007, the following was accomplished on the Mio Ranger District:

- 1,130 acres - Create large woody debris in riparian areas
- 3 structures – Impoundment maintenance

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. The Forests need to increase aspen harvesting to provide early successional habitat and aspen commodity production, as market forces and budgets allow. The public should anticipate accomplishment levels less than the estimated 2,410 acres yearly in the Forest Plan. After meeting goals for Endangered and Threatened species habitat (Kirtland's warbler and Karner Blue Butterfly), aspen/early successional habitat should be the next highest vegetation management priority.

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

Monitoring Question: To what extent are habitat conditions for RFSS aquatic species being maintained or improved?

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

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

Lake Sturgeon

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. During 2007, lake sturgeon monitoring was a cooperative effort headed up by the Little River Band of Ottawa Indians Natural Resources Department. Other cooperators included the Fish and Wildlife Service, Michigan Department of Natural Resources, Forest Service, Great Lakes Fishery Trust, Central Michigan University, and Michigan Technological University.

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 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, sturgeon are released back into the stream. In 2007, 29 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.

The Little River Band and Michigan Technological University are currently comparing performance in early-life history of streamside-reared and wild-reared Lake Sturgeon in the Manistee River. In 2007, larval sturgeon drift and abundance were

monitored and telemetry utilized to determine habitat use and movement patterns of juvenile fish. Preliminary results indicate that there is no difference in growth, movement and habitat use between streamside reared sturgeon and wild sturgeon (Mann et al. 2007). Both wild and reared juvenile sturgeon were found on a mix of sand and gravel substrate. Average depth located was 1.6 meters (4-5 feet).

Survival of streamside reared sturgeon has been documented by the observation of recaptured sturgeon during surveys. Two sturgeon released in 2006 were recaptured in the Big Manistee River during surveys conducted in the summer/fall of 2007 by the Little River Band and Michigan Tech. Also, a fish released from the streamside rearing facility in 2005 was captured in October of 2007 by the State of Michigan in Lake Michigan off of Grand Haven.

The Manistee River sturgeon spawning population is currently being evaluated through genetic analysis procedures. An estimate of spawners will be estimated for 2005-2007 from tissue samples collected from streamside reared and wild captured Manistee River sturgeon. This project is a collaboration between the Little River Band and Michigan State University.

Greater Redhorse

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.

Over eight days, Forest Service personnel sampled fish passage through the ladder during April 13 through June 8, 2007. A total of 214 redhorse suckers passed through the fishway ladder during this time with the majority being golden or shorthead redhorse suckers. A total of 24 greater redhorse suckers were captured and released upstream during the eight days sampled.

Channel Darter

The channel darter, *Percina copelandi,* is a State-endangered species in Michigan. A survey by Schultz (1986) documented its occurrence in the Pine River – Van Etten Lake subwatershed of the Au Sable River watershed. Follow-up surveys in 2000-2001 verified its continued presence
(Thompson et al. 2001).

Conservation measures in the 2006 Forest Plan call for periodic monitoring of known populations of the channel darter (USDA Forest Service 2006). Therefore, sampling at previous documented locations within the Pine River system was undertaken in 2007. The objective was to see if channel darters were still present at these locations.

Three locations in the Pine River system where this species was documented to occur in 2000 were sampled in 2007 (Schnurer and Stuber 2007). Channel darters are still present in the Pine River system; however, only at one of the three sites where found in 2000.

2007 numbers at this site were 2/3 of the reported 2000 level (35 versus 51, respectively). And, while none were captured at the other two sites, the number of channel darters reported in 2000 from these sites was low (< 5). Thus, while their absence in 2007 is of concern, it is not considered catastrophic. Another point of interest related to endangered species was of the presence of logperch (*Percina caprodes*), the host fish for the State-endangered snuffbox mussel (*Epioblasma triquerta*). Follow-up monitoring is recommended to determine: (1) if the lower numbers of channel darters encountered in 2007 are a trend or simply natural variation in population levels; and, (2) if the snuffbox mussel occurs within this system.

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 mangers in the continued restoration of the Manistee River sturgeon population. Identification of habitat and river retention time of reared juvenile sturgeon will aide in rehabilitation efforts (Mann et al. 2007).

Greater redhorse suckers are still present in the Pere Marquette River system. In fact, significantly greater numbers were observed at the fish passage facility than in 2006 (24 versus one). Ongoing monitoring at the weir will allow for a trend analysis over time.

Channel darters are still present in the Pine River – Van Etten Lake system. However, follow-up monitoring is recommended to determine: (1) if the lower numbers of channel darters encountered in 2007 are a trend or simply natural variation in population levels; and, (2) if the snuffbox mussel occurs within this system.

Monitoring for sensitive mussel species (snuffbox, creek heelsplitter) needs to be undertaken in the future, adapting an approach developed by Dunn (2000).

References cited in this monitoring item:

Baker, E. A. 2006. Lake Sturgeon Distribution and Status in Michigan, 1996–2005. Michigan Department of Natural Resources, Fisheries Technical Report 2006-4, Ann Arbor

Dunn, H.L. 2000. Development of strategies for sampling freshwater mussels (Bivalvia: Unionidae). Pp. 161-167 in Proceedings of the First Freshwater Mollusk Conservation Society Symposium, Ohio Biological Survey.

Mann, K., M. Holtgren, and N. Auer. 2007. Habitat selection by juvenile wild and reared lake sturgeon in the Big Manistee River, Michigan. Proceedings of the 68th Annual Midwest Fish and Wildlife Conference, Madison, WI (abstract only).
Schnurer, K.M. and B. Stuber. The occurrence of channel darters (*Percina copelandi) in* known locations in the Pine River system on the Huron National Forest, Michigan. Poster Presentation at the 68th Annual Midwest Fish and Wildlife Conference, Madison, WI.

Monitoring Item: **Wildlife 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.

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

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

Monitoring Activities: Of the 142 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 5 Endangered or Threatened species and Critical Habitats on the Forests.

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 196 new occurrences of 29 RFSS species (plus 2 others) to Michigan Natural Features Inventory in 2007.

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.

Pine Marten
(http://www.dnr.state.wi.us/org/land/er/factsheets/mammals/Marten.htm)

Northern Goshawk
Six breeding Northern Goshawk pairs (5 in Cadillac-Manistee District, 1 in Baldwin-White Cloud District), were located on Manistee National Forest by Sergei Postupalsky in 2007. Three of 19 known nests successfully fledged 9 young. In addition, 3 Red-shouldered Hawk nests were found on the Forests, in 8 historic nest areas. One active nest produced at least 1 fledgling Red-shouldered Hawk.

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.

Northern Goshawk

Evaluation and Conclusions:
With little direct monitoring capability (allocated funds or positions), we have observed no significant changes in populations, status, or area occupied by RFSS in 2007. The proposed Western Great Lakes Northern Goshawk Inventory and Monitoring project could allow annual surveys to determine variations in goshawk presence at 2 to 9 Primary Sampling Units across these Forests, depending on future funding available through the Regional Office.

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

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

Background: The Forests share habitat data with the Michigan Department of Natural Resource and the U.S. Fish & Wildlife Service. 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. Treatments include vegetative management to achieve or set the stage for desired conditions, creation of structures (water holes, nest boxes, etc.) used by RFSS, and protective actions, including closures to human uses that interfere with RFSS use. In FY2007, the Forests accomplished 7598 acres of ETS habitat treated, managed, protected, improved or restored (including 3,560 acres for Kirtland's Warbler; 3840 acres for Bald Eagle; and 196 acres for Karner Blue Butterfly, Dusted Skipper and Frosted Elfin), and 29,762 acres inventoried (including approximately 7,734 ac. for Northern Goshawk, Red-shouldered Hawk, and Spruce Grouse; 6,280 ac. for Bald Eagle; 2,334 ac. for Dusted Skipper and Michigan Bog Grasshopper; 840 ac. for Karner Blue Butterfly; 17,200 ac. for Kirtland's Warbler; 450 ac. for Black-backed Woodpecker; 170 ac. for Piping Plover; and 2 ac. for Eastern Pipistrelle). (Some acreages overlap, so sub-totals exceed total acres inventoried.)

Sensitive plant species (false boneset, prairie smoke, and Goldie's woodfern) were planted in an approximately 1 acre savanna restoration site at Loda Lake National Wildflower Sanctuary. Habitat improvements also benefit a fourth RFSS plant, ternate grapefern. At another location, encroaching invasive reed canary grass and other competing vegetation was removed within herbivory exclosure cages surrounding 2 groups of RFSS purple milkweed, . approximately .05 acre. Invasive St. Johnswort also was removed from 0.1 acre of RFSS prairie dropseed habitat.

RFSS Plants
Botrychium rugulosum
Ternate Grapefern

Agoseris glauca Pale Agoseris, False-Dandelion

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

Monitoring Item: **Endangered, Threatened, or Sensitive (ETS) Species Conservation Strategies**

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.

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

Forest Plan Desired Future Condition, DFC-9: 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 Indiana Bat, Karner Blue Butterfly, Kirtland's Warbler, Piping Plover and its Critical Habitat, Pitcher's Thistle, and Bald Eagle.

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), Strategy for Kirtland's Warbler Habitat Management in Michigan (Huber et al, 2001), and Kirtland's Warbler Census Protocol (Carlson & Huber 2005) guide management and monitoring. (See BO Monitoring Report for more detail).

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.

Bald Eagle The Bald Eagle Management Plan, Huron-Manistee National Forests (2006) and the Northern States Bald Eagle Recovery Plan (1983) guide management and monitoring.

Monitoring Activities:

Indiana Bat
Dr. Allen Kurta of the Department of Biology at Eastern Michigan University and a team of graduate students will 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 2008. This is a cooperative effort between Consumers Energy, Eastern Michigan University and the Forest Service. Recently, Dr. Kurta also has monitored bats in 21 locations in Manistee County, as part of environmental analysis for a proposed wind-energy project, and the Forests receive those encounter data.

Indiana Bat

Karner Blue Butterfly

Two Karner Blue Butterfly (KBB) Recovery Units (RUs) are identified on Manistee National Forest. The Muskegon RU includes the Otto and White River metapopulation areas, and Newaygo RU includes the Bigelow and Brohman metapopulation areas. Currently, we monitor 38 subpopulations in Otto, 21 subpopulations in White River, 6 subpopulations in Brohman, 3 subpopulations in Bigelow, and 7 other scattered subpopulations (3 in the Muskegon RU, and 4 within the Newaygo RU).

Karner Blue Butterflies

Surveyed areas were either treated between 1992 and 2003 to restore oak savanna or pine barrens habitats, or represent untreated reference sites. During first flight (May 21 to June 8), Baldwin-White Cloud Ranger District personnel conducted inventory surveys to identify new KBB subpopulations in the Otto, White River, Brohman, and Bigelow metapopulation areas. During second flight (July 8 to 27), District surveyors estimated KBB abundance via Distance sampling surveys or modified Pollard-Yates walks, and conducted habitat surveys within all known KBB subpopulations. Distance sampling surveys or modified Pollard-Yates walks were conducted at least twice for each subpopulation. Surveys to estimate KBB abundance and assess habitat conditions were conducted via a cooperative monitoring effort between the District and Michigan Department of Natural Resources. To examine the influence of weather on KBB over-wintering survivorship, the District collected hourly temperature and weekly snow depth data within 20 selected subpopulations. These data will be analyzed to evaluate the status of KBB metapopulation areas within the Manistee National Forest; to develop a habitat suitability model for KBB within the Manistee National Forest; to identify high priority areas to target management; and to evaluate the effectiveness of different treatments for restoring savanna/barrens and KBB habitat.

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."

Kirtland's Warbler (Ron Austing photo)

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 NFSL**

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).

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 (2006) and the Northern States Bald Eagle Recovery

Plan (1983), some 89 historically-known nest locations were surveyed by air and/or ground.

Evaluation and Conclusions: Conservation Strategies and Recovery Plans are in place and followed for the 5 Endangered and Threatened species and Critical Habitat 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.

Seasonal Piping Plover monitoring personnel (temporaries, seasonals, interns, volunteers, etc.) should be trained and oriented to critical habitat no later than 15 April if possible, to allow daily monitoring if a nest is discovered during the field season. In addition to primary habitat areas, occasional monitoring of secondary habitat and potential nesting areas behind fore-dunes should continue, although lack of suitable water sources in these areas makes these areas to support nesting birds.

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 that require monitoring include trampling by humans, browsing by rabbits and deer, and damage by insects.

Monitoring Item: **Endangered, Threatened, or Sensitive (ETS) 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.

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

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

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

Monitoring Background:
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
Baldwin-White Cloud Ranger District personnel conducted inventory surveys on 308 acres to identify new KBB subpopulations in the Otto, White River, Brohman, and Bigelow metapopulation areas. New KBB subpopulations also were identified by coordinating monitoring activities with the Michigan Department of Natural Resources and Grand Valley State University. As a result, 27 new Karner blue butterfly subpopulations were identified and monitored within the District. During second flight (July 8 to 27), District personnel, in cooperation with Michigan Department of Natural Resources, estimated KBB abundance and assessed habitat conditions within 75 KBB subpopulations covering 535 acres. Distance sampling surveys or modified Pollard-Yates walks were conducted at least twice for each subpopulation to estimate KBB abundance. Habitat surveys were conducted within all 75 subpopulations, while hourly temperature and weekly snow depth data were collected within 20 selected subpopulations.

Since 1992, handcutting, prescribed burns, mowing, scarification, and seeding have been used to manage 633 acres of occupied and 234 acres of unoccupied Karner blue butterfly habitat within the Muskegon and Newaygo RUs. In spring 2007, prescribed burns took place on 3 acres of occupied and 126 acres of unoccupied Karner blue butterfly habitat within the Otto metapopulation area. Burned areas had been logged to savanna density in 1998 and 1999 and burned in the spring of 2004. Only small woody stems were killed in the 2004 and 2007 spring burns. Bracken fern increased and forbs decreased within these areas following both burns. In addition, the Baldwin-White Cloud Ranger District also closed and obliterated 1 mile of road, restricting access to a campsite located within an occupied KBB subpopulation in the White River metapopulation area. The road closure has reduced adverse impacts from recreational uses within 40 acres of KBB habitat. Thirteen acres of road widening also was conducted to improve a road corridor that promotes dispersal between several occupied KBB subpopulations in the Otto metapopulation area.

Kirtland's Warbler
The Kirtland's warbler census has been conducted annually since the 1971, making 2007 the 38th consecutive year the census has been conducted. The 1971 census 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. To cover the estimated 17,200 acres on the Huron National Forest and 1,400 acres on the Au Sable State Forest, employees from the Forest Service, Fish and Wildlife Service, and MDNR are needed. Most importantly, 20 volunteers provided 300

hours (approximately $9,000 value) of time and expertise critical to accomplishing this task.

Kirtland Warbler Surveyor

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. Only one plover, and no nests or evidence of breeding, were found in Critical Habitat areas on Manistee National Forest Service lands in 2007. 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).

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. "Closures" of occupied bald eagle territories to human intrusion are ordered each year by the Forest Supervisor, posted by Districts, and enforced by Forest Law Enforcement Officers and Forest Protection Officers.

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.

Karner Blue Butterfly
Baldwin-White Cloud Ranger District personnel surveyed 234 more acres for KBB in 2007 than in 2006. This increase in effort was possible because of the Forest's KBB Monitoring Outreach Program, which encourages citizens to actively participate in KBB surveys. In 2007, volunteers from numerous private and public partner organizations such as Michigan State University, Ferris State University, Grand Valley State University, Michigan Entomological Society, Michigan Federated Garden Clubs, Michigan's Conservation Districts, Land Conservancy of West Michigan, and Little River Band of Ottawa Indians provided 123 volunteer days (~$17,000 in contributed volunteer time).

Kirtland's Warbler
In 2007, 1,697 singing males were counted in Michigan, the highest count ever recorded (Table 21). This is the seventh time since 2001 that the number of singing males counted on a census exceeded 1000. The 2007 count was 15 percent higher than the 1479 singing males counted in 2006. (See Table 21, below.)

Table 21. FY 2007 Kirtland's Warbler Census Results, Singing Males						
Census Area	**FY2005**		**FY2006**		**FY2007**	
Eldorado KWMA	35		37		28	
Big Creek KWMA	105		49		47	
Mack Lake KWMA	41		27		47	
McKinley KWMA	33		35		43	
Pine River KWMA	244		304		370	
Tawas KWMA	0		10		19	
Luzerne Blowdown	0		0		0	
Hagaman Burn	0		0		0	
Total	458		462		554	
Habitat Type	**FY2005**		**FY2006**		**FY2007**	
Plantation	424	92.6%	429	92.9%	490	88.4%
Wildfires	0	0.0%				
Natural Regeneration	34	7.4%	33	7.1%	58	10.5%
Total	458		462		554	

Management Objective: HMNF = 420 of 1000			
Lower Peninsula Total	1399	1458	1665
Upper Peninsula Total	18	21	32
Michigan Total	1417	1479	1697

Huron National Forest census efforts located 554 singing male Kirtland's warblers on National Forest System land (NFSL) in 2007, the highest number ever documented. This is thirty-three percent (33%) of the total singing male Kirtland's warbler population, slightly higher than in 2006 (31%). The 554-male count is thirty-two percent (32%) higher than the Forest's goal of producing a minimum of 420 individuals from nesting habitat on NFSL. The Forest exceeded its goal once in 1995 as a result of the Mack Lake Burn, and then every year since 2003. The success of the past five years can be attributed to the Forest's efforts to create jack pine plantation habitat.

From 2006 to 2007, the count on the Huron National Forest increased by 92 singing males (20%), from 462 to 554. Acres of occupied habitat increased from 8887 in 2006 to 9947 in 2007 (+12%). No occupied habitat was affected by wildfire in 2007.

Piping Plover

Piping Plover Critical Habitat on Cadillac-Manistee Ranger District was monitored in 2007 by 21 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 23 and July 25. 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 2007, 63 breeding pairs of plovers were observed in the Great Lakes area, and fledged 125 young (an average of 1.98 fledglings per nest). In addition, 12 captive-reared birds were successfully released, bringing total fledged birds for 2007 to 137 (Dingledine et al, 2007). Plovers were sighted on HMNF NFSL on only 1 occasion during 2007, and no plover nests were discovered on NFSL during monitoring surveys.

Bald Eagle
The 256 active nests counted in the Northern Lower Peninsula in 2007 are a marked increase from 80 pairs, over 30 years ago. Of 89 historic territories in or near the Forests, 72 were active in 2007, up from 15 in 1986. In 2007, 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, Forest-wide, was 1.50 young per nest.

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.

Evaluation and Conclusions: Karner Blue Butterfly: Fifty-three of the 75 Karner blue butterfly subpopulations monitored were occupied. Baldwin-White Cloud Ranger District and Michigan Department of Natural Resources personnel and volunteers observed 2,822 KBB within these 53 subpopulations, giving us an estimated minimum KBB abundance of 25,084 within the Manistee National Forest. Estimated KBB abundance was between 6,785 and 9,487 within the Otto metapopulation area; between 2,188 and 3,052 within the White River metapopulation area; between 7,617 and 10,663 within the Bigelow metapopulation area; and 0 within the Brohman metapopulation area.

Quantitative data on KBB numbers were recorded for 29 monitored sites in 2005 and 2006, and for 51 sites monitored in 2006 and 2007. The counts from 2006 were significantly lower than those from 2005 with alpha set at 0.10 ($df = 28$, $t = 1.75$, $p = 0.09$), while counts from 2006 and 2007 were not significantly different ($df = 50$, $t = -0.91$, $p = 0.37$). Thus, KBB numbers appear to have decreased between 2005 and 2006, but remained stable between 2006 and 2007.

Since 1997, Baldwin-White Cloud Ranger District personnel have collected presence/absence data for 55 sites. The graphs below illustrate how the number of sites designated as 'KBB present' and 'KBB absent' has changed over time. Caution is required when interpreting these data, given that data are missing for sites in some years,

and a standardized monitoring methodology did not begin until 2005. Overall, the percentage of sites designated as 'KBB present' has declined since 1997.

Figure 4. Long-term Trend for Karner Blue Butterfly.

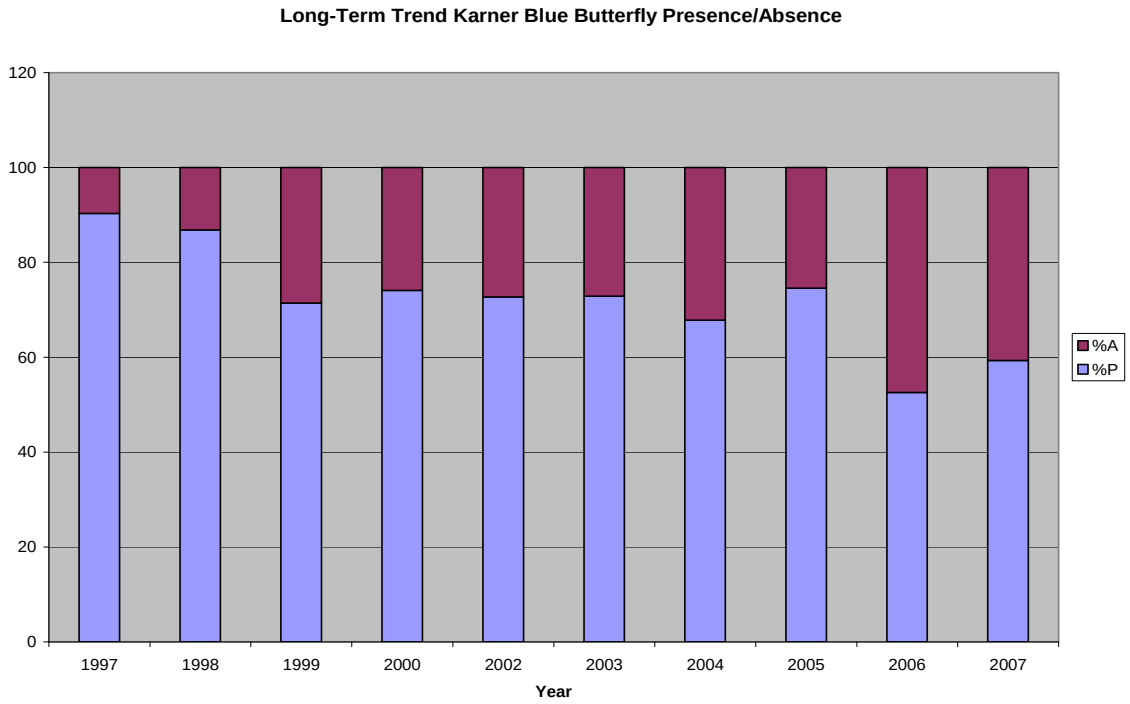
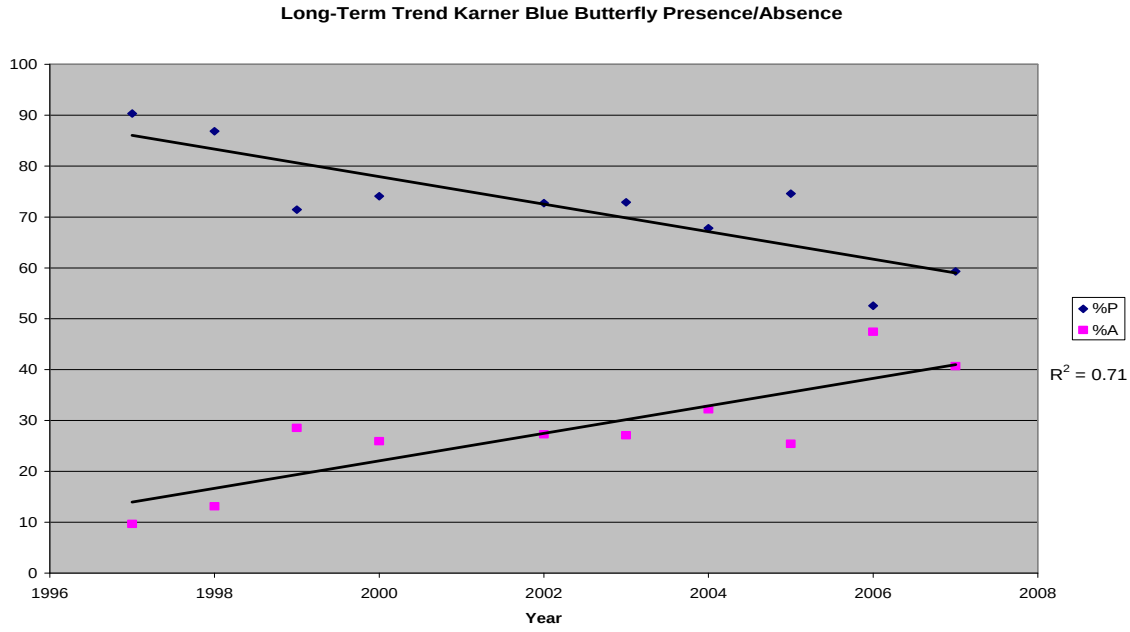


Figure 5. Long-term Trend for Karner Blue Butterfly.



Trends in Threats to the Species
Threat A) Habitat loss/modification/destruction/ Succession -- These most common threats to KBB in the Otto, White River, Brohman, and Bigelow metapopulation areas appear to be increasing. Succession was listed as a threat for 59% of the monitored subpopulations, and competition with Pennsylvania sedge or non-native invasive species was listed as a threat for 35% of monitored subpopulations. Past treatments have attempted to manage this threat, and we plan to implement several different treatments to determine their 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 was listed as a threat for 39% of the monitored KBB subpopulations. The threat is probably declining due to road closures and their enforcement. Environmental Assessments are underway to propose additional road closures to protect KBB habitat.

Threat C) Other natural or manmade factors affecting its continued existence – Drought led to the early senescence of wild lupine and other important KBB nectar plants during second flight in 2007. In addition, deer browsing of wild lupine was frequently noted within subpopulations throughout the summer. These two factors may have reduced the availability of nectar sources for KBB larvae and adults, reducing productivity; and in the case of deer browsing, may have led to direct mortality of KBB.

None of the four metapopulation areas within the Huron-Manistee National Forests currently meet Karner Blue Butterfly Recovery Plan (USFWS 2003) criteria for minimum or large viable metapopulations. Past management efforts within these metapopulation areas have focused on maintaining/creating subhabitats required by adult KBB within recently occupied sites, and increasing connectivity between such sites. Current management practices focus on using an adaptive, landscape management approach to maintain/create a heterogeneous mosaic of subhabitats required by all life stages of KBB that promotes dispersal and persistent metapopulations.

Kirtland's Warbler
Approximately 88,300 acres are designated as Kirtland's Warbler "Essential" habitat in the 2006 Forest Plan, 8,500 acres more than the 79,800 acres previously determined necessary to sustain the Forests' goal of 420 pairs. "Essential" habitat is defined as "that land identified as biologically appropriate and necessary for the development of nesting habitat for Kirtland's warbler." As a result of a 2007 project decision to plan fuel break construction within "Essential" habitat, "Essential" habitat was reduced by 35 acres, to approximately 88,213 acres.

In 2007, approximately 9947 acres of habitat were occupied by Kirtland's Warbler on the Huron National Forest. It is estimated that approximately 16,000 acres would be available to Kirtland's Warbler if the Forests were harvesting and planting 1,600 acres of jack pine each year (1,600 acres x 10 years of occupancy). Despite the current shortfall

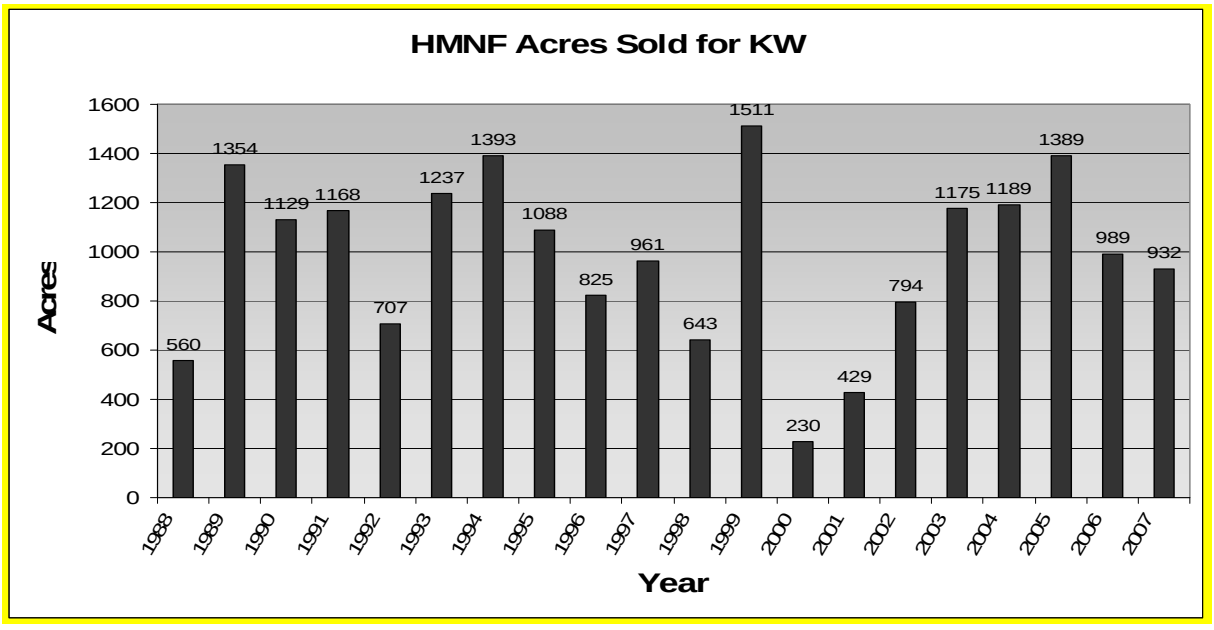
of habitat, 554 singing males were counted on the Huron National Forest in 2007. This is approximately 32% higher than the minimum objective of 420 singing males.

The 2006 Forest Plan increased the average annual harvest and reforestation level to 1,600 acres per year. This is substantially higher than the 1,070 acre per year target in the 1986 Forest Plan. In addition, the 2006 Forest Plan increased maximum treatment block size from 370 to 550 acres. If implemented, both changes would have substantial benefits to Kirtland's warbler, and to the ability of Huron-Manistee National Forests to meet or exceed the goal of providing occupiable habitat for a minimum of 420 pairs of Kirtland's Warblers.

However, the Forest Leadership Team has decided to limit annual habitat development to approximately 1,200 acres per year for the near future, due to budget and personnel constraints on the Forests' ability to sell additional timber. Leadership's goal is to increase annual outputs slowly over the next several years, to eventually meet the goal of providing a sustained 1,600 acres per year. However, a serious downturn in jack pine markets for has made it difficult to sell jack pine timber sales, and subsequently to plant jack pine to create Kirtland's warbler breeding habitat.

In 2007, the Forests sold 633 acres of jack pine, and cut an additional 299 acres of immature jack pine by noncommercial treatment. The Forests attempted to sell a 231-acre block in the Eldorado Kirtland's Warbler Management Area, but the sale received no bids. The 932 acres sold this year is significantly below the Forest Plan's annual objective of 1,600 acres per year. An average of 1,266 acres has been offered for sale over the past five years. In 2008, the Forests will attempt to increase the jack pine timber offered to 1,414 acres.

Figure 6. Acres of Huron-Manistee National Forests Timber Sold for Kirtland's Warbler Management.



Once treatment blocks have been harvested, they are planted to jack pine. An average of 1,156 acres has been regenerated for Kirtland's Warbler over the past five years, through development of plantation habitat. In 2007, 864 acres of "Essential" habitat were planted, a little more than half the current annual objective of 1,600 acres per year. Included in these acres is a 231-acre plantation that had been occupied the year prior to the 2006 Hughes Lake Fire. Not included in these acres is the 588-acre Galion Road Fire that burned July 29, 2007 in Iosco County. A preliminary assessment indicates this area will not naturally regenerate to stocking levels required by Kirtland's Warbler.

In the 2006 Monitoring report, it was estimated that approximately 2,000 acres of "Essential" habitat would regenerate naturally as a result of the Hughes Lake Fire that burned through the Big Creek Kirtland's Warbler Management Area on April 30, 2006. In summer 2007, we found that few areas within the burn have adequate stocking of jack pine to create future breeding habitat for Kirtland's Warbler. Therefore, our original estimate of natural habitat resulting from the Fire has dropped considerably. A more accurate assessment will likely be available once stocking surveys have been completed.

In 2007, an old Air Force bombing and gunnery range was discovered in Pine River KWMA. As a result, most of the Kokosing KW block (210 acres) was not reforested, due to unexploded ordinance (UXO) found on the planting site. Reforestation of this block is uncertain pending UXO surveys by the Department of Defense. This issue may affect our ability to manage or survey more of Pine River KWMA in the future.

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.

Table 22. Human Intrusion of Piping Plover Habitat.

Fiscal Year	People	Dogs		
		Leashed	Unleashed	Tickets Issued
2003	*n/a	*n/a	*n/a	*n/a
2004	*n/a	*n/a	*n/a	1
2005	255	9	3	3
2006	319	19	16	0
2007	232	28	21	0

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 should continue 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. It is important that the Pitcher's Thistle monitoring project continues over time, at least every 5 years, to monitor population trends, habitat changes, and effects of potential threats to the species and populations here.

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.

Recommendations: Continue monitoring Lombardy poplar, spotted knapweed and other NNIS along the shoreline, to determine if they are competing adversely with Pitcher's Thistle.
- Continue monitoring Pitcher's Thistle populations, at least every 5 years, with

additional monitoring in subsequent years, if needed.
- Focus monitoring on potential threats to the population, specifically NNIS locations, recreation use (foot traffic), browsing, and presence and effects of insects or other pests.
- Improve visitor education, to interpret the ecological value of Pitcher's Thistle and fragile dune ecosystems.

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): Forest Plan Goal, G-H&S-6: 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.

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

Forest Plan Goal, G-NR-10: 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.

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

Forest Plan Desired Future Condition, DFC-7; 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.

Prescribed fire was used on the Mio Ranger District, Huron National Forest, for the purpose of maintaining or creating savannahs, prairies, and dry grasslands, Table 21.

Table 23. Acres of Fire-adapted Landtype Associations Treated with Prescribed Fire in FY2007.	
Location/Purpose	**Acres**
Loli - Dry Grasslands	91
Mio	25
Deckerville Rd – Dry Grasslands	13
Au Sable Barrens (oak-pine barrens)	40
Au Sable Barrens (jack pine old growth)	302

Prescribed Burn

Evaluation and Conclusions: The Forests are pursuing opportunities to restore savannas, prairies, dry and mesic grasslands, shrub-scrub, and oak-pine barrens, particularly in conjunction with managing habitat for Endangered Karner blue butterfly and Kirtland's warbler.

The Mio - Valley Road dry sand prairie prescribed burn is improving habitat for Regional

Forester's Sensitive Species including pale agoseris (false-dandelion) (*Agoseris glauca*), Hill's thistle (*Cirsium hillii*) and rough fescue (*Festuca altaica*).

A total of 489 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.

While short of the 2006 Forest Plan goal of restoring or maintaining 10,000 acres of prairies, savannahs, and oak-pine barrens within old growth areas, the Au Sable Barrens burn is maintaining approximately 40 acres of oak-pine barrens occurring in old growth.

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

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

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

Background: **T**ransmission lines owned by Consumer's Energy and Wolverine Power cross Forest Service lands within easements managed by those companies. 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.

Cooperative Wildlife Habitat Treatment plot near Newaygo (9/20/07)

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.

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.

Monitoring Item: **Fish and Wildlife Population Objectives — General**

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): Forest Plan Goal, G-NR-12: 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.

Forest Plan Goal, G-NR-13: 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. The Forests share habitat data with MDNR and USFWS. Site-specific prescriptions for RFSS are implemented, when they occur within project areas.

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. They also 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 other Federal and State agencies to achieve shared wildlife and fish population objectives.

Monitoring Item: **Fire Management – Safety**

Monitoring Question: What activities have been done to promote safe fire prevention and fire suppression?

Mo**nitoring Driver(s)**: Forest Plan Goal, G-H&S-3: 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 conifer fuel types every five years, due in large part to having one of the largest contiguous areas of jack pine in the United States. This particularly volatile fuel type occurs on dry sandy soils and generates very high fire danger in April and May before deciduous foliage greens up. Typically occurring in the spring is a phenomenon called a Hudson Bay High which contributes to the high fire potential. A large area of cool, dry air builds up west and southwest of Hudson Bay, including Michigan. The resultant air mass stalls over the region and produces many consecutive days of dry weather, drying out the previous season's fine fuels. The temperature increases and the stage is set for a fire event.

Smaller fires are fairly common on the Forests and require an organized and immediate response to minimize their severity. Safety of employees and the 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. Programs such as Firesafe are provided to the public at special events to promote involvement in practices that reduce fire risk around homes and cabins.

Monitoring Activities: Line officer fire reviews were accomplished on more than 10 percent of fires on the Forests. The 598 acre Galion Road Fire on the Huron Shores District was reviewed by the District Ranger and Deputy Forest Fire Management Officer. The Forests' fire personnel also participated in a local fire review by Fire Departments and the County Dispatch Center. In 2007, the Forests had 102 fires that received a Forest Service response.

Home damaged by wild fire, but saved by firefighters

Prescribed burn plans and project implementation were also reviewed by line officers and fire staff. Line officer participation in after action discussions was also accomplished for safety concerns and rating to determine how well objectives were achieved.

Prescribed fire burn planning is thorough, with multiple level reviews. National, Regional and Forest direction for burn plan format and content are done 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.

Evaluations and Conclusions: The Forests are very strong in promoting safe practices in fire suppression, fuels management, and fire prevention. From the Forests' leadership to on-the-ground firefighters, their main emphasis is on 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 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.

Forest Plan Goal, H&S-1: 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.

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

Forest Plan Goal, G-H&S-3: 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 (Forest Service corporate computer database) 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. Rehabilitation of ground disturbing activities done during suppression is completed on all fire areas recommended by resource advisors.

Monitoring Activities: In 2007, 102 fires on the Forests burned 950 acres. The Galion Road Fire of July 29, 2007 burned 589 acres. Fuel reduction activities on lands adjacent to this fire helped in saving structures and the suppression of this fire. Appropriate management response in suppression of fires include using natural fuel breaks for control lines, wet line, or hand line in place of dozer plow line, and the use of aviation resources. Fire fighter and public safety are always the first consideration of the fire suppression response.

Hazardous fuel reduction was accomplished on 4,804 acres of National Forest land. This resulted in directly improving condition class on these acres. These areas were broadcast burned, had mechanical fuel reduction activity, or had other vegetation management which lessened the wildfire risk. Project areas were monitored after activity completion to confirm the reduction in fuel loading and fire hazard risk. In addition, another 3,850 acres were treated by vegetation management practices, such as conifer harvest for

Kirtland Warbler habitat, wildlife opening maintenance, and timber harvesting. These activities also contributed to improved condition class for these stands.

Annual Preparedness reviews are conducted on the Forests by fire staff and line officers. These include a review of prevention, presuppression, and suppression activities on the Districts.

Evaluations and Conclusions: Condition class change was accomplished on these project areas moving 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 ecosystems are functioning within their historical range.

Annual Preparedness reviews show that District personnel are performing at a satisfactory or better level in their fire management programs. Concerns are addressed and corrected in a timely manner.

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.

Forest Plan Goal, H&S-7: 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 with 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. These areas are identified in the NEPA process for treatment.

Monitoring Activities: Hazard rating reduction takes place through vegetation management fuels treatments. In FY2007 the Forest accomplished activities on 8,654 acres that lowered fire hazard rating. Monitoring through contract administration, and line officer involvement ensure objectives are being met. Prescribed burning, timber sales, mechanical treatments, and other vegetation management have combined to reduced wildfire hazard on the Forest and lessen the risk to Forest employees and public.

Vegetation Management projects that reduced fire hazard are entered into the FACTS database.

Evaluations and Conclusions: The Forests are not measuring hazard ratings, per se, though fuel hazard reduction activities are making a difference. During the Galion Road Fire, the fire burned up against areas that the Forests had treated to reduce hazardous fuels in recent years. The extreme fire behavior was changed to lower fire intensity that allowed Forest and Cooperator fire suppression resources to safely work on the fire edge.

Green trees remain after Galion crown fire (7-29-2008) burned into a fuelbreak and became a ground fire.

Monitoring Item: **Heritage Resources – Accomplishments**

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

Statutory authorities; principally Sections 106 and 110 of the National Historic Preservation Act (NHPA).

Monitoring Question(s): How many archaeological and historic studies were initiated and completed? How the information was 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 materials 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.

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.

Monitoring Activities: In meeting the mandates of Section 106 of the NHPA, the Forests' conducted approximately,

- 121 literature searches and field survey projects,
- 5,434 acres newly surveyed,
- 110 new or previously recorded heritage properties were encountered during the Forests' inventory, and
- 55 sites and three projects received condition monitoring work.

Information and recommendations resulting from this activity were incorporated into NEPA 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. In addition, a volunteer devoted 114 hours, valued at $1,400, helping the Forests achieve their survey requirements.

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 2007 Section 110 work include the award of a contract to conduct a historic resources study of the Chittenden Nursery and Wellston Guard Station. The objectives of the study were to produce an historical context and administrative history for the facilities including condition assessments and National Register of Historic Places nominations. The study will be completed by June 2008.

Also in FY2007, historical information was researched and interpretive panels designed and produced with the help of archeologist Laura Louks and other Forest personnel for the Loda Lake Wildflower Sanctuary. Documentary research was begun for interpretive signage for the Udell Lookout Tower site with funding provided by the Eastern National Forests Interpretive Association. Other Section 110 projects included several heritage management orientation sessions for a number of Forest employees.

Evaluation: The Forests are meeting Forest Plan direction for heritage resources in respect to NHPA Section 106 requirements. Coordination of resource protection needs during project design and implementation continues as a priority. Primary emphases include initiation of the process for curation of the Forests' archeological collections and to complete the corporate database FY2008 mandate.

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.

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

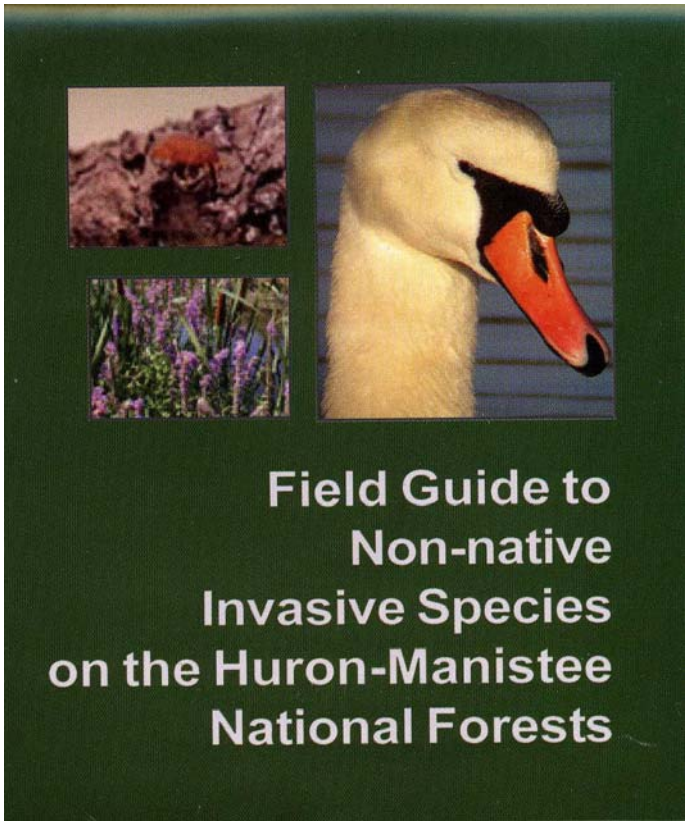
Background: Non-Native Invasive Species are plant and animal species which are not indigenous to the northern Lower Peninsula of Michigan, which aggressively compete for space and resources with native species. An organism is considered non-native when it has been introduced by humans to a location outside 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 Species plant list for the Forests. Sixty plants are listed as Non-Native Invasive Species of concern for the Forests, including plants not yet found on the Forests, but likely to arrive in the near future. 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 is 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 NNIS of major concern has also being developed, expanded to include animal NNIS (vertebrates, insects, etc.) in 2007.

NNIS PowerPoint Presentation

NNIS Field Guide



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.

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

Monitoring Question: What percent of NNIS sites and acres have been treated, and how effective was the treatment?

Monitoring Driver(s): Table IV-3, Categories 2, 3, & 4, 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.

Forest Plan Goal, G-NR-6: Reduce Non-Native Invasive Species infestations and prevent new invasive species from becoming established, when possible.

Huron-Manistee National Forests NNIS Removal Crew in Pitcher's Thistle Habitat

Monitoring Activities: Non-Native Invasive plant control was achieved on 159 acres in FY2007. 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 NNIS populations in a grouse management area, and in administrative or recreation sites.

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 presently are not 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.

Evaluation and Conclusions: Forests will continue to increase the intensity of noxious weeds surveys. Continue to explore methods of noxious weed control with emphasis on biological controls. Use of herbicides should be considered to effectively control noxious weeds. Continue to participate and cooperate with Forest staff, other agencies, and the private sector to inform them of Non-Native Invasive plant concerns and control opportunities. Seek support and funding for a noxious weed program that effectively decreases noxious weed populations, and protects and maintains native species and sensitive habitats.

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.

Forest Plan Goal, G-NR-6: 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 ORV trails would require staffing to survey at least parts of the 1,796 miles of trails and 2,900 miles of roads on the Forests. Approximately 640 miles of trails are open to snowmobile use in season; 596 miles of designated motorized trails are open to all-terrain/off-road vehicle use; 180 miles of trails are open to hiking, supplemented in season by 160 miles used for horse-riding or hiking, and 140 miles designated for cross-country skiing or hiking; 80 miles of trails are used for mountain-biking, cross-country skiing, or hiking – each with different risks from NNIS. Rate of spread could be quantified as the change in percentage of roads or trails infested from year to year, or the change in miles of roads or 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: The Forests' 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: This monitoring is a high priority, but accomplishment will depend on adequate Botanical staffing, and training of all Forest personnel to recognize and report NNIS. Management and treatment of NNIS discovered in these high-likelihood locations will also depend on adequate staffing, and judicious use of appropriate herbicides. OHV-user education through signage and brochures may help, as would equipment cleaning stations at strategic locations.

Monitoring Item: **Minerals**

Monitoring Question: Are lease stipulations and permit conditions ensuring sound environmental protection and resource utilization?

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

Forest Plan Goal, G-NR-20: 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.

Forest Plan Goal, G-NR-21: 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 FY2007, the HMNF 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 HMNF incorporated mandatory regulatory requirements regarding mineral availability decisions into the Revised Forest Plan (March 2006). In FY2007, the Forest identified approximately 17,200 acres of federal

mineral ownership as available for federal leasing. This acreage was subsequently offered for competitive leasing by the BLM. The State of Michigan requests the Forests' recommendations on lease stipulations when leasing State minerals under National Forest System (NFS) lands. The HMNF identifies which State lease stipulations are applicable and ensures comparable protection to that found when leasing federal mineral estate. In FY2007, we reviewed approximately 1,200 acres of NFS lands to identify necessary lease stipulations on lands with 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.

Evaluations 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 BLM) 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.

The Forests will continue to monitor mineral leasing and development activities on National Forest System lands. This includes on-site inspections and monitoring of the level of new oil and gas development following completion of Plan Revision.

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? Are trails and roads being maintained to safe standards?

Monitoring Driver(s): Forest Plan Goal, G-NR-30: 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.

Forest Plan Goal, G-NR-31: 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. The Travel Management Rule (2006) provides expectations for OHV travel access management on the National Forests. The intent of the Rule is to provided regulation of OHVs as a result of the tremendous increases in the number and power of OHVs; widespread environmental and social impacts from unmanaged recreation; while recognizing that motorized recreation is a legitimate use of National Forest system lands in the right places. 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 are being developed for the Forests 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 National Forests will be publishing a map for each of the four Ranger Districts, including Huron-Shores and Mio (Huron National Forest) and Baldwin-White Cloud and Cadillac-Manistee (Manistee National Forest).

Huron-Shores and Mio Ranger Districts on the Huron National Forest published their map in March 2008. Baldwin-White Cloud and Cadillac-Manistee on the Manistee National Forest will publish their maps in March 2009.

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.

Table 24. Motor Vehicle Use

Ranger District	National Forest System (NFS) Acres	Projected Date For Publication of - Motor Vehicle Use Map Published	Existing NFS Roads Open To Motor Vehicle Use	Existing NFS Trails Open To Motor Vehicle Use less than 50 inches	Existing NFS Trails Open To Motorcycle only	Existing NFS Trial and Routes open to Snowmobile from Nov 15 to March 15	Acres in Areas Designated open for motor vehicle (Bull Gap Hill Climb)
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

Table 25. Motorized Recreational Opportunities on Huron-Manistee National Forests

ACTIVITY	AVAILABLE
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: **Recreation Opportunity Spectrum (ROS) and Dispersed Recreation**

Monitoring Question(s): Are the recreational opportunities provided compatible with ROS objectives?

Monitoring Driver(s): Forest Plan Desired Future Condition: DFC-2: Recreation management provided is compatible with the Recreation Opportunity Spectrum objectives.

Evaluations and Conclusions: When signed, the 2006 Forest Plan received changes to acres in Recreation Opportunity Spectrum classes. There was no increase in congressionally designated Wilderness. Semiprimitive classified acres increased after analysis and public involvement. Roaded Natural classified acres decreased. Rural classified acres increased due to population migration and development on private lands. Urban classification is not usually found on National Forest System lands.

Table 26. Forests Acres[1/] by Recreation Opportunity Spectrum Class.

Recreation Opportunity Spectrum Classification	2006 Forest Plan Alternative A (1986 Forest Plan as amended)		2006 Forest Plan Alternative B (Preferred)	
	Acres	Percent of Forests	Acres	Percent of Forests
Primitive or Designated Wilderness	3,370	0.35%	3,370	0.35%
Semiprimitive nonmotorized	59,626	6.11%	62,301	6.40%
Semiprimitive motorized	11,375	1.17%	17,149	1.76%
Roaded natural[2/]	813,800	83.35%	715,409	73.52%
Rural	49,710	5.09%	128,483	13.20%
Variable/Special Designations	38,528	3.95%	46,385	4.77%
Urban	0	0.00%	0	0.00%

[1/]Acres from Corporate Data System (CDS), Huron-Manistee National Forests, 2002. [2/] Includes Kirtland's Warbler Habitat.

ACTIVITY	AVAILABLE Recreation Opportunity on Huron-Manistee National Forests
Foot travel activities including: 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. Activities are seasonally prohibited in threatened or endangered species habitat during nesting.
Hunting And gathering activities	Approximately 970,000 acres open to hunting (must have state license and/or federal permit). Activities are prohibited in developed recreation areas app. 2,230 acres, administrative sites app. 700 acres, 450 feet from all structures public or private, not allowed on roads and trails, and seasonally in threatened or endangered species habitat during nesting.
Non-motorized Canoe Kayak, tubing, etc.	1,800 miles of rivers and 17,000 acres of lake (two W& S Rivers require watercraft permit). Activities are prohibited on parts of some lakes seasonally in threatened or endangered species habitat during nesting.
Fishing	1,800 miles of rivers and 17,000 acres of lake (Require state fishing license). Activities are prohibited on some parts of lakes and rivers seasonally in threatened or endangered species habitat during nesting.
Trails both nonmotorized and motorized are part of dispersed recreation.	