United States Department of Agriculture

Forest Service

2012/2013 Monitoring Report

Huron-Manistee National Forests

Lumbermen's Monument

Approval

I reviewed the FY 2012-FY 2013 Monitoring and Evaluation Report for the Huron-Manistee National Forests. The 2006 Forest Plan was implemented on June 26, 2006. This Monitoring and 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:

_____ _____

Date

Leslie M. Auriemmo, Forest Supervisor

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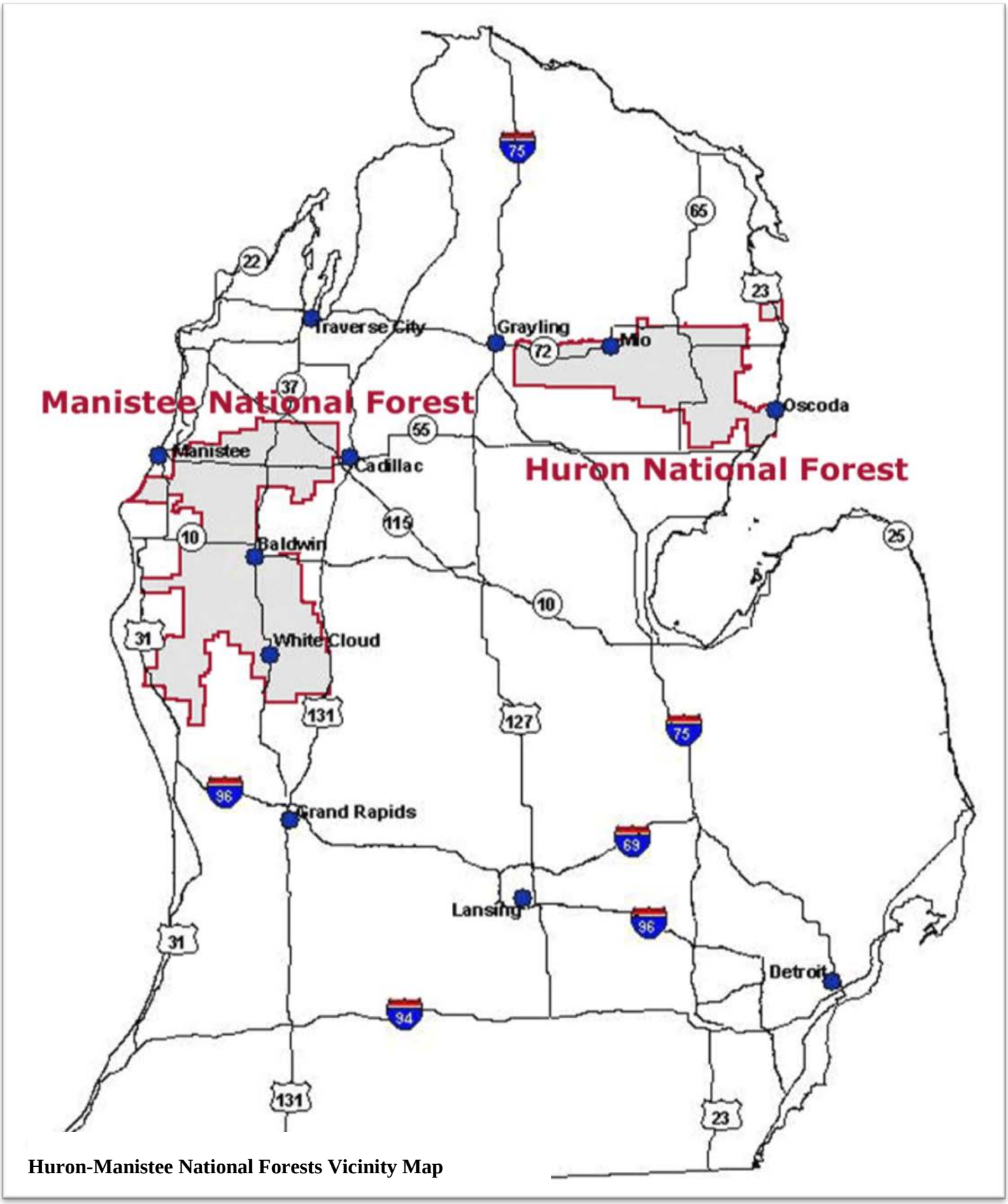

Huron-Manistee National Forests Vicinity Map

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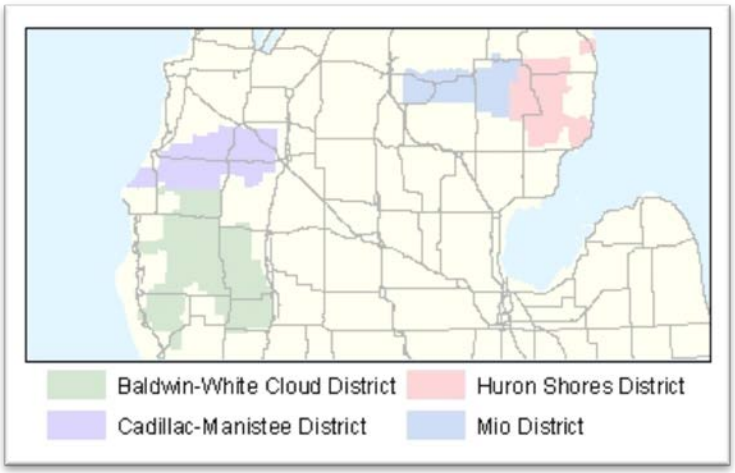


Ranger Districts on the Huron-Manistee National Forests

INTRODUCTION

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.

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 2006 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 information gained from the Monitoring and Evaluation Report is an indicator of how well the goals, objectives, and desired future conditions of the 2006 Forest Plan have been met. Implementation of the 2006 Forest Plan, at this juncture, is showing some trends, patterns, and results. Patterns and conclusions leading to changes in the Forest Plan are identified in this report. However, the Monitoring Report is not a decision document, but includes information that will be used to inform decisions.

The Monitoring and 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 the 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 sixth-seventh (combining two years) Monitoring and Evaluation Report (M&E) compiled under the 2006 Huron-Manistee National Forests Forest Plan. This M&E Report combines fiscal years 2012 and 2013 and provides an evaluation of the 2006 Forest Plan since implementation. The M&E Report provides an opportunity to track progress toward 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. Information gained from the M&E Report is used to determine how well desired conditions, goals, objectives, and outcomes of the Forest Plan have been met.

Monitoring and evaluation is described in Chapter IV of the 2006 Forest Plan and describes methods the Forests will use in measuring predicted outputs. The Forest Plan's Monitoring Plan identifies information needed to make this determination, and guides our monitoring with broad questions to be answered.

The following sections summarize results from the FY 2012-2013 monitoring items. Each resource area includes the monitoring question(s) with findings, evaluations, and conclusions.

The aim of monitoring is adaptive management, which is responding to current conditions or making appropriate changes based on new information or technology. As a result, the 2006 Forest Plan may be amended or revised to adapt to 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 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 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 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.

Administrative Changes to the 2006 Forest Plan

Administrative changes to the Forest Plan are defined at 36 CFR 219.31(b) in the 2012 Planning Rule and may be made at any time. An administrative change is any change to a plan that is not a plan amendment or plan revision. Administrative changes include changes of clerical errors to any part of the plan, conformance of the plan to new statutory or regulatory requirements, or changes to other content in the plan (§ 219.7(f)). (1) A substantive change to the monitoring program made outside of the process for plan revision or amendment may be made only after notice to the public of the intended change and consideration of public comment (§ 219.16(c)(6)). (2) All other administrative changes may be made following public notice (§ 219.16(c)(6)).

There were two administrative changes to the 2006 Forest Plan in 2013. Administrative change #6 replaced Figure D-1, page D-2, Appendix D. The action corrected a typographic error in the projected long-term sustained yield (LTSY). Administrative change #7 replaced Tables D-2 and D-3, pages D-2 and D-3, Appendix D. The action corrected typographic errors in the projected cubic feet timber volume.

All administrative changes can be found at the Huron-Manistee National Forests web site: http://www.fs.usda.gov/main/hmnf/landmanagement/planning**.**

Additional administrative changes are likely in the future. These will be available on the website above and we encourage use of this resource for accessing the most up to date information on administrative changes. Future administrative changes will also be listed in the Huron-Manistee National Forests' Monitoring & Evaluation Report. However, the Forests will not be mailing individual notices as further administrative changes are issued. The administrative changes process will not change how we conduct environmental analyses for site-specific projects. We will continue to provide opportunities for public involvement as we plan various specific projects implementing the Forest Plan, or if we propose any substantive changes to the Forest Plan.

2006 Forest Plan

The Huron-Manistee National Forests Forest Plan was revised in 2006 after the Forest Service prepared a final environmental impact statement (2006 FEIS) under the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 et seq. The 2006 Forest Plan was approved by the Regional Forester on March 20, 2006 and the new management direction was implemented in the Huron-Manistee National Forests.

The approval of the 2006 FEIS and the 2006 Forest Plan were administratively appealed. After the administrative appeal was denied, a lawsuit was filed in the U.S. District Court for the Eastern District of Michigan (Chief Judge Gerald E. Rosen (Detroit, Michigan)); Meister v. U.S. Dep't of Agriculture, No. 07-13008 (E.D. Mich. filed July 18, 2007). After the district court ruled in favor of the Forest Service, an appeal was filed with the U.S. Court of Appeals for the Sixth Circuit (the Meister Panel, a three judge panel sitting in Cincinnati, Ohio) which led to a ruling which reversed the prior decision; Meister v. U.S. Dep't of Agriculture, No. 07-13008, slip op. (E.D. Mich. Mar. 30, 2009), rev'd, 623 F.3d 363 (6th Cir. 2010); see also Meister v. U.S. Dep't of Agriculture, No. 09-1712, 2010 WL 5393839 (6th Cir. Nov. 17, 2010).

The Meister panel found deficiencies in the Forest Service's application of the Agency's planning tool, the Recreation Opportunity Spectrum (ROS), and in the Agency's evaluation of snowmobiling and firearm hunting activities. The Meister panel found that these "noisy" activities were allowed to occur in or near the "quieter"

areas in the Forests: the 14 analysis areas (13 of the areas are managed under 2006 Forest Plan Management Area (M.A.) 6.1, Semiprimitive Nonmotorized (SPNM) and one area, the Nordhouse Dunes Wilderness Area is managed under 2006 Forest Plan M.A. 5.1, Wilderness). The Meister panel determined that the 2006 FEIS analysis was deficient because the Forest Service failed to correctly apply the ROS standards in its analysis of the recreation activities that are allowed in the Forests SPNM and Wilderness Areas. The Meister panel held that the Forest Service's approval of the 2006 Forest Plan "was arbitrary and without observance of procedures required by law." Meister, 623 F.3d at 380. On remand, the District Court ordered the Agency to bring the 2006 Forest Plan into compliance with NEPA and NFMA.

The Forests initiated a Supplemental Environmental Impact Statement (SEIS) to supplement the 2006 FEIS analysis and to correct the deficiencies that the Meister panel identified in its ruling. The SEIS responded to significant issues raised by the public in response to the Forest Service's Notice of Intent to prepare a SEIS (75 Fed. Reg. 81,561 (Dec. 28, 2010)).

The SEIS NEPA analysis and Forest Plan amendment were conducted under the authority of NFMA and applicable regulations. The Regional Forester used the procedures of the planning regulations that were in effect before November 9, 2000 (see 1982 Planning Rule, 47 Fed. Reg. 43,026 (Sept. 30, 1982)) used previously to prepare the 2006 Forest Plan. The Forests completed the Final SEIS in January2012. The Huron-Manistee National Forests amended the 2006 Forest Plan.

In May 2012, the plaintiff, Mr. Kurt Meister, contacted the Department of Justice and indicated he was willing to request a dismissal. The Honorable Gerald E. Rosen of the U.S. District Court for the Eastern District of Michigan, Southern Division, issued an order May 30 dismissing the case with prejudice after receiving a stipulation (agreement) of dismissal from the plaintiff, Kurt J. Meister of Plymouth, and the defendants, represented by the U.S. Department of Justice. The decision did not include an out-of-court settlement.

The dismissal, with prejudice, by the U.S. District Court for the Eastern District of Michigan, Southern Division comes roughly two years after Meister successfully appealed his lawsuit. 'With prejudice' means Mr. Meister is not able to raise these issues in court again.

The dismissal allowed the Huron-Manistee National Forests to implement Amendment #1 to the 2006 Forest Plan as described in the Record of Decision for the Supplemental Environmental Impact Statement signed in January, 2012.

General Forest Area

CHAPTER 1

Required monitoring

Comparison of Projected and Actual Outputs and Services

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?

Comparison of projected and actual outputs concentrates on vegetation management. A brief presentation of other 2006 Forest Plan proposed resource management activities occurs at the end of this section.

Moving ecological conditions on the Huron-Manistee National Forests in the direction of desired future conditions as outlined in the Forest Plan, necessitates managing vegetation through appropriate treatments. During Forest Plan revision, vegetative treatments were projected which would achieve desired species composition, age class distribution, Forestwide goals and objectives, and desired future conditions.

Monitoring Methods

The varieties of silvicultural methods implemented were retrieved from the Forest Activity Tracking System (FACTS) and Timber Information Manager (TIM) databases which track timber acreage and volume accomplishments, respectively.

Table 1Table 1shows 2006 Forest Plan projected timber sale acres compared with actual acreage sold since implementation of the 2006 Forest Plan.

The 2006 Forest Plan timber projection acres, Decade 1, contributing to allowable sale quantity (ASQ) from land suitable for timber production, is 128,677 acres.[1] Timber production from lands not suitable for timber production amount to 29,318 acres.[2] Timber projections for the decade, including ASQ, barrens, and fuelbreak acres, total 156,402 acres, Table 1. Acres treated since implementation of the Forest Plan includes 45,166 acres, or 29% of the 156,402 acres projected.

[1] Table D-4, Appendix D, 2006 Forest Plan, page D-4.

[2] Table D-5, Appendix D, 2006 Forest Plan, page D-5. Barrens and fuelbreak creation, as shown in Table D-5, are the major contributors to the acres from non-suitable land. Hazardous fuel reduction acres are primarily prescribed burns.

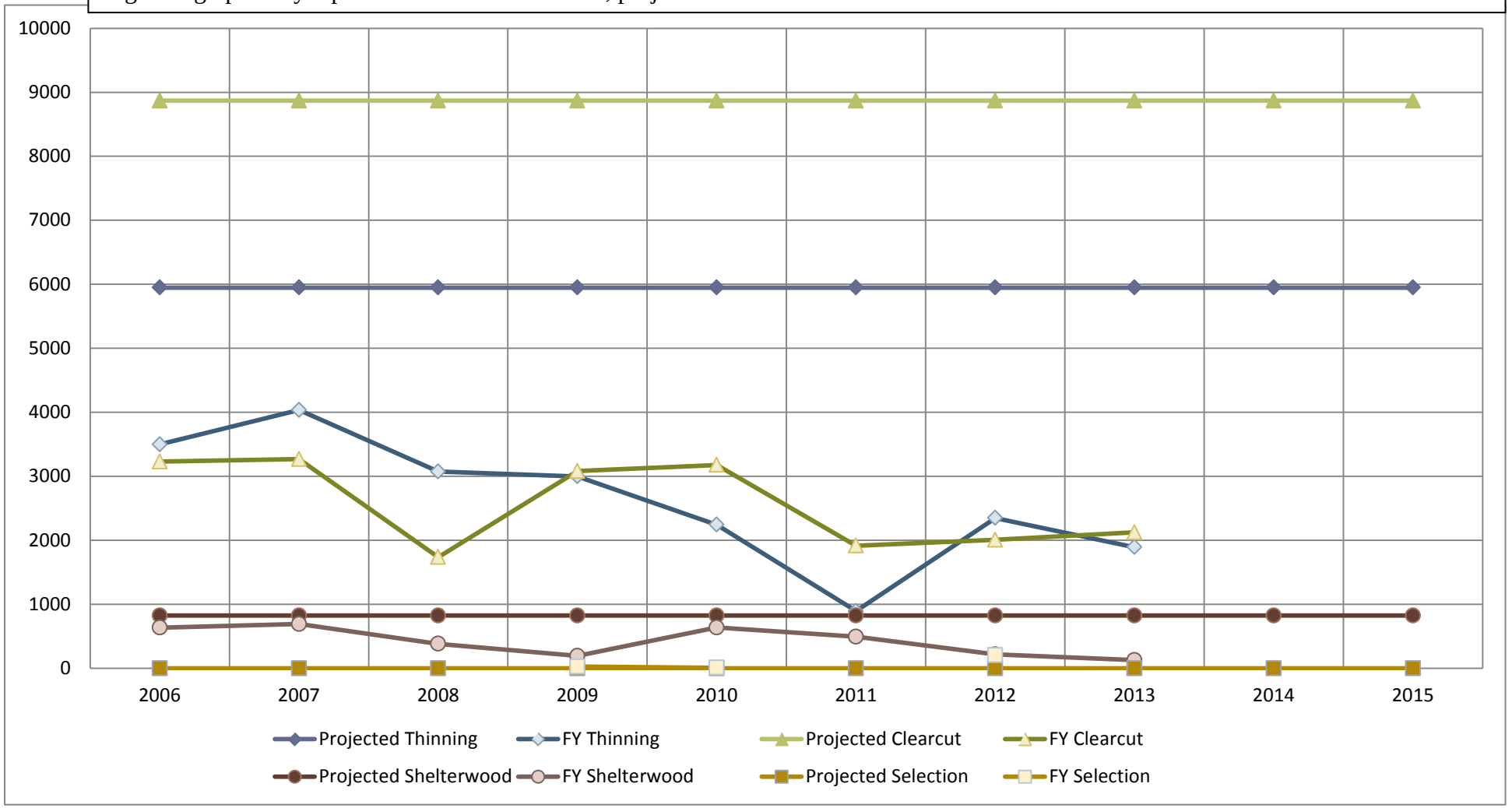
Table 1 2006 Forest Plan Decade 1 Proposed and Probable Silvicultural Method Compared to Actual Sold Acres from Suitable and Not Suitable Forest Land, FYs 2006-2013.

	Thin		Clearcut		Shelterwood		Selection		Total	
Forest Plan Projection: ASQ, PLUS Barrens and Fuelbreaks;										
	Acres	***% of Average Annual Projection***	***Acres***	***% of Average Annual Projection***	***Acres***	***% of Average Annual Projection***	***Acres***	***% of Average Annual Projection***	***Acres***	***% of Average Annual Projection***
Decade 1	59,457	38%	88,684	57%	8,261	5%	0	0%	156,402	100%
Acres Accomplished										
	Acres	***% of Thin***	***Acres***	***% of Clearcut***	***Acres***	***% of Shelterwood***	***Acres***	***% of Selection***	***Acres***	***% of Total Forest Plan Projection***
2006	3,498	59%	3,230	36%	636	77%	0	-	7,364	47%
2007	4,036	68%	3,269	37%	694	84%	0	-	7,999	51%
2008	3,074	52%	1,737	20%	384	46%	27	-	5,222	33%
2009	2,998	50%	3,083	35%	194	23%	10	-	6,285	40%
2010	2,244	38%	3,178	36%	638	77%	0	-	6,060	39%
2011	896	15%	1,917	22%	494	60%	0	-	3,307	21%
2012	2,348	39%	2,009	23%	218	26%	206	-	4,781	31%
2013	1,894	32%	2,126	24%	128	15%	0	-	4,148	27%
Average Annual Acres Sold, 2006-2013										
	2,624	44%	2,569	29%	423	51%	30	-	5,646	36%
Total Accomplished, 2006- 2013										
	20,988	35%	20,549	23%	3,763	46%	243	-	45,166	29%

Source: NRM Staff - FACTS User View Query.

Figure 1 Acres of Projected Average Annual Silvicultural Treatments from Suitable and Not Suitable Forest Land Compared with Actual Fiscal Year Accomplishments, FYs 2006-2013.

Figure 1 graphically represents the data in Table 1; projected silvicultural methods are shown on an annual basis.



Monitoring Results and Evaluation

As was the case in 2010-2011, timber outputs for 2012-2013 continued to lag behind ASQ (chargeable) and nonchargeable acre and volume projections made in the 2006 Forest Plan. At this point of the 2006 Forest Plan, the Forests have prepared about 45,166 acres, or 29 percent of the total 156,402 acres projected, Table 1.

The Forests sell the amount of volume that is funded and budget allocations are not sufficient to meet ASQ. Allocations are based on national priorities and our capability to complete project environmental analyses and prepare and award timber sale contracts is diminished. Markets for forest products should be relatively stable or may improve modestly.

Forest Plan Proposed Practices

Table 2 below contains a comparison of projected outcomes anticipated in the 2006 Forest Plan and the actual outcomes for fiscal years 2006 through 2013. Information in this section is specific to the estimated amount of an activity or practice listed in the 2006 Forest Plan, Appendix D, Table D-6. Proposed Practices (Forest-wide). All management practices, except for managing noxious weeds and the range program, are approaching their 10-year projections.[3]

[3] The range program was discontinued in 2009 when the range permit was no longer requested by the permittee.

Table 2 Forest Plan Projected Outputs Compared to Actual Outputs for Fiscal Years 2006-2013.

Management Activity or Practice	Unit of Measure	Projected Average Annual Amount in the First Decade	FY 2006 Actual	FY 2007 Actual	FY 2008 Actual	FY2009 Actual	FY 2010 Actual	FY 2011 Actual	FY 2012 Actual	FY 2013 Actual	FY 2006 – 2013 Total	% per 2006 - 2013
Wildlife and Fish												
Manage Terrestrial Habitat	***Acres***	7,000	1,306	1,988	1,030	1,376	2,730	18,730	13,760	14,702	61,992	89%
Manage Stream Habitat	***Miles***	121	57	36	35	33	68	96	77	78	384	40%
Manage Lake Habitat	***Acres***	240	364	450	804	154	506	314	199	198	2,989	156%
Nonnative Plant Species												
Manage Noxious Weeds	***Acres***	4,000	173	210	392	656	950	637	1,413	1,355	9,786	24%
Range												
Manage Rangeland Vegetation	***Acres***	312	5	5	5	Range Program Discontinued					15	5%
Fuels												
Hazardous Fuels Reduction and Fuelbreaks	***Acres***	10,000	4,546	4,804	8,050	12,042	17,117	7,044	8,643	9,756	82,002	82%
Watershed												
Maintain and Improve Watershed Condition	***Acres***	100	26	17	16	98	104	59	729	610	1,659	220%
Facilities												
Decommission Classified and Unclassified Roads	***Miles***	20	10.2	3.1	.01	54.8	60.3	24.3	36.4	38.4	247.51	124%
Improve Transportation System – Roads	***Miles***	6	.5	9.8	8.3	9.8	.1	.4	.4	12.8	48.1	80%
Improve Transportation System – Trails	***Miles***	38	8	8	7	4	33	35	1	1.4	135.4	36%
Vegetation												
Establish Forest Vegetation	***Acres***	5,990	4,300	1,840	2,280	2,180	2,183	2,339	1,740	5,838	28,690	48%
Improve Forest Vegetation	***Acres***	935	0	401	129	786	27	82	153	46	2,559	27%

Recommendations

Table 1indicates that clearcutting, presumably aspen[4] clearcutting, continues to lag behind other silvicultural methods, as was illustrated in the 2010-2011 M&E Report. Probable reasons include other management emphases, e.g., conifer management, fuelbreak creation, and barrens restoration. Aspen management is important to woodcock and ruffed grouse habitat (see Population Trends of Management Indicator Species (MIS – Ruffed Grouse, Monitoring Results and Recommendations, page 44 and page 47, respectively).

The continued lack of emphasis on aspen is also illustrated in Table 3in the Timber Product Mix, Timber Resource Sale Schedule section below, which indicates lower aspen volume output compared to other vegetation classes for sold timber sales. The combination total of short-lived and long-lived conifer and low-site and high-site oak volumes indicate more emphasis is being placed on fuelbreak and barrens restoration projects and less on aspen management. It is suggested that a more balanced approach to aspen management and fuel breaks and barrens restoration efforts be considered. Unintended consequences occur in the ability to implement proposed timber sales and other activities as a result of an over emphasis on timber sales which typically contain lower value timber, i.e., smaller diameter, shorter length jack pine and oak timber. When combined with the cost of land survey requirements and NEPA surveys, the resultant values in the long-term, become problematic. Economic analyses would help enumerate and reveal potential long-term, funding implications.

Regarding the proposed practices and management activities shown in Tables 1, 2, and 3, the Forests will continue to explore options to accomplish the objectives indicated.

Timber Sale

Timber Product Mix, Timber Resource Sale Schedule

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

Monitoring Methods

Timber volumes accomplished were retrieved from the Forest Service Timber Information Manager (TIM) database.

Monitoring Results and Evaluation

The mix of species and the amount of sawtimber and pulpwood within a timber sale depends on the timber stand conditions prior to treatment. Treatment prescriptions are designed to meet standards and guidelines

[4] Acres of method of silvicultural treatment by vegetation class are not available from agency databases.

(Forest Plan objectives). The amount of timber sold is a result of the treatment prescription and conditions encountered in the field.

Table 3 contrasts timber volume projections by vegetation class as shown in the 2006 Forest Plan. The table depicts a continued emphasis on short and long-lived conifers. Total volume sold since 2006 is 378.8 million board feet, or 33 percent of the projected 1,161 million board feet.

Table 4 shows sold timber volumes for total chargeable and nonchargeable timber. Chargeable timber is the Allowable Sale Quantity (ASQ). Nonchargeable timber origin volume includes restoration projects and fuel treatments and is not counted against ASQ. In FY 2012, the Huron-Manistee National Forests sold approximately 48.3 million board feet of timber (approximately 77.3 thousand cubic feet), or 53 percent of the 91 MMBF average annual ASQ projected in the 2006 Forest Plan. In FY 2013, the Forests sold approximately 43.1 million board feet of timber (approximately 69 thousand cubic feet), or 47 percent of the 91 MMBF average annual ASQ projected in the 2006 Forest Plan. All of the FY 2012 and FY 2013 volume was recorded against ASQ.

Table 4shows the average annual allowable sale quantity (AASQ) of sold timber volume to-date (2006-2013) is about 41.2 MMBF per year, or 45 percent of AASQ (91 MMBF). Average annual nonchargeable timber volume is about 5.5 MMBF, or 22 percent of projected. Total chargeable and nonchargeable volume sold from 2006-2013 is 373.3 MMBF, or 32 percent of total volume projected for the decade, 1,160 MMBF. As noted in Table 3 and Table 4, the total timber volumes do not exactly equal each other. This is because of variations in the particular Forest Service databases used.

In FY 2012, sawtimber accounted for approximately 29 percent of the total Forests' timber output and pulpwood accounted for 71 percent (timber from suitable and not suitable land).

In FY 2013, sawtimber accounted for approximately 33 percent of the total Forests' timber output and pulpwood accounted for 67 percent (timber from suitable and not suitable land).

The 2006 Forest Plan projected approximately 55 percent sawtimber and 45 percent pulpwood, respectively. The projections do not equal actual. Probable reasons include outdated data used during forest plan revision and an emphasis on barrens restoration, Kirtland's warbler and Karner blue butterfly habitat development, and fuels reduction projects which typically remove pulpwood size material.

The Forests have not varied the mix of timber products since 2000. Ninety-five percent of sales are sold under the pulpwood index, i.e., the predominant timber product that sales are comprised of.[5] What the Forests can influence through timber management is to provide a balanced approach to habitat restoration, fuels, and timber management, i.e., timber product and species offered.

[5] The three timber product indices are: softwood sawtimber, hardwood sawtimber, and pulpwood.

Recommendations

The Forests' objective is to increase timber volume outputs to more closely meet the 2006 Forest Plan projections, but because of low demand for pulpwood as noted in the monitoring results and evaluation section above and with uncertain funding this may not be possible in the short-term.

Table 3 2006 Forest Plan Average Annual Timber Volume Projection - Decade 1, from Lands Suitable and Not Suitable for Timber Production by Vegetation Class.

	Aspen / Birch	% A/B	Short-Lived Conifer	% SLC	Long-Lived Conifer	% LLC	Low Site / High Site Oak	% LSO / HSO	Northern Hardwood	% NH	Total Million Board Feet	*Total %*
2006 Forest Plan Projection, Decade 1 (MMBF)												
	271	23%	130	11%	475	41%	285	25%	0	0%	1,161	***100%***
	Aspen / Birch	**% of Average Annual Projection**	**Short-Lived Conifer**	**% of Average Annual Projection**	**Long-Lived Conifer**	**% of Average Annual Projection**	**Low Site / High Site Oak**	**% of Average Annual Projection**	**Northern Hardwood**	**% of Average Annual Projection**	**Total Million Board Feet**	***% of Total***
Accomplished - Sold Timber Volume, 2006-2013 (MMBF)												
2006	5.1	19%	7.8	60%	16.8	35%	0.8	3%	9.4		39.9	***34%***
2007	4.0	15%	6.1	47%	24.0	51%	3.0	11%	11.0		48.1	***41%***
2008	2.8	10%	7.3	56%	15.3	32%	2.4	8%	6.9		37.4	***32%***
2009	5.0	18%	10.4	80%	24.3	51%	4.8	17%	11.8		56.3	***48%***
2010	6.5	24%	8.1	62%	24.9	52%	4.3	15%	8.7		52.5	***45%***
2011	5.7	21%	8.6	66%	25.4	53%	1.3	5%	12.6		53.6	***46%***
2012	8.1	30%	3.5	27%	24.8	52%	1.6	6%	10.2		48.2	***42%***
2013	5.3	20%	6.3	48%	18.4	39%	2.6	9%	9.9		42.5	***37%***
Average Annual Volume Sold												
	5.3	20%	7.3	56%	21.7	46%	2.6	9%	10.4		47.3	***41%***
Total Volume Sold, 2006-2013												
	42.5	16%	58.1	45%	173.9	28%	20.8	7%	83.2		378.8	***33%***
% of Total Volume Sold, 2006-2013												
		11%		15%		46%		5%				***100%***

Source: I-Web, CUTS203F report. Timber volumes in Tables 3 and 4 differ slightly due to rounding and variation in the available source data reports.

Table 4 Sale Volume on Lands Suitable (Average Annual Allowable Sale Quantity / Chargeable) and Not Suitable (Nonchargeable) FYs 2006-2013 (MMBF).

	AASQ (Chargeable Volume)	% of Chargeable Volume	Nonchargeable Volume	% of Nonchargeable Volume	Total Volume	% of Total Volume
2006 Forest Plan Projected Average Annual Allowable Sale Quantity and Nonchargeable timber, Decade 1						
	91	78%	25	22%	***116***	***100%***
Sale Volume						
FY 2006	30.6	34%	9.7	39%	***40.3***	***35%***
FY 2007	39.6	44%	8.5	34%	***48.1***	***41%***
FY 2008	30.2	33%	7.3	29%	***37.5***	***32%***
FY 2009	47.1	52%	9.3	37%	***56.4***	***49%***
FY 2010	37.9	42%	7.9	32%	***45.8***	***39%***
FY 2011	52.7	58%	1.1	4%	***53.8***	***46%***
FY 2012	48.3	53%	0.0	0%	***48.3***	***42%***
FY 2013	43.1	47%	0.0	0%	***43.1***	***37%***
Average Annual Sold Volume, 2006-2013						
	41.2	45%	5.5	22%	***46.7***	***40%***
Total Sold Volume 2006-2013 Compared to Decadal Projection						
	329.5	36%	43.8	18%	***373.3***	***32%***

Source: I-Web, PTSAR (Sale Details) – PTSR201F, FY Awarded. Timber volumes in Table 3 and Table 4 differ slightly due to rounding and variation in each source data reports.

Savannah

Comparison of Actual and Estimated Costs

How close are projected costs with actual costs?

This item focuses on the budget funding projected to accomplish the FY 2012 and FY 2013 annual program of work, and how close the Forests actually came to expending the funding toward Forest Plan implementation.

Monitoring Methods

Contrary to what this monitoring item suggests, management costs are not enumerated in the 2006 Forest Plan, nor is there any specific direction for costs. Implementation of the Forest Plan is calculated annually because variability of budget, personnel, materials, supplies, vehicular use, inflation, etc. The 2006 Final Environmental Impact Statement analyzed key resource related costs for 2006 Forest Plan implementation, but it did not approach the level of detail necessary to consider all costs involved in managing and administering the Forests' annual program of work. The best way to demonstrate operating costs is to examine the annual budget allocations and expenditures for the Forests.

Costs are estimated annually before each fiscal year begins. Table 5portrays estimated versus actual costs for FYs 2012-2013. The program areas shown in the first column cover most of the Forests' annual operations. These operations relate to specific management goals and objectives in the 2006 Forest Plan.

The table depicts budget allocations and expenditures for the program area funding areas that were used on the HMNF in FY 2012 and FY 2013. These program areas cover most of the annual operations on the HMNF, and most of these operations are related to specific management goals and objectives in the Forest Plan.

Although the tables do not account for the entire budget, e.g., project earmarks, line officer cost pools, and some other administrative costs, it does address most of the resource-related work that was done to help accomplish or support implementation of the Forest Plan.

Monitoring Results and Evaluation

Overall, the Forests spent about 83 percent of the budget allocations in FY 2012 and 108 percent of the budget allocations in FY 2013.

Recommendations

Continue to monitor costs with the purpose of efficiently and effectively spending the Forests' allocated budget to meet the needs of Forest Plan implementation.

Table 5 Estimated Budgeted Costs Compared with Actual Costs.

Program	FY 2012				FY 2013			
	Budget Allocation	***Total Expended***	***Remaining Balance***	***% Expended***	***Budget Allocation***	***Total Expended***	***Remaining Balance***	***% Expended***
National Forest Systems								
Inventory & Monitoring	$508,000	$430,619	$77,381	85%	$429,000	$440,500	$11,500	102.7%
Land Management	$459,248	$427,451	$31,797	93%	$337,300	$336,700	$600	99.8%
Minerals & Geology	$432,000	$360,172	$71,828	83%	$433,000	$417,300	$15,700	96.4%
Forest Products/Timber Sale Management	$2,694,560	$2,551,052	$143,508	95%	$2,709,700	$2,710,000	$300	100.0%
Forest Planning	$258,000	$241,071	$16,929	93%	$96,000	$84,800	$11,200	88.3%
Vegetation & Watershed	$420,700	$338,900	$81,800	81%	$417,000	$424,000	-7,000	107.7%
Recreation, Heritage, Wilderness	$972,700	$843,239	$129,461	87%	$906,900	$898,300	$8,600	99.1%
Wildlife & Fisheries Habitat Management	$1,093,293	$1,023,093	$70,200	94%	$1,042,700	$972,300	$70,400	93.2%
Subtotal – National Forest System	***$6,838,501***	***$6,215,597***	***$622,904***	***91%***	***$6,371,600***	***$6,283,900***	***$87,700***	***98.6%***
Wildland Fire Management								
Fire Preparedness	$2,017,650	$1,745,764	$271,886	87%	$2,021,600	$1,878,500	$143,100	92.9%
Hazardous Fuels Reduction	$1,399,307	$1,003,712	$395,595	72%	$1,629,200	$1,367,300	$261,900	83.9%
Subtotal – Wildland Fire Management	***$3,416,957***	***$2,749,476***	***$667,481***	***80%***	***$3,650,800***	***$3,245,800***	***$405,000***	***88.9%***
Capital Improvement and Maintenance								
Facilities Capital Improvement & Maintenance	$184,042	$152,788	$31,254	83%	$172,100	$168,900	$3,200	98.1%

Program	FY 2012				FY 2013			
	Budget Allocation	***Total Expended***	***Remaining Balance***	***% Expended***	***Budget Allocation***	***Total Expended***	***Remaining Balance***	***% Expended***
Legacy Roads & Trails	$48,000	$44,084	$3,916	92%	$125,000	$123,000	$2,000	98.4%
Roads Capital Improvement & Maintenance	$558,937	$532,810	$26,127	95%	$576,000	$570,400	$5,600	99.0%
Trails Capital Improvement & Maintenance	$339,772	$291,639	$48,079	86%	$313,800	$310,700	$3,100	99.0%
Subtotal – Capital Improvement & Maintenance	***$1,130,751***	***$1,021,375***	***$109,376***	***90%***	***$1,186,900***	***$1,173,000***	***$13,900***	***98.8%***
LWC, FH and S&PF Fund								
Land & Water Conservation Fund	$43,000	$41,880	$1,120	97%	37,000	$37,200	-$200	100.5%
Forest Health	$8,913	$987	$7,926	11%				
State & Private Forestry					$32,000	$24,700	$7,300	77.2%
Subtotal – LWC, FH, S&PF Funds	***$51,913***	***$42,867***	***$9,046***	***82.6%***	***$69,000***	***$61,900***	***$7,100***	***89.7%***
Trust Funds								
K-V Regular	$1,348,000	$699,037	$648,963	52%	$1,028,000	$901,800	$126,200	87.7%
K-V Special (KV2)	$11,000	$10,594	$406	96%	$362,000	$236,000	$126,000	65.2%
Reforestation Trust	$9,000	$8,414	$586	93%	$16,000	$12,900	$3,100	80.6%
Cooperative Work	$325,000	$274,232	$50,768	84%	$300,000	$350,300	$-50,300	116.8%
Subtotal – Trust Funds	***$1,693,000***	***$992,277***	***$700,723***	***59%***	***$1,706,000***	***$1,501,000***	***$205,000***	***88.0%***
Permanent Fund								

Program	FY 2012				FY 2013			
	Budget Allocation	***Total Expended***	***Remaining Balance***	***% Expended***	***Budget Allocation***	***Total Expended***	***Remaining Balance***	***% Expended***
Conveyance of Administrative Sites	$15,000	$13,312	$1,688	89%	$13,000	$8,000	$5,000	61.5%
Recreation Enhancement Act	$400,000	$301,606	$98,394	75%	$500,000	$464,600	$35,400	92.9%
GB Gift	$9,666	$4,541	$5,125	47%	$5,000	$4,200	$800	84.0%
Map Collections	$9,000	$5,623	$3,377	62%	$8,000	$7,900	$100	98.8%
SRS	$266,000	$247,676	$18,324	93%	$23,300	$20,600	$2,700	88.4%
Salvage Sale Funds	$80,000	$39,656	$40,344	50%	$71,000	$57,800	$13,200	81.4%
Stewardship Carryover	$141,653	$4,300	$137,353	3%	$243,000	$31,300	$211,700	12.9%
Cost Recover Minor Funds	$2,000	$356	$1,644	18%	$7,000	$8,900	$-1,900	127.1%
Quarters Maintenance					$16,000	$13,000	$3,000	81.3%
Cost Recovery – Major Projects					$0.0	$4,800	$-4,800	-
Subtotal –Permanent Funds	***$923,319***	***$617,070***	***$306,249***	***67%***	***$2,592,300***	***$2,122,100***	***$470,200***	***81.9%***
Facilities Maintenance	$403,000	$366,105	$36,895	91%	$413,000	$397,100	$15,900	96.2%
Other Funds								
Federal Highway Administration	$14,000	$19,151	$-5,151	137%				
Public Lands Highway Transportation Plan	$4,860	$4,619	$241	95%				
Subtotal –Other Funds	***$421,860***	***$389,875***	***$31,895***	***92%***	***$413,000***	***$397,100***	***$15,900***	***96.2%***
Other								
General Management					$0.0	$916,400	$-916,400	-

Program	FY 2012				FY 2013			
	Budget Allocation	***Total Expended***	***Remaining Balance***	***% Expended***	***Budget Allocation***	***Total Expended***	***Remaining Balance***	***% Expended***
Direct Project Activities					$0.0	$13,800	$-13,800	-
Legislative & Public Communications					$0.0	$106,900	$-106,900	-
Ongoing Business Operations					$0.0	$438,100	$-438,100	-
Common Services					$0.0	$695,000	$-695,000	-
TOTALS	***$14,476,301***	***$12,028,537***	***$2,447,764***	***83%***	***$14,283,600***	***$15,454,000***	***$-2,170,200***	***108.1%***

Source: WorkPlan, Report ID Trk2a, Resource Tracking Summary by Work Code, 03/22/2010.

West Forest Trail Road, Manistee/Cadillac Ranger District

Effects of Forest Management on Land, Resources, and Communities Adjacent to or Near the National Forests

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

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

Payments from Federal Lands can represent a significant portion of county budgets. This report shows the payments that county governments receive from federal sources, including Payments in Lieu of Taxes (PILT), the 25 Percent Fund, and the Secure Rural Schools and Community Self-Determination Act (SRS).

"Payments in Lieu of Taxes" (PILT) are federal payments to local governments that help offset losses in property taxes due to nontaxable federal lands within their boundaries. 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. PILT payments help local governments carry out such vital services as firefighting and police protection, construction of public schools and roads, and search-and-rescue operations. PILT payments are one of the ways that the federal government fulfills its role of being a good neighbor to local communities.

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 Counties 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 Emergency Economic Stabilization Act of 2008 (Public Law 110-343) was enacted on October 3, 2008 and authorized full funding for the PILT program from 2008 through 2012. The Secure Rural Schools Act had some significant changes. To implement the law, the Forest Service requested states and counties to elect either to receive a share of the 25-percent rolling average payment or to receive a share of the Secure Rural Schools State (formula) payment by November 14, 2008 (county elections). A county electing to receive a share of the State payment also was requested to allocate between 15 to 20-percent of its share for one or more of the

following purposes: projects under Title II of the Act; projects under Title III; or the Treasury of the United States (county allocations).

On October 2, 2013, the Secure Rural Schools and Community Self-Determination Act of 2000 was reauthorized for federal fiscal year 2013 as part of Public Law 113-40. The one-year reauthorization provides for payments to States that are distributed to counties in which national forests are situated. Details of the reauthorization are on the Forest Service Secure Rural Schools Act web site www.fs.usda.gov/pts/. Please note that any payment amounts may be subject to sequestration.

The State must transmit, for each county in which a national forest is situated, the county's election to receive a share of the Secure Rural Schools Act (SRS) State Payment or a share of the State's 25-percent payment. Counties electing the SRS State Payment must provide the allocation of that payment into either Title I, Title II, or Title III.

If the State fails to transmit an eligible county's election by the deadline, the county shall be considered to have elected to expend 80-percent of its share of the SRS State payment for public schools and roads (commonly called Title I). The remaining 20-percent will be available to the Forest Service to carry out projects in the eligible county to further the purposes of Title II of the 2008 reauthorization of the Secure Rural Schools and Community Self-Determination Act of 2000.

Table 6and Table 7show the breakdown of 25 Percent Funds and SRS (estimated), and PILT payments for FY 2012 and FY 2013.

Table 6 Payments to Counties, FY 2012.

County	Acres	25% Fund	SRS	Acres - PILT	PILT
Alcona	114,742	$109,392	$0.00	51,877	$100,185
Crawford	38,493	$0.00	$72,027	33,252	$51,645
Iosco	114,135	$108,777	$0.00	60,399	$121,383
Lake	112,437	$61,428	$0.00	74,442	$164,692
Manistee	87,701	$0.00	$143,728.34	59,582	$83,302
Mason	60,703	$33,166	$0.00	45,292	$101,503
Mecosta	3,459	$0.00	$6,232.83	1,856	$2,525
Montcalm	1,760	$0.00	$4,091.65	1,761	$2,998
Muskegon	12,547	$6,855	$0.00	11,819	$27,044
Newaygo	111,356	$0.00	$201,950	67,982	$77,900
Oceana	53,342	$29,142	$0.00	32,760	$71,826
Ogemaw	20,183	$0.00	$38,0656	5,901	$2,004
Oscoda	154,534	$0.00	$294,995	76,587	$73,621
Wexford	96,992	$0.00	$157,751	56,201	$93,757
TOTAL	***982,384***	***$348,759***	***$1,261,432***	***579,711***	***$974,385***

Source: W.S. Department of Interior, Payments in Lieu of Taxes (PILT) County Payments and Acres; Website http://www.doi.gov/pilt/county-payments.cfm
Forest Service, Draft Payment Detail Report PNF, All Services Receipts
(ASR-10-02) – 25% Fund and SRS http://www.fs.usda.gov/main/pts/securepayments/projectedpayments

Table 7 Payments to Counties, FY 2013

County	Acres	25% Fund	SRS	Acres - PILT	PILT
Alcona	114,742	$109,392	$0.00	51,877	$99,273
Crawford	38,493	$0.00	$68,678	33,252	$54,458
Iosco	114,135	$108,777	$0.00	60,399	$119,945
Lake	112,437	$61,428	$0.00	74,442	$160,028
Manistee	87,701	$0.00	$137,035	59,582	$90,129
Mason	60,703	$33,166	$0.00	45,332	$98,779
Mecosta	3,459	$0.00	$5,944	1,856	$2,756
Montcalm	1,760	$0.00	$3,901	1,761	$3,107
Muskegon	12,547	$6,855	$0.00	11,819	$26,315
Newaygo	111,356	$0.00	$192,547	67,982	$84,099
Oceana	114,742	$109,392	$0.00	51,877	$99,273
Ogemaw	38,493	$0.00	$68,678	33,252	$54,458
Oscoda	114,135	$108,777	$0.00	60,399	$119,945
Wexford	112,437	$61,428	$0.00	74,442	$160,028
TOTAL	***87,701***	***$0.00***	***$137,035***	***59,582***	***$90,129***

Source: W.S. Department of Interior, Payments in Lieu of Taxes (PILT) County Payments and Acres; Website http://www.doi.gov/pilt/county-payments.cfm
Forest Service, Draft Payment Detail Report PNF, All Services Receipts
(ASR-10-02) – 25% Fund and SRS: http://www.fs.usda.gov/main/pts/securepayments/projectedpayments

Monitoring Results and Evaluation

Towns are sent information regarding payments as soon as it is released.

Recommendations

Increase the ratio of sawtimber to pulpwood (see Timber Product Mix, Timber Resource Sale Schedule, Monitoring Results and Evaluation, page 13) to approach projections made in the 2006 Forest Plan and potentially increase payments to the State and local governments.

Towns will continue receiving the status of Payments to Counties legislation as well as the yearly appropriations

Tree planting

Lands are Adequately Stocked

Are harvested lands adequately restocked after five years?

National Forest Management Act regulations require cutover lands to be adequately restocked five years following final harvest. This regulation applies where the objectives, expressed in the 2006 Forest Plan, indicate the need to reforest areas that have been cut-over or otherwise denuded or deforested. This monitoring item measures to what extent the National Forests' are sustainably growing trees following harvest treatments that remove mature trees. Restocking occurs naturally in most aspen, oak, or other hardwood forest types and by planting or seeding in the pine and oak types, or a combination of these methods. Stands with stocking below the desired density prescribed for the stand are planted to ensure adequate regeneration within five years following the final harvest.

Monitoring Methods

Stocking surveys measure the amount of tree regeneration between the first and fifth growing seasons after a regeneration harvest is completed; survival surveys measure seedling survival during the first and third growing seasons following planting. Stands meeting or exceeding the minimum number, distribution, and size of desired stems per acre are considered successfully regenerated (but usually not before the third growing season). Forest Service personnel perform these surveys using the protocols established in agency manuals and handbooks.

Stocking surveys were conducted on 12,991 acres during FY 2012-FY 2013. 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 Query Activity Data View, Web Report: Activity Code 4341, Stocking Surveys).

Monitoring Results and Conclusions

In FY 2012-FY 2013, 6,746 acres were certified as satisfactorily stocked. Table 8indicates the classifications of the certifications.

Table 8 Acres of Land surveyed for Stocking.

Type of Regeneration Survey	2012	2013	Total
4341 – Stocking Surveys, Natural Regeneration	3,582	9,409	12,991
4382 – Survival Surveys, Planted Seedlings	1,613	2,327	3,940
Total	***5,195***	***11,736***	***16,931***

Source: FACTS Query Activity Data View, Web Report: Completed Activities 4341, 4342 (stocking or plantation survival surveys, First and Third year surveys) FYs 2012-2013.

Table 9displays the acres of land certified as satisfactorily stocked as a result of these surveys for fiscal years 2012 and fiscal 2013. Natural regeneration following a large wildfire, the Meridian Fire (4,294 acres), is included in Table 9, and greatly increased the acres certified without site preparation in 2013.

Table 9 Acres of Land Certified as Satisfactorily Stocked 2012 and 2013.

Certifications by Type of Regeneration	2012	2013
4381 – Natural Regeneration with Site Preparation	666	1,166
4382 – Natural Regeneration without Site Prep	294	4,331
4383 – Planted Areas	669	1,249
4384 – Seeded Areas	0	0
Total	***1,629***	***6,746***

Source: FACT ACTV 160 VW from FACTS database for activities 4482-4484 for FY 2012 and 2013.

Table 10shows the acres of harvested lands progressing, not yet certified, toward adequate restocking for fiscal year 2012 and fiscal year 2013.

Table 10 Acres of Land Progressing Towards Satisfactorily Stocked in 2012 and 2013.

Type of Regeneration	2008-2013	2007-2012
Natural Regeneration with Site Preparation	907	520
Natural Regeneration without Site Preparation	780	5,071
Planted Areas	5,019	5,294
Seeded Areas	0	0
Total	***6,706***	***10,885***

Source: FACTS Query Activity Data View, Web Report: Planned Activities 4381, 4382, 4383, 4384 (certification of natural regeneration, planted, or seeded areas) FY's 2007 – 2013.

Stocking/survival surveys are conducted as required on all cutover lands on the Forests and restocking of cutover lands on the Forests' meets the requirements of the National Forest Management Act. Surveys are also conducted on non-qualifying areas, including recently acquired National Forest land parcels and existing National Forest land areas undergoing forest restoration.

Table 11shows the amount of qualifying cutover lands (regeneration harvests: clearcuts, removal, and selection cuts) during the period 2009-2010, and certification of restocking for these same locations during the period 2012-2013; this three year period represents the minimum time period in which cutover lands harvested between 2009-2010 could be certified as restocked by 2012-13. The percentage of satisfactorily stocked stands during this period demonstrates that implementing the Forests' 2006 Forest Plan is effective, and that current management practices, are successful at initiating restocking of cutover lands. The majority of regeneration harvests occur in the jack pine or aspen forest cover types; the percent certified as satisfactorily stocked reflects the typical progress of reforestation in these cover types. Jack pine is usually planted, and a 1-2 year lag period

occurs between completion of the harvest and seedling planting. Aspen, which suckers from the roots of cut trees, does not have this lag period. However, the Forest adequately regenerates all cutover lands within the required 5 year time period after harvest, unless a decision is specifically made to implement the Forests' 2006 Forest Plan Standards and Guidelines.

Table 11 Acres of Regeneration Harvest by Method FY 2009-2010 and Certification of Reforestation FY 2012-2013.

Fiscal Year Harvest	Regen Harvest, Clearcut	Regen Harvest, Removal	Regen Harvest Selection	Total Regen Harvest	Certified Acres Of Cut	% Certified as Satisfactorily Stocked	Fiscal Year Certified
2009	1,047	300	15	1,362	960	70	2012
2010	1,333	301	10	1,644	1,203	73	2013
Total	***2,380***	***601***	***25***	***3,006***	***2,163***	***72***	***2012-13***

Source: FACTS Query Activity Data View, Web Report: Completed Cut Activities 4100 (all) for FY's 2009 – 2010. Certified acres are from Table 2 for 4381 and 4382 minus the Meridian Fire acres (4,294).

The Forests' restocking and certification of cut-over land accomplishments are consistent with the National Forest Management Act. In addition, the 2006 Forest Plan's Standards and Guidelines provide adequate direction to identify those site-specific, project-level decisions that effectively implement Management Area Direction.

Two Standards and Guidelines regarding timber management are associated with certification: the predominance of even-age silviculture, and seasonal restrictions in timber sale contracts that result in most regeneration harvesting occurring during the dormant season. These results are consistent with the assumptions in the 2006 FEIS regarding long-term sustained yield and non-declining yield constraints; forest regrowth is consistent with yield tables used to develop Spectrum model inputs.

Recommendations

Project level interdisciplinary teams should continue to fully incorporate the length of time and costs necessary to restock and certify cut-over lands in vegetation management decisions. The emerging trend in silvicultural practices, especially in regeneration harvesting, will result in a short term shift from young to older age vegetation classes, especially in aspen, long-lived conifers and low and high-site oaks. Monitoring methods to answer the question "Are Lands Adequately Stocked" are sufficient and no changes are recommended to current Forests' procedures.

Planted Trees

Soils

Are the effects of forest management, including prescriptions, resulting in significant changes to productivity of the land?

The Forests' 2006 Land and Resource Management Plan provides several Guidelines to sustain soil productivity, which is defined as the potential to produce vegetation that depends on the interaction of physical, chemical, and climatic characteristics of sites where management activities occur. This monitoring item measures to what extent the National Forests' are sustaining the capacity of soils to produce a variety of flora impacted by vegetation treatments, wildfire and prescribed fires, recreational uses, transportation systems, and mineral extraction. In addition, National Best Management Practices (BMPs) for Water Quality Management on National Forest System Lands (FS990a), volume 1, provides specific guidance for protecting soil productivity in a variety of ground disturbing activities. Sustainable Soil and Water Quality Practices on Forest Land, a Michigan Department of Natural Resources publication (2009) provides BMPs specific to timber harvesting and associated activities pertinent to this monitoring question.

Monitoring Methods

Commercial timber sales are evaluated for soil compaction, rutting, and organic matter removals. Sites impacted by wild or prescribed fires are evaluated for mineral soil exposure and stabilization of mechanically constructed control lines. Recreation sites and trails are evaluated for soil compaction and erosion problems. Transportation system components are reviewed for rutting, soil compaction, organic matter displacement, and erosion, and to monitor roads obliterated or de-commissioned (closed to motorized vehicle use). Mineral extraction sites are monitored for erosion and vegetation regrowth after commercial activities have ceased.

All evaluation and monitoring is done by the Forests' personnel, on either an annual basis or after commercial activities are in progress or are completed.

Monitoring Results: Commercial Timber Sales

The Long-term Soil Productivity Study of Aspen Ecosystems of the Northern Great Lakes Region (NRS-17) is used as a baseline to evaluate organic matter removal and compaction to soil productivity on the Forests for two reasons: one of the research sites is located on the Huron National Forest, and the research harvest scenarios are representative of the soil resources and commercial harvest methods and impacts commonly found throughout the Forests'. The 10-year results of this study suggest that, with compaction limited to that due to mechanical harvesting, either main bole or whole stem harvest of aspen forests on all three soil types (loamy sand, silt loam, and clay loam textures) can tolerate these harvest intensities without significant reductions in total woody or aspen biomass production.

Commercial timber sales on the Forests' restrict wood removal to main bole only or whole stem harvest; in addition, harvest operations are restricted to periods when rutting or excessive compaction are not likely to occur, and limit the amount of soil and organic matter displacement to less than 15 percent of the pre-existing condition. The Forests' harvest inspection and reforestation personnel monitor and verify these, and similar standards, that are part of forest vegetation prescriptions.

The extent of timber sales ground disturbances are consistent with BMPs; temporary roads and log landings and skid trails are within the recommended percentage of the total harvest areas. Skid trails, log landings, and the general harvest area were generally well vegetated and showed little signs of rutting or erosion. Portions of temporary roads have insufficient vegetative cover and no erosion controls. In some instances, erosion was evident and locally severe as a result, or rutting exceeded area guidelines (greater than 4 – 6" in depth). In all treatment areas, instances of erosion were small, isolated, and soil movement was minimal, primarily due to heavy slash retention. There appeared to be little impact to soil productivity. Overall, implementation of 2006 Forest Plan guidelines and BMPs appeared adequate across all harvest areas monitored. Harvest activities appeared to have little impact on soil productivity as a result.

Monitoring Results: Wildfire and Prescribed Fire

These events affect soil productivity by killing vegetation and reducing surface soil organic matter; depending on the severity of the fire, mineral soil may become exposed and subject to other adverse effects such as erosion and decline of soil organisms. Direct ground disturbance occurs by use of mechanical equipment to construct temporary control lines, which require rehabilitation to maintain soil productivity. Notable large wildfires have occurred on the Huron National Forest in 2006 (Hughes Lake) and 2010 (Meridian Boundary); the amount of smaller wildfires averages 100 acres/year on within the Forests' fire protection boundary. The amount of prescribed fire (broadcast and pile burning) on the Forests' has averaged 3,031 acres/year (Source: FACTS Query Activity Data View, Web Report: Completed Activities 1111 – 1113, 1130, FY's 2005 – 2011).

The effects of large wildfires are assessed using the protocols of Burned Area Emergency Response (BAER) teams; the BAER team includes a soils specialist report. The soils specialist report for the Meridian Boundary (Corner, 2010) concluded that, because of the overall moderate burn severity level, no critical values or threats with the soil resource were identified or expected.

Prescribed fires on the Forests' are conducted using individual prescribed burn plans, which include monitoring of the effects on the soils and rehabilitation of constructed control lines. The severity level of prescribed fires are typically low to moderate, as this level is sufficient to provide for attaining the objectives and minimizing the risk of fire spread beyond the control lines. The severity levels of small wild fires are also typically low to moderate, as these events usually occur early in the growing season when soil and surface organic layer moisture levels minimize duff consumption and prevent mineral soil exposure. Evaluations of prescribed and wild fire effects on the soil resource include an assessment of the amount of exposed mineral soil and rehabilitation of constructed control lines. In all prescribed fire areas, instances of erosion were small, isolated, and soil exposure met the goals of the fire, e.g. seed bed requirements for direct seeding of grasses and forbs. Evaluations of wild fires are conducted individually when indicators of erosion or delayed vegetation re-growth occur. Usually, there is little impact to soil productivity, primarily because fire severity does not delay natural or prescribed re-vegetation of burned areas, and constructed control lines are rehabilitated, and seeded when necessary. Overall, implementation of Forest Plan guidelines and BMPs appeared adequate across all fire areas monitored. Prescribed and wild fire activities appeared to have little impact on soil productivity as a result.

Monitoring Results: Transportation System

The Forests' transportation system has two components: permanent and temporary/unclassified roads. Monitoring for effects on the soil resource from Forest roads is limited to the latter component, as these are local sources of rutting, erosion, compaction, and organic matter displacement. Temporary and unclassified Forests' roads are obliterated, and permanent Forests' roads are de-commissioned (placed in Maintenance Level 1, intermittent/administrative use). De-commissioned roads are either blocked with earthen berms/natural debris/rock, or gated for administrative use, and will not be subject to further compaction, rutting, erosion, and organic matter displacement caused by unrestricted vehicle use. Water diversion methods are installed, and culverts remain in place to minimize erosion and preserve the roadbed until the road is re-opened to the public for motorized uses. Obliterated roads are blocked or gated, and the roadbed is disrupted to discourage motor vehicle use; existing culverts are removed and appropriate water diversion and re-vegetation methods are implemented to allow the roadbed to recover from compaction and other motor vehicle impacts.

Table 12displays the number and miles of Forest or user developed roads obliterated or de-commissioned for fiscal years 2013 - 2014 and fiscal years 2006 – 2011.

Table 12 Roads Obliterated or De-Commissioned Fiscal Years 2013-2014 and 2006-2011.

Road Activity Type	2012 – 2013		2006 - 2011	
Obliterated (access blocked, roadbed disrupted)	31.8 miles	11 areas	50.9 miles	124 roads
De-commissioned (access blocked only)	9.9 miles	24 areas	37.3 miles	63 roads
Total	*41.7 miles*	*35 areas*	*88.2 miles*	*187 roads*

Source: FACTS Query Activity Data View, Web Report: Completed Activities 9003, 9004 FY's 2006 – 2011.

Obliterated and de-commissioned roads are periodically evaluated for effectiveness of the vehicle barriers and re-vegetation status. Overall, implementation of Forest Plan guidelines and BMPs appeared adequate across Forest roads that were evaluated. Transportation monitoring activities appear to have had a positive impact on soil productivity.

Monitoring Results: Mineral Extraction

Monitoring of mineral extraction on the Forests' for fiscal years 2012 and 2013 included 33 and 28 producing or reclaimed oil and gas sites, respectively; common variety minerals, such as sand and gravel, were not produced in these years. Stipulations for surface occupancy of oil and gas leases include construction and reclamation conditions to minimize impacts to soil resources. These stipulations are intended to ensure the conservation of topsoil while the site is under construction, as well as measures that promote re-vegetation of disturbed areas with native species when the site is in either the production or abandonment stage. Inspection of existing producing or reclaimed sites shows satisfactory compliance with these soil conservation stipulations. Overall, implementation of 2006 Forest Plan guidelines and BMPs appeared adequate for all oil/gas exploration and development sites. Mineral extraction monitoring activities appear to have had a positive impact on soil productivity.

Monitoring Results and Evaluation

The Forests' FEIS discussed the effects of biomass removals and soil disturbance as the two most important elements influencing soil productivity, especially regarding cumulative effects. The findings presented in the 2006 FEIS concerning biomass removals can be summarized as a possible short-term loss in soil productivity; however, under all alternatives, long-term site productivity would be maintained in accordance with federal regulations and 2006 Forest Plan Standards and Guidelines. The sites most likely to suffer impaired soil productivity were recognized then, and still are, are low productivity stands where rotation length is less than 50 years and above ground whole tree harvesting occurs. The loss of organic matter through burning may also reduce site productivity, but is not significant unless there is little or no recovery of vegetation between burn events. Coincidently, these events expose low-productivity soils dominated by jack pine, as the most at risk of impaired site productivity.

Soil disturbances discussed in the 2006 FEIS are those related to commercial harvests (compaction), reforestation (scarification, burning), and road/trail uses (erosion, stream crossings). The findings presented in the 2006 FEIS concerning this can be summarized as having minimal cumulative increase in soil disturbance and a negligible effect on soil productivity; however, under all Alternatives, long-term site productivity would be maintained in accordance with federal regulations and 2006 Forest Plan Standards and Guidelines.

The 2006 FEIS conclusions regarding effects analysis are still valid, and current conditions appear to validate that soil productivity is not impaired by Forest Management Treatments. However, more site specific monitoring of these conclusions, especially compaction and biomass removals, may not be fully validated by standards at FSH 2509.18, and represents a potential for unintended consequences. Monitoring of wild and prescribed fires, recreation, transportation, and mineral exploration and development demonstrates that implementing the 2006 Forest Plan is more effective where these focused activities occur.

Atmospheric deposition of nitrogen and sulfur dioxides, and regional ozone concentrations, are known to have impacts on soil productivity and vegetation growth. As these influences are not specifically addressed in the 2006 Forest Plan and 2006 FEIS, there is an unknown degree of risk and uncertainty surrounding how these affect long-term soil productivity. The State of Michigan (MDEQ) and the Forest Service (FIA) perform some monitoring of these influences, but data collection is not usually sufficient to assess Forest-wide impacts.

Recommendations

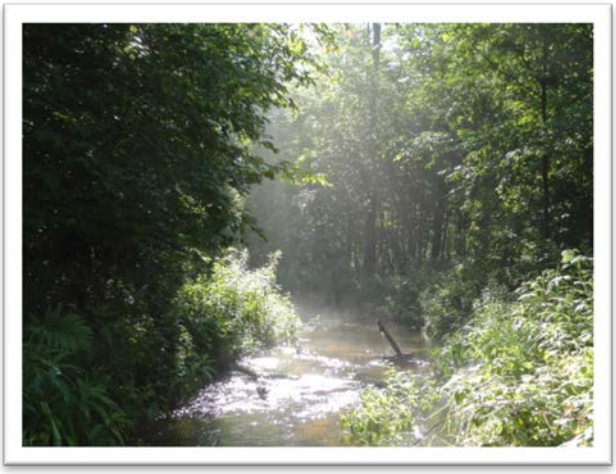
Project level interdisciplinary teams should continue to fully incorporate mitigation measures necessary, e.g., biomass retention, slope restrictions, soil drainage considerations, to protect soil productivity in vegetation management decisions.

The Huron-Manistee National Forests should initiate the protocols of an established Soil-Disturbance Monitoring Protocol (*e.g.* Page-Dumroese et al. 2009) to ensure that standards at FSH 2509.18 are achieved at the site-specific scale. Over the next several years, the associated Soil-Disturbance monitoring protocol should be implemented, consistent with Forest Service Handbook and R9 Regional guidance, across treatment types and Districts. This effort should be accomplished in coordination with other National and Regional programs, e.g. Regional Guidance for implementation of National Best Management Practices (Forest Service 2012), Watershed Condition Framework (Potyondy and Geier 2011), etc. This will provide for the establishment of a

quantitative record of expected soil disturbance levels associated with management activities; as well as a record of associated BMP effectiveness.

To ensure and demonstrate compliance with the National Forest Management Act, the Huron-Manistee National Forests should aggressively seek assistance from the academic community, Forest Health Protection, Northeastern Area State & Private Forestry, and or the Northern Research Station, to document the effects of forest management on soil productivity. This effort should focus on low productivity stands under short-rotation management (e.g. rotations less than 50 yrs.); especially where above ground whole tree harvesting occurs – *i.e.* jack pine and aspen management. Similarly, effects of prescribed fire and wildfire should be documented. This would also allow the Forests to quantitatively respond to the 2006 Forest Plan monitoring question, "Are the effects of forest management, including prescriptions, resulting in significant changes to productivity of the land?" (Forest Plan, Table IV-3, p. IV-9).

The Huron-Manistee National Forests should aggressively seek specialist assistance from the academic community, Forest Health Protection, Northeastern Area State & Private Forestry, and or the Northern Research Station, to document the effects of atmospheric deposition and ozone concentration on long term soil productivity.



Peterson Creek

Population Trends of Management Indicator Species

(MIS)- Brook Trout and Mottled Sculpin

What are the population trends of management indicator species? What are the relationships of the population trends to habitat changes? Are minimum viable populations of appropriate native and desirable non-native species being maintained within the planning area?

Monitoring Methods

There a number of approaches being used for monitoring of management indicator species (MIS): (1) Representative streams within watersheds that are predominately National Forest ownership; (2) Michigan Department of Natural Resources' Stream Status and Trends program (SSTP; Wills et al. 2008); and, (3) sites that are part of Tribal or other partner studies. Table 13lists the respective sites on the Huron-Manistee National Forests that have been sampled during since the Forest Plan was revised in 2006 as part of MIS monitoring.

Table 13 Streams on the Huron-Manistee National Forests that have Forest Service Sampling Stations or are part of the Michigan Department of Natural Resources Stream Status and Trends Program (SSTP) for the Monitoring of MIS and Associated Habitat.

Stream	Location		
	National Forest	*Watershed, County*	*Type of Site*

Stream	Location		
	National Forest	*Watershed, County*	*Type of Site*
Bigelow Creek	Manistee	Muskegon River, Newaygo	SSTP Long-Term, USFS
Martin Creek	Manistee	S Branch White River, Oceana	SSTP General Survey
Perry Creek	Huron	Au Sable River, Oscoda	SSTP General Survey
Cedar Creek	Manistee	Muskegon River, Oceana	USFS
Cedar Creek	Manistee	Manistee River, Wexford	Partner (UND)
Mena Creek	Manistee	White River, Oceana	USFS
Fairchild Creek	Manistee	Pine River, Wexford	USFS
Pine Creek	Manistee	Manistee River, Manistee	USFS, Tribal (LRBOI)
Poplar Creek	Manistee	Pine River, Wexford	USFS
Peterson Creek	Manistee	Manistee River, Manistee/Wexford	USFS
Sickle Creek	Manistee	Manistee River, Manistee	Tribal (LRBOI)

Only Bigelow Creek and Cedar Creek (Wexford County) were sampled in 2012-13. The Cedar Creek sampling was done by the University of Notre Dame as part of an evaluation of a culvert replacement project. Brook trout and mottled sculpin were present although brown trout were the predominant species encountered at this stream. No brook trout were captured at Bigelow Creek in 2013.

No Michigan DNR SSTP sampling occurred at any sites in 2012-13.

Eight tributaries of the Manistee River between Hodenpyl Dam and Tippy Dam are being intensively evaluated through a collaborative study by Little River Band of Ottawa Indians (LRBOI) and Michigan Technological University (Holtgren and Ogren 2012). The purpose of this study is to determine the potential for a grayling reintroduction. During the 2012-13, a total of 2,547 fish representing 18 species were encountered. Salmonid species (brook, brown, and rainbow trout) made up greater than 50% of the overall catch (1,589) with "other" species (slimy sculpin, Cyprinids, etc.) accounting for the remaining catch.

In addition, the LRBOI conducted their ongoing monitoring of Sickle and Pine Creek in 2012-13. Brook trout and mottled sculpin were present. Other than presence or absence, no discernible trends are evident. However, this data set will serve as part of the baseline for long-term trend monitoring of both the aquatic MIS.

Monitoring Evaluation and Conclusions

Other than presence or absence, no long-term trend analyses of brook trout and mottled sculpin population levels were attempted from the data collected over the past two years. This should be undertaken as more annual monitoring data is gathered.

Existing stream fish population data from the Huron-Manistee National Forests should be analyzed into an organized data set for comparative baseline purposes. In addition, data collected by other agencies, universities, and the Tribes should continue to be incorporated into MIS monitoring. The Michigan DNR SSTP program

should be fully utilized for monitoring purposes, both in terms of MIS species monitoring and a stream habitat perspective. Other data collected by the Michigan Department of natural Resources from streams on the Huron-Manistee National Forest such as Fisheries Surveys or Status of the Fishery Reports should be incorporated into the MIS monitoring program wherever possible (e.g., Peterson Creek Status of the Fishery Report; Tonello 2012). Data from the Little River Band of Ottawa Indians long-term monitoring program should also continue to be utilized. Finally, the data being gathered by the collaborative study between the LRBOI and Michigan Tech on the eight tributaries to the Manistee River between Hodenpyl Dam and Tippy Dam will make an excellent long-term baseline data set for MIS monitoring purposes.

All of the aquatic MIS data was collected from streams on the Manistee National Forest during 2012-2013. It is recommended that additional streams from the Huron National Forest be incorporated into long-term MIS monitoring. The following are streams that were previously identified as suitable candidates for this purpose (Table 14):

Table 14 Streams on the Huron National Forest that are Suitable Brook Trout and Mottled Sculpin Management Indicator Species (MIS) Locations.

	Location	
Stream	*Watershed*	*County*
Douglas Creek	Au Sable River	Crawford
Blockhouse Creek	Au Sable River	Oscoda
Ninemile Creek	Au Sable River	Oscoda
Hoppy Creek	Au Sable River	Alcona/Iosco
McDonald Creek	Au Sable River	Alcona
Roy Creek	Au Sable River	Alcona
Loud Creek	Au Sable River (PRVEL)	Alcona
Buck Creek	Tawas River	Iosco
Gordon Creek	Tawas River	Iosco
Loud Creek	Tawas River	Iosco
Indian Creek	Tawas River	Iosco
Vaughn Creek	Au Gres River	Iosco

Picture - Ruffed Grouse

Population Trends of Management Indicator Species

(MIS) Ruffed Grouse

What are the population trends of management indicator species? What are the relationships of the population trends to habitat changes? Are minimum viable populations of appropriate native and des irable non-native species being maintained within the planning area?

The 2006 Forest Plan identified six terrestrial wildlife species to serve as Management Indicator Species (MIS), including bald eagle, ruffed grouse, brook trout, mottled sculpin, Kirtland's warbler, and 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 should help assess how well we are maintaining habitat and viability of all species.

Monitoring Methods

For MIS, populations are estimated from drumming surveys, aerial surveys, track surveys, breeding bird surveys, nest counts, mark-recapture techniques or other survey methods. The Forests have collected monitoring data for a variety of habitat conditions and population trends for a few MIS. However, the Forests have inadequate staff or funding to effectively track or monitor all MIS, or relate their status to forest management.

Monitoring Results and Evaluation

This section will address monitoring of ruffed grouse and their habitat. Karner blue butterfly and Kirtland's warbler monitoring results are reported under Endangered or Threatened species. Bald eagle monitoring results are reported under Regional Forester Sensitive Species. In addition, we have worked with the Michigan Department of Natural Resources, the Little River Band of Ottawa Indians, universities and other groups to monitor and evaluate American marten, American woodcock, black bear, eastern pipistrelle, northern goshawk, and red-shouldered hawk, eastern box turtle, wood turtle, and sensitive plant species.

Ruffed grouse are monitored by spring drumming count surveys, by Forest staff, volunteers, and Tribal participants. Each route of 10 to 20 stops is run three times between mid-April and late May. The surveyor listens for drumming grouse at each stop, and records the number of drums heard. "Drums per stop" is the index of grouse drumming activity compared from route-to-route and year-to-year. HMNFs staff and volunteers monitor grouse drumming on nine routes (Table 15and

Table 16).

In 2012, grouse drumming per stop averaged 0.65, down slightly from 0.68 in 2011. In 2013, grouse drumming per stop averaged 0.63, down slightly from 2012.

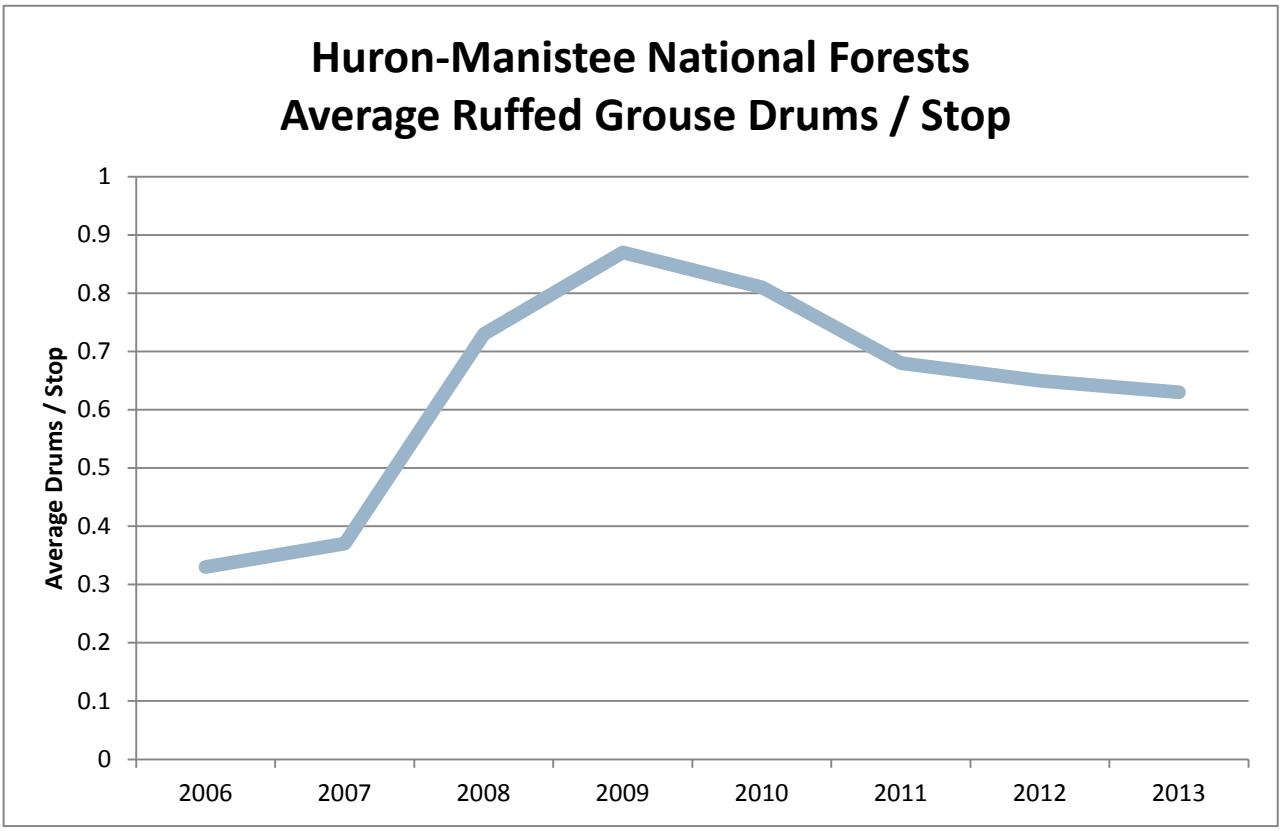
Table 15 Ruffed Grouse Drumming Count Results, 2012.

	Huron NF				Manistee NF					HMNF
Route	***Maltby Hills***	***Randall Meridian***	***Buhl***	***N. Black River***	***Grant Twp***	***Kellog Tower***	***Marilla***	***Pine River***	***Wagon Wheel***	***Overall***
Drums Heard	21	21	82	50	15	6	48	24	24	291
Stops	57	36	45	60	60	51	60	51	30	450
Drums / Stop	0.37	0.58	1.82	0.83	0.25	0.12	0.80	0.47	0.80	0.65

Table 16 Ruffed Grouse Drumming Count Results, 2013

	Huron NF				Manistee NF					HMNF
Route	***Maltby Hills***	***Randall Meridian***	***Buhl***	***N. Black River***	***Grant Twp***	***Kellog Tower***	***Marilla***	***Pine River***	***Wagon Wheel***	***Overall***
Drums Heard	14	28	59	38	25	14	63	42	11	294
Stops	57	54	45	60	60	51	60	51	30	468
Drums / Stop	0.25	0.52	1.31	0.63	0.41	0.27	1.05	0.82	0.37	0.63

Figure 2 Average Ruffed Grouse Drums per Stop.



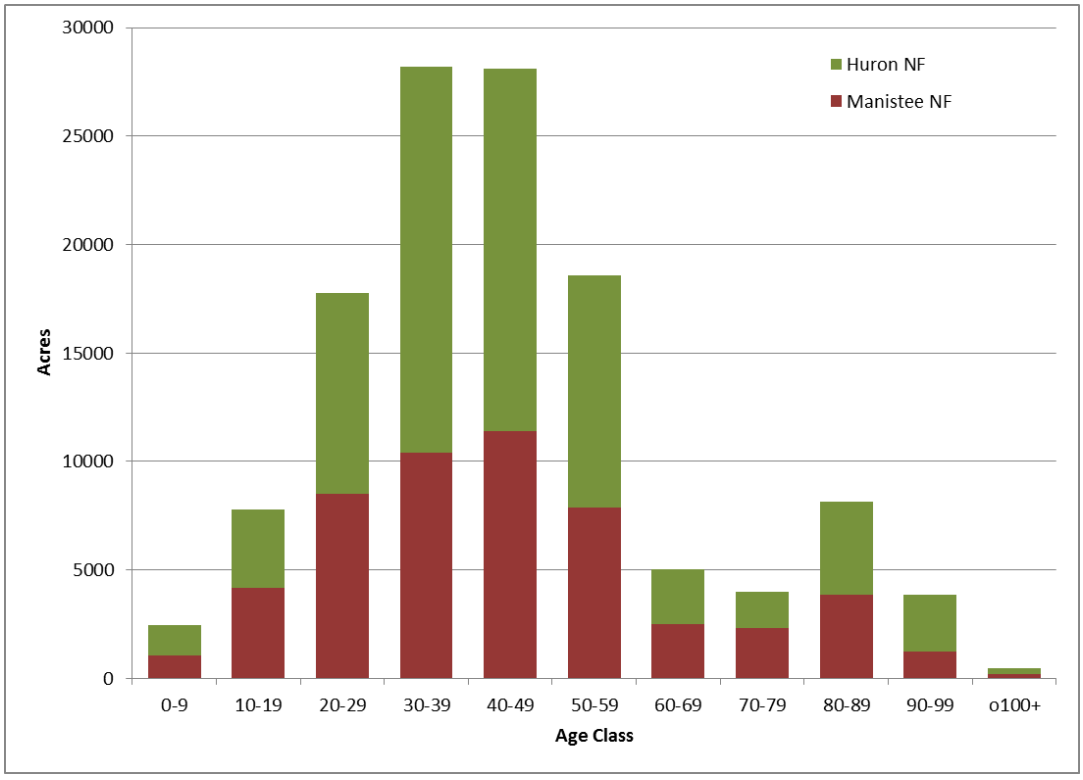
Variations in numbers of grouse drums heard, between areas and years, may be due to the well-known "ten-year cycle" in ruffed grouse numbers. Figure 2 Average Ruffed Grouse Drums per Stop.Figure 2 illustrates the average number of ruffed grouse drums per stop for the period 2006 to 2013. The graph suggests that the ruffed grouse population may be trending downward from the peak in 2009 toward the low phase of the ten-year cycle. However, a total of 291 and 294 ruffed grouse drums were heard on all routes in 2012 and 2013, respectively. This data suggests that the ruffed grouse population continues to be viable and healthy on the Huron-Manistee National Forests.

Existing information suggests that most forest vegetation type acres are consistent with 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.

Habitat and population objectives in the Forest Plan are to "maintain a minimum of 750 breeding pairs on the Huron National Forest and 1,000 breeding pairs on the Manistee National Forest. Two and one-half acres of zero to nine year old aspen adjacent to mature aspen will be maintained per breeding pair for a total of 1,875 acres on the Huron National Forest and 2,500 acres on the Manistee National Forest," or a total of 4,375 for the HMNF.

Current data indicates that only 2,470 acres exist in the 0-9 year old age class for aspen on all lands suitable for timber production on the HMNF. This is 56% of the minimum habitat objective. The age class distribution of aspen on the Huron and Manistee National Forests is displayed in Figure 3.

Figure 3 Current Age Class Distribution of Aspen on the Huron-Manistee National Forests (Lands Suited for Timber Production, LSC 500).



Recommendations

- ☑ Continue to monitor ruffed grouse by conducting drumming surveys on the routes established on each district.

- ☑ Increase management for early-successional habitats across the HMNFs to benefit ruffed grouse, woodcock, golden-winged warblers and other associated species.

- ☑ Develop aspen management objectives for each district based on Forest Plan objectives and how the aspen resource is distributed across the HMNFs.

- ☑ Emphasize regulated harvest of aspen to maintain a more even distribution of habitat in age classes 0-59, particularly in Grouse Management Areas.

- ☑ Identify opportunities for aspen management outside of Grouse Management Areas. Identify "aspen management areas" to allow for age-class regulation and better identify aspen management objectives (acres per decade).

Electro-shocking Fish

CHAPTER 2

Objectives, goals, standards & guidelines, & desired future conditions monitoring

Implementation of Standards and Guidelines – Fisheries Management

Are Standards and Guidelines, Goals, or Objectives being met?

Forestwide Standard

Forest management activities will not degrade long-term stream water quality below State standards.

Monitoring Methods

The Michigan Department of Environmental Quality (MDEQ) 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 MDEQ conducts surface water assessments on a statewide basis (by watershed) on a five-year schedule using the Great lakes Environmental Assessment "Procedure 51" (Michigan Department of Environmental Quality Water Bureau 2005). The focus is on water quality (habitat) and macro-invertebrate populations. Assessments were done on the following watersheds that the Huron-Manistee National Forests are part of during 2012-13: the White River and Au Sable River. However, the results from the 2012-2013 sampling are not yet available. Previous surface water assessments in these two watersheds indicated that water quality was good to excellent (Michigan Department of Environmental Quality 2008a; Michigan Department of Environmental Quality 2008b).

Monitoring Results and Evaluation

It is presumed the streams assessed in the White, and Au Sable River watersheds contained macro-invertebrate communities and habitat conditions consistent with good to excellent water quality. This presumption will be validated when the results of the 2012-13 sampling are published.

It is recommended that the Forest Service continue to use the MDEQ surface water assessments for monitoring of water quality.

Forestwide Goal – Manage Oligotrophic Lakes

Manage oligotrophic[6] 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.

Monitoring Methods

Lakes

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 Management Indicator Habitat (MIH) approach is being 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 under 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.

Lake water quality is a continuum progressing from very good to very poor conditions. A more precise method of describing the productivity of a lake is to use a numerical index which can be calculated directly from water quality data. A variety of indexes are available with Carlson's (1977) *Trophic State Index*, or TSI, being the most widely used.

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 lake water quality assessment (LWQA) program being jointly conducted by the Michigan DEQ and the USGS (Fuller and Minnerick 2008; Fuller et al. 2011). Table 17is a list of the lakes on the Huron-Manistee National Forests that are incorporated into this overall statewide monitoring program. The overall program is summarized at: http://mi.water.usgs.gov/splan1/sp00301/cmiinland.php.

[6] Oligotrophic – A water body that is lacking in plant nutrients and having a large amount of dissolved oxygen throughout.

Table 17 Lakes on the Huron-Manistee National Forests used for Management Indicator Habitat through the State-wide USGS-MDNR Lake Water Quality Assessment Program. The Data Represents the "Baseline" for Trophic Status for Forest Plan Monitoring.

Lake	National Forest	Watershed	County	Year	Carlson's TI Average1	Trophic Status 2
Island Lake	Huron	Au Sable	Oscoda	2004	36.406	Oligotrophic
Loon Lake	Huron	Au Sable	Oscoda	2004	34.931	Oligotrophic
Little Au Sable Lake	Huron	Au Sable	Ogemaw	2004	37.483	Oligotrophic
Sand Lake	Huron	Au Gres-Rifle	Iosco	2001, 2004	45.687	Mesotrophic
Mack Lake	Huron	Au Sable	Oscoda	2003	42.163	Mesotrophic
Sprinkler Lake	Huron	Au Sable	Alcona	2004	35.699	Oligotrophic
Wagner Lake	Huron	Au Sable	Oscoda	2004	36.937	Oligotrophic
Jewell Lake	Huron	Au Sable	Alcona	2002, 2003	41.928	Mesotrophic
Amaung Lake	Manistee	Pere Marquette	Newaygo	2003	34.752	Oligotrophic
Benton Lake	Manistee	White	Newaygo	2003	40.889	Mesotrophic
Hoags Lake	Manistee	Pere Marquette	Mason	2003	36.263	Oligotrophic
Nichols Lake	Manistee	White	Newaygo	2003	43.814	Mesotrophic
Round Lake	Manistee	Muskegon River	Mecosta	2006	46.511	Mesotrophic
Twinwood Lake	Manistee	Muskegon	Newaygo	2003	45.041	Mesotrophic
Pine Lake	Manistee	Manistee	Manistee	2004	48.164	Mesotrophic
Sand Lake	Manistee	Manistee	Manistee	2004	32.622	Oligotrophic

1TI = Trophic Index, a measure of the nutrient level of lakes as developed by Carlson (1977).
2 Trophic Index values < 40 = Oligotrophic, 40-50 = Mesotrophic, > 50 = Eutrophic (very productive) states

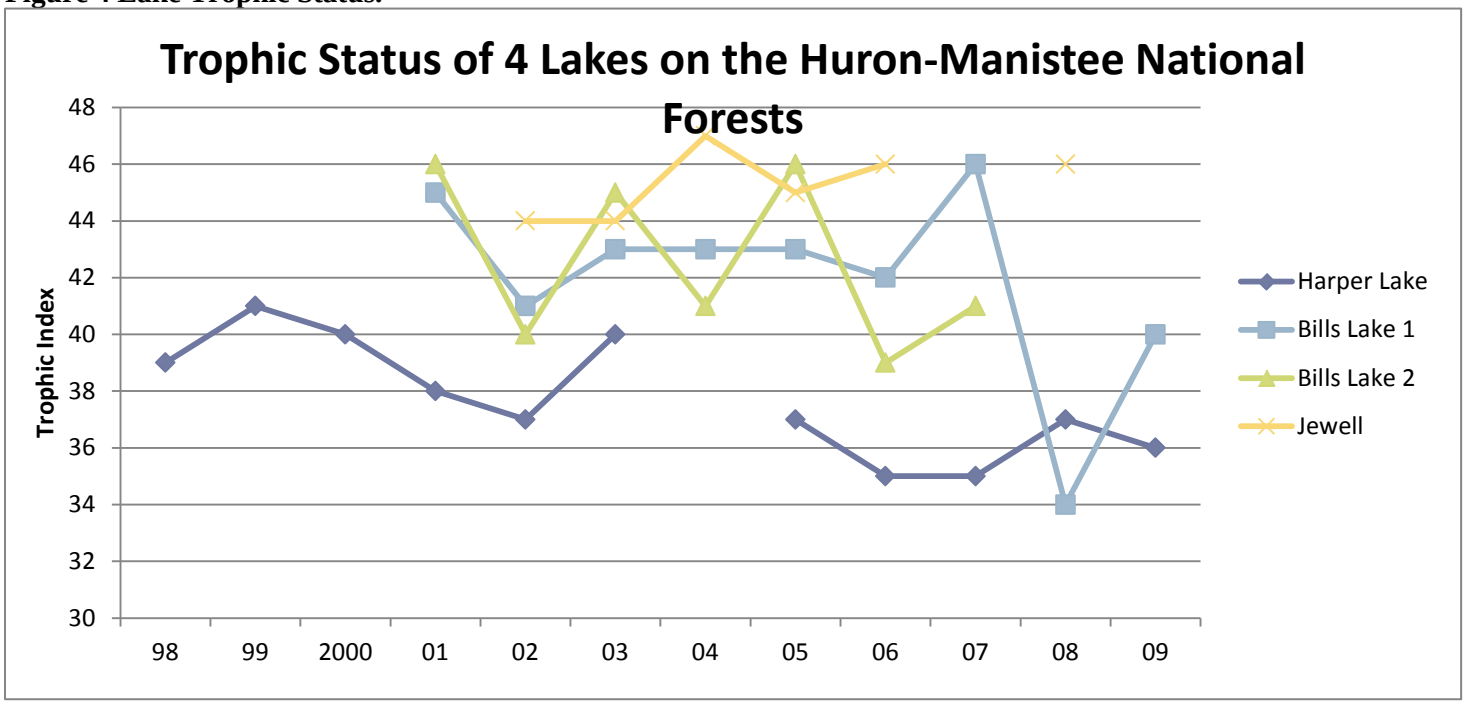
In addition to the joint MDEQ – USGS statewide lake water quality monitoring, the MDEQ also coordinates statewide citizen-based monitoring as part of their lake water quality assessment program. This program has been ongoing since the lake 1998 and reports are issued annually (Michigan Department of Environmental Quality and Michigan Lakes and Streams Association 1998-2009). Four lakes on the Huron-Manistee National Forests that have some National Forest ownership are part of this program: Harper Lake, Bills Lakes 1 and 2, and Jewell Lake.

Table 18. Cooperative Lakes Monitoring Program - Trophic Status of Lakes on Huron-Manistee National Forests (MDEQ Annual Summary Reports).1

Year	Harper Lake Lake Co.; Manistee NF	Bills Lake 1 Newaygo Co.; Manistee NF	Bills Lake 2 Newaygo Co.; Manistee NF	Jewell Alcona Co.; Huron NF
1998	39			
1999	41			
2000	40			
2001	38	45	46	
2002	37	41	40	44
2003	40	43	45	44
2004		43	41	47
2005	37	43	46	45
2006	35	42	39	46
2007	35	46	41	
2008	37	34	--	46
2009	36	40	--	--
2006-2009 Average	***35.75***	***40.5***	***40***	***46***

1TI = Trophic Index, a measure of the nutrient level of lakes as developed by Carlson (1977).

Figure 4 Lake Trophic Status.



Evaluation and Conclusions

No lakes on the Huron-Manistee National Forests were sampled in 2012-13 as part of the state-wide USGS-MDEQ lake water quality assessment. However, given the fact that the trophic index remained in the same category from 1990-2009 ("mesotrophic" or moderately productive), it is presumed that lake trophic status is being maintained (no eutrophication).

Recommendations

It is recommended to continue to use the Michigan Department of Environmental Quality's statewide lakes water quality assessment program to monitor the trophic status of lakes on the National Forests.

Forestwide Guideline – Natural in-stream or Added Wood Trees

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.

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.

Monitoring Methods

Coordination with primary river users (liveries, commercial outfitter guides) to balance navigational clearing with aquatic habitat maintenance.

Monitoring Results and Evaluation

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 in 2006.

Recommendations

Continuation of this effort helps to mitigate the potential cumulative effects of long-term clearing.

Brush Lake

Fisheries Management

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?

Forest-wide Goal – Wildlife and Fisheries Habitats and Plant Communities

Wildlife and fisheries habitats and plant communities shall be managed to maintain viable populations of existing native and desired non-native species.

Monitoring Methods

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, slipershell, and creek heelsplitter mussels). Stream habitat work included streambank stabilization, instream cover structure construction and repair, improvement of road-stream crossings, and large wood enhancement. Partnerships continued to be the foundation of the implementation of our fisheries and watershed restoration programs during 2012-13.

Notable partnership projects within the major respective watersheds on the Huron-Manistee National Forests were over 2012-13 included:

- ☑ Great Lakes Restoration Initiative – replacement of culverts that were impeding aquatic organism passage (North Branch Au Sable River watershed, White River watershed, Manistee River watershed).
- ☑ Manistee River lake sturgeon restoration (Little River Band of Ottawa Indians)

Evaluation and Conclusions

Implementation of Forest Plan objectives for fish habitat and watershed restoration is being met.

Forest Plan Desired Future Condition – Stream Restoration

Stream restoration of large wood to meet the desired future conditions (54 – 108 pieces per mile in large streams, 108 – 160 pieces per mile in smaller streams).

Monitoring Methods

Monitoring of large wood abundance in streams on the Huron-Manistee National Forests was not conducted in 2012-2013.

Monitoring Results and Evaluation

Numerical counts of large wood abundance should be undertaken on representative streams on the National Forests to determine baseline conditions in these streams as part of large wood restoration proposals.

Picture - American Pine Marten

Implementation of Standards and Guidelines — Regional Forester Sensitive Species (RFSS)

Are management Standards and Guidelines being implemented for RFSS or their habitats?

The Huron-Manistee National Forests (HMNFs) implement vegetation management projects and structural habitat improvements that benefit Regional Forester Sensitive Species (RFSS). The HMNFs also prescribe and implement site-specific protection measures for RFSS when they are known or expected to occur within project areas.

Standards and Guidelines for Regional Forester's Sensitive Species can be found on pages II-29 to II-31 of the Forests' Plan.

Common Loon

Common loons breed on a number of lakes on the HMNFs. Table 19display the water bodies that have breeding loon and their success at raising young.

Table 19 Lakes where common loons have been observed.

Waterbody	District	# Pairs	Young Fledged	
			2012	2013
Nichols Lake	Baldwin-White Cloud	1	UNK	UNK
Brooks Lake	Baldwin-White Cloud	1	UNK	UNK
Pettit Lake	Baldwin-White Cloud	1	UNK	UNK
Olga Lake	Cadillac-Manistee	1	0	1
Gun Lake	Cadillac-Manistee	1	2	2

Waterbody	District	# Pairs	Young Fledged	
Wakeley Lake	Mio	1	1	UNK
Loon Lake	Mio	1	1	UNK
O'Brien Lake	Mio	0	-	-
Sprinkler Lake	Huron Shores	1	Y	Y
Cooke Pond	Huron Shores	2	Y	Y
Loud Pond	Huron Shores	1	Y	Y
Bliss Lake	Huron Shores	1	0	0

UNK = unknown

Biologists manage lakes with known loon populations by ensuring high quality habitat is available and using Forest Supervisor's closure orders to protect nesting loons. Loon nesting success is generally monitored annually and the data entered into the NRIS Wildlife database.

The population of common loons on the HMNFs is stable or improving. Nevertheless, some human activities continue to adversely impact individuals and nesting success.

Eastern Massasauga

The eastern massasauga rattlesnake is a Federal candidate species. Candidate species are those species for which the Service has sufficient information on their biological status and threats to propose them as endangered or threatened.

The Forest Plan includes a guideline to implement the Management Recommendations for the Eastern Massasauga Rattlesnake on the Huron-Manistee National Forests (also known as the Massasauga Conservation Approach). A *Conservation Approach for Eastern Massasauga* was completed for the Huron-Manistee National Forests in 2002. This document compiled the published and unpublished information for the eastern massasauga, identifies eastern massasauga management units and provides specific recommendations for managing eastern massasaugas and their habitat on the HMNFs (pages 25-31).

Despite a number of search efforts in recent years, the eastern massasauga is seldom documented on the HMNFs, partly because it is difficult to detect and it is likely that it is not as common as it once was due to human persecution.

No surveys or occurrences were recorded in the NRIS Wildlife database for 2012 and 2013

Northern Goshawk and Red-shouldered Hawk

The HMNFs routinely implement the *Management Recommendations for the Northern Goshawk on the Huron-Manistee National Forests* (USDA-Forest Service1993). These recommendations are intended to help protect northern goshawks, red-shouldered hawks and manage their breeding habitats. In 2013, the HMNFs established an interdisciplinary team to review and revise these recommendations, incorporating the most recent information related to northern goshawks. The team anticipates completing this task early in FY2015.

Pre-NEPA surveys for northern goshawks are conducted every year. These surveys follow an established protocol and identify goshawk breeding areas so that mitigation measures can be incorporated into project designs. In addition, known goshawk nest sites are monitored annually.

In 2012, eight northern goshawk occurrences were recorded in the NRIS Wildlife database, and in 2013, four were recorded. In 2012, five surveys were recorded in the database, and in 2013, 26 surveys were recorded

Overall, northern goshawk and red-shouldered hawk populations appear to be steady or increasing. Improved data stewardship would help to verify population trends over the long term.

In FY2013, the HMNFs formed an interdisciplinary team to review the Forests' Goshawk Management Guidelines. The guidelines have been updated and rewritten and should be finalized in early FY2015.

American Marten

American marten have only been documented on the Manistee National Forest. These animals are present due to a reintroduction that occurred in 1986. Marten surveys have been conducted on the Huron National Forest, but none have been found. Based on recent survey and distribution information , the population of American martens on the Manistee National Forest appears to be stable or increasing.

The HMNFs have partnered with the Little River Band of the Ottawa Indians (LRBOI) and Grand Valley State University (GVSU) to conduct a radio telemetry study to determine marten habitat use. To date, the study has generated data that has and will be useful for managing marten habitat. The primary investigator, Bob Sanders expects to publish his research findings in 2014. LRBOI and GVSU have shared preliminary data with the HMNFs, allowing the Forests to create an interim marten habitat map that will assist in habitat management decisions.

Projects on the Manistee National Forests routinely incorporate mitigation measures for provide for quality American marten habitat. The *American Marten Conservation Strategy for the Huron-Manistee National Forests* (1996) provides habitat management guidance. This document is planned to be revised in 2015 or 2016, and will incorporate the latest information.

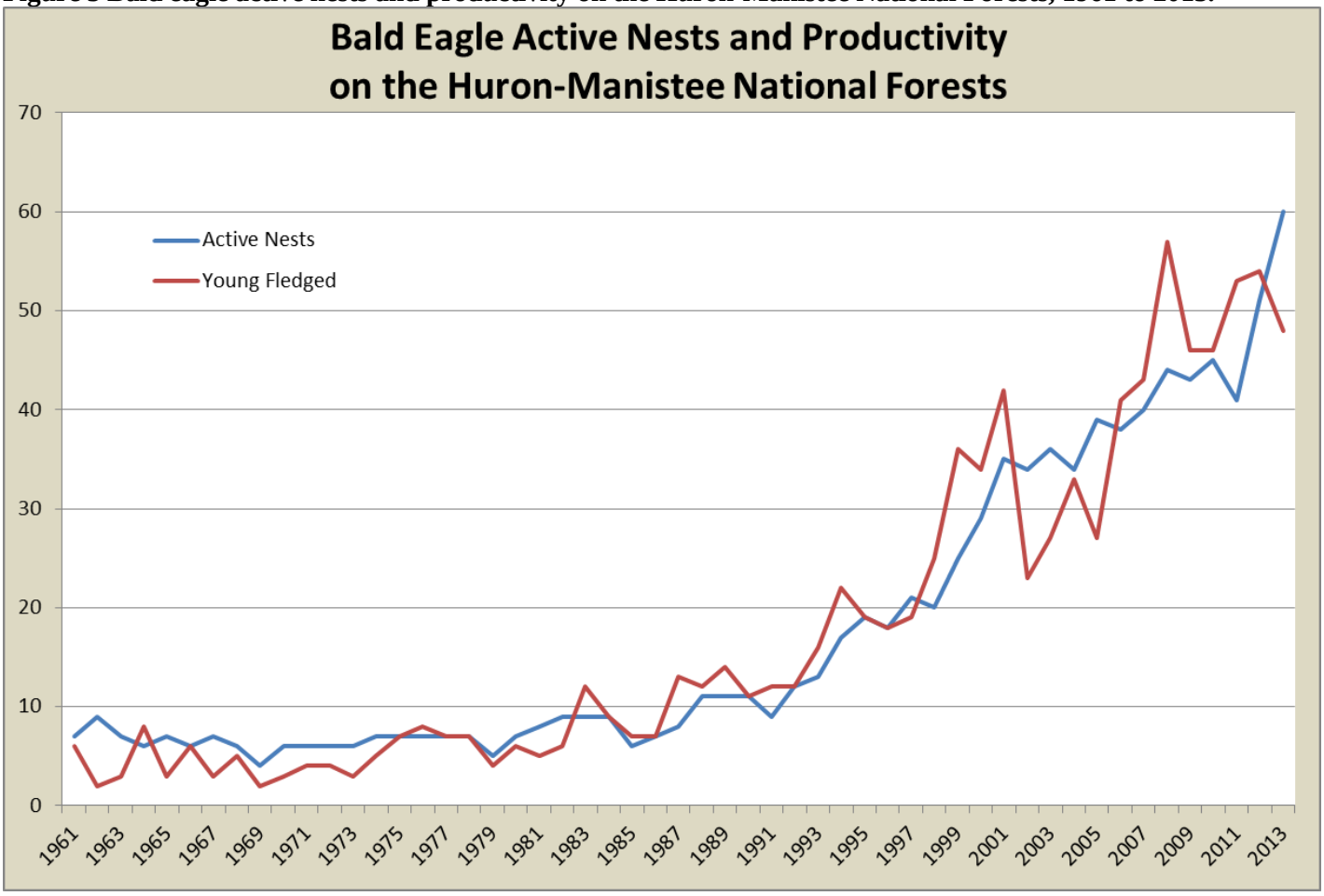
Bald Eagle

Since the Forest Plan was revised in 2006, the bald eagle has been removed from the federal list of threatened species. The bald eagle is now a Regional Forester's Sensitive Species, and is still federally protected by The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940. Forest Service biologists determine impact of projects on bald eagles by consulting the US Fish and Wildlife Service's Eagle Permits website. Mitigations measures are routinely incorporated into project design, and typically follow the recommendations in the HMNF's Bald Eagle Management Plan.

Bald eagle nesting territories are typically closed to human entry under a Forest Supervisor's closure order during the breeding season, February 1 to July 15.

Bald eagle nests and productivity are monitored annually by the Michigan Department of Natural Resources. Survey results from recent years show a steadily expanding population on the HMNFs and throughout the Lower Peninsula of Michigan (Figure 5).

Figure 5 Bald eagle active nests and productivity on the Huron-Manistee National Forests, 1961 to 2013.



RFSS Plants

The HMNFs are following the standards and guidelines for ternate grape fern, American ginseng, northern wild comfrey, yellow- ladies' tresses, and pine drops.

Ternate Grapefern

There are over 100 documented occurrences of ternate grape fern on the Cadillac-Manistee Ranger District. These occurrences are not being monitored due to lack of funding, personnel and time. Multiple locations of ternate Grapefern occur on the Baldwin-White Cloud Ranger District. Only one population, at Loda Lake, has been monitored. This population has been doing well.

American Ginseng

There are very few occurrences on the HMNFs. Some have been revisited within the past three years. If ginseng is found within or adjacent to stands proposed for treatment, the stands are typically not treated to avoid adverse impacts to the species.

Northern Wild Comfrey

There are very few occurrences on the HMNFs, but the species occurs on both the Huron and Manistee National Forests. Two new populations were discovered in 2013. One population was recorded in 2012.

Yellow Ladies' Tresses

There are very few occurrences of this species on the HMNFs. One population was found in 2008 in a proposed treatment area that was subsequently dropped from treatment. This population has not been monitored. Another population was discovered in 2002, but has not been monitored.

Pine drops

There are very few occurrences of this species on the HMNFs. One occurrence that has been revisited, but no individuals were found.

Recommendations

- ☑ Common Loon - Ensure local lakes are monitored annually for common loon presence and nesting success. Enter the survey and observation data into the NRIS Wildlife database, even if no loons are observed.

- ☑ Eastern Massasauga – Continue to survey for eastern massasaugas in proposed project areas and historic locations as noted in the Conservation Approach. Current distribution information is needed to ensure conservation of this species and its habitat. Record survey efforts and observations in the NRIS Wildlife database. Ensure conservation measures are incorporated into project design.

- ☑ Northern Goshawk and Red-shouldered Hawk – Continue to survey for northern goshawks and red-shouldered hawks in proposed project areas. Ensure current conservation measures are incorporated into project design. Monitor active nesting areas annually. Complete the revision of the northern goshawk guidelines to incorporate new information.

- ☑ American Marten – Continue to partner with LRBOI and GVSU to monitor marten habitat use. Incorporate new information into conservation measure for proposed projects. Search for martens outside known habitats using remote cameras and track surveys; update the marten habitat map as necessary. Revise the 1996 Marten Conservation Strategy for the HMNF to incorporate new information and conservation measures.

- ☑ Bald Eagle – Continue to protect bald eagle nest sites during the breeding season according to the HMNF's Bald Eagle Management Plan, or in accordance with the USFWS eagle permit website. Continue to incorporate conservation measures into project design. Continue to cooperate with the MDNR to survey for bald eagle nests and monitor productivity on the HMNFs.

- ☑ RFSS Plants – Continue to incorporate conservation measures for RFSS into proposed projects where possible. Develop a schedule to monitor occurrences of less common RFSS plant species at least every five to ten years.

Sturgeon

Population Trends of Regional Forester Sensitive Species (RFSS)

Lake Sturgeon, Greater Redhorse, and Channel Darter, Creek Heelsplitter, and Snuffbox

To what extent are habitat conditions for RFSS aquatic species being maintained or improved? RFSS include seven fish, two mussels, and one insect.

Monitoring Methods

Monitoring will determine the change in RFSS populations over time. Obtain population and habitat data from MDNR, USFWS, Tribes, MNFI, and USFS sources. Calculate population and habitat trends for species. Suitable habitat is explicitly defined for each species through the Species Viability Evaluation (SVE) process.

Lake Sturgeon (State-threatened, RFSS)

The Manistee River historically supported a large population of lake sturgeon (Acipenser fulvescens). 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. Baseline population metrics were identified during 2000-2005. Lake sturgeon telemetry studies (Yeomans 2002) identified spawning areas. Sturgeon appeared to use two different spawning sites. Peterson et al. (2002) and Lallaman et al. (2008) found that Manistee River spawning population ranged from 21 to 66. Successful reproduction and recruitment was documented by Chiotti et al. (2008).

Lake sturgeon monitoring on the Manistee River over the period 2006-2011 was a cooperative effort led by the Little River Band of Ottawa Indians Natural Resources Department. Other cooperators in the Manistee River lake sturgeon recovery efforts include the U.S. Fish and Wildlife Service, Michigan Department of Natural Resources, U.S. Forest Service, Central Michigan University, and Michigan Technological University. Monitoring focused on larval sturgeon drift and young-of-the-year recruitment. The Little River Band of Ottawa Indians captured between 36 and 542 larvae each year for the period 2002-2008.

In addition, the Little River Band operates a streamside rearing facility at Rainbow Bend Recreation Area on the Manistee River (Holtgren et al. 2007). Larval wild sturgeon are captured from the Manistee River and placed in the rearing facility. In the fall, these fish are released back into the stream. Over the period 2012-12, approximately 350 juvenile sturgeon in the 6-8-inch range were released. It is believed that this life stage is one

of the most critical in the lake sturgeon life cycle. The streamside rearing unit allows for juveniles to reach a larger size more quickly than would be attained in the river alone, thus enhancing their chances for survival.

The Muskegon River, another Lake Michigan tributary that adjoins the southern part of the Manistee National Forest, also supports a remnant lake sturgeon population (O'Neal 1997; Peterson and Vecsei 2004). Cooperative monitoring by Grand Valley State University and the Michigan Department of Natural Resources in 2008-2011 captured 57 adult and 44 juvenile in this river system. Spawning was also observed spawning. Larval lake sturgeon were also encountered, documenting successful reproduction and recruitment. This research suggests that successful spawning by lake sturgeon occurs in the Muskegon River and that juvenile lake sturgeon utilize Muskegon Lake as a nursery habitat before entering Lake Michigan (Altenritter et al. 2010; Comben et al. 2011; Wieten et al. 2011).

Greater Redhorse (State-threatened, RFSS)

The greater redhorse sucker, *Moxostoma valenciennesi,* has been documented to occur in the Pere Marquette, White, Muskegon, and Au Sable Rivers within the Huron-Manistee National Forests (Michigan DNR Fish Atlas spatial library; Lansing, MI). The U.S. Fish and Wildlife Service operated an electrical sea lamprey barrier with a fish ladder on the Pere Marquette River in cooperation with the Michigan Department of Natural Resources from 2003-2009. This fish ladder provided an opportunity to monitor fish passage. U.S. Forest Service personnel sampled fish passage through the ladder in 2008 and 2009. A total of 684 and 980 redhorse suckers were passed through the fish ladder, respectively, during these years, with the majority being golden and silver redhorse suckers. Twenty-one (21) greater redhorse suckers were encountered in 2009. The weir and fish ladder ceased operation in 2010; thus, no greater redhorse sampling was done in 2012-13.

One other occurrence of the greater redhorse sucker within the boundaries of the Huron-Manistee National Forests was documented in 2011. Greater redhorse were captured in Tippy Dam hydro-electric impoundment on the Manistee River during a Michigan Department of Natural Resources fisheries survey (Tonello 2012). Twenty five (25) individuals were captured during the survey (5 % of the total catch).

Channel Darter (State-endangered; RFSS)

The channel darter, Percina copelandi, has been documented to occur in the Au Sable and Pine river – Van Etten Lake River systems on the Huron National Forest (Michigan DNR Fish Atlas spatial library; Lansing, MI). A survey by Schultz (1986) re-confirmed its occurrence in the Pine River – Van Etten Lake system. Follow-up surveys in 2000-2001 verified its continued presence (Thompson et al. 2001). The most recent monitoring was done in 2007. Channel darters are still present in the Pine River system; however, only at one of the three sites where found in 2000 (Schnurer and Stuber 2007).

Creek Heelsplitter (RFSS), Slippershell, and Snuffbox (Fed-endangered) Mussels

The creek heelsplitter, Lasmigona compressa, is a freshwater mussel that occurs in the Pere Marquette River system (Badra 2004). It was also found in the Au Sable River in 2012-13 (Chambers 2013). Chambers (2013) also found the slipershell mussel, Alasmidonta viridis, another sensitive mussel species in the 2012-13 surveys of the Au Sable River. The federally endangered snuffbox mussel, Epioblasma triquerta, has no documented occurrences on the Huron-Manistee National Forests. However, the Forests lie within its native range, and its host fish, the northern logperch (Percina caprodes semifasciata), occurs in the Au Sable, Manistee, Pere Marquette, White and Muskegon River systems.

Monitoring Results and Recommendations

The lake sturgeon population in both the Manistee and Muskegon Rivers remain low but some natural reproduction and recruitment is occurring. This is encouraging, especially when viewed from a statewide perspective. Although lake sturgeon 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 of lake sturgeon in both of these rivers are a significant part of the overall restoration program. Monitoring relative recruitment indices and spawning habitat will aide cooperators in the continued restoration of the Manistee and Muskegon River sturgeon population.

Greater redhorse suckers are still presumed to be present in the Pere Marquette River system given their documented occurrences while the lamprey weir and fish way was being operated from 2006-2010. However, with this system no longer being operational, another mechanism will need to be employed to monitor redhorse suckers in this river system. Monitoring of populations in the Au Sable River and Manistee River should also be undertaken given its documented occurrences in recent years. Utilization of the Michigan Department of Natural Resources periodic survey data (e.g., “Status of the Fishery Reports”) is recommended.

Monitoring of channel darter populations in the Pine River – Van Etten Lake watershed should be undertaken in the future.

Monitoring for the snuffbox, slippershell and creek heelsplitter mussels needs to be undertaken in the future. Sampling as described by Chambers (2013) should be continued.

Hatchling Piping Plover

Endangered and Threatened Species — Conservation Strategies / Population Trends Piping Plover, Indiana Bat, Karner Blue Butterfly, Pitcher’s Thistle and Kirtland’s Warbler

To what extent are established recovery or conservation strategies for species listed under the Endangered Species Act being implemented? What are the population trends for piping plover, Pitcher's thistle, Kirtland's warbler, Karner blue butterfly and Indiana bat?

The Forest Plan provides management guidance for implementing recovery and conservation strategies for species listed under the Endangered Species Act. The Huron-Manistee National Forests prepared a programmatic biological assessment and consulted with the US Fish and Wildlife

Service (FWS) during the Forest Plan revision process. The FWS prepared the Programmatic Biological Opinion for the Revised

Huron-Manistee National Forests Land and Resource Management Plan (USFWS 2006). This document discusses the effects of the Forest Plan on the Great Lakes piping plover (*Charadrius melodus*) and piping plover designated critical habitat, Indiana bat (*Myotis sodalis*), Karner blue butterfly (*Lycaeides Melissa samuelis*), Pitcher's thistle (*Cirsium pitcheri*), bald eagle (*Haliaeetus leucocephalus*), and Kirtland's warbler (*Setophaga kirtlandii*). Conservation strategies for these species are incorporated into the Forest Plan's standard and guidelines (Table 20).

Table 20 Endangered, Threatened, and Sensitive Species (ETS) and Conservation Strategies.

ETS	Recovery or Conservation Strategy
Piping Plover	The Recovery Plan for the Great Lakes Piping Plover (USFWS 2003)
Indiana Bat	The Indiana Bat Recovery Plan (USFWS, 1983) and an updated agency (USFWS) draft plan (1999)
Karner Blue Butterfly	The Karner Blue Butterfly Recovery Plan (USFWS, 2003)
Pitcher's Thistle	Pitcher's Thistle Recovery Plan - draft (USFWS, 1993)
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 2012)

Below is a discussion of how recovery and conservation strategies are being implemented for these species.

Conservation Strategies

Piping Plover

The 2012 and 2013 Great Lakes Piping Plover Monitoring Reports summarize the Forests' activities, accomplishments and findings for this species.

HMNF personnel participated in FWS coordination and training meetings, assisted City of Manistee personnel with nest monitoring, and conducted visitor regulation enforcement within Critical Habitat.

The Forest monitors compliance with area closures and requirements for leashed pets to comply with FWS requirements. Heavy recreational use is likely to impact piping plover breeding activities, but actual effects are unknown. Unleashed pets are considered to be a rising concern, and the mere presence of pets (leashed or unleashed) in potential nesting areas may have a negative impact on plover nesting. Wilderness Forest Protection Officers estimate one in ten groups visiting the Wilderness Area has dogs, and these dogs are rarely leashed. Areas immediate to the LMRA Campground are more accessible, and see considerably more use, with dogs commonly seen on the beach. Educating visitors regarding leash policy and biology of the plovers has been the major form of enforcement when unleashed pets are encountered. This approach is considered mildly effective, and law enforcement officials contact dog owners whenever possible, to warn them about leash rules and potential threats to sensitive shoreline species.

The 2012 and 2013 survey seasons documented typical recreation use. Dog use in these years remained similar to previous years. Verbal warnings were given to achieve compliance, but no tickets or written warnings were issued in 2012 or 2013 (Table 21).

Table 21 Recreational use over time during piping plover surveys by HMNF Forest employees in Nordhouse Dunes WIlderness and LMRA.

	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		
2006	319	19	16	1
2007	232	28	21	0
2008	371	16	6	0
2009	162	20	7	0
2010**	888	67	39	0
2011	196	8	11	0
2012	414	24	29	0
2013	340	23	9	0

nr verbal high use zone swim areas ared ored ating nest.lts from their inception in 2001 to present. Additionally, this document/a = data not available
*** June 28, 2010 initiated daily nest monitoring (weather permitting) instead of typical biweekly surveys.*

Ludington State Park does not allow dogs in beach areas, and this could be a reason that LSP is having nesting success. Similar areas of critical habitat on the HMNF were not utilized.

Gulls, which will predate piping plover eggs and chicks, are present in large numbers in NDW, LMRA, and LSP. Additional avian predators included the observation of bald eagles, crows and merlin. Mammalian predator tracks such as coyote and otter were often observed during the 2012 and 2013 surveys.

Fluctuation in amounts of cobble bed along the shoreline is also a concern, but is largely influenced by factors out of agency control, such as Lake Michigan water levels and weather.

Indiana Bat

The Forests complied with all Terms and Conditions set forth for Indiana bat in the Biological Opinion, including enforcing timing restrictions and smoke dispersal requirements within the Tippy Dam Management Zone. The Forests maintained optimal summer maternity habitat for Indiana bat under all vegetative treatments, including prescribed burning. Prescribed burns, conducted within potential Indiana bat range outside restricted Indiana bat timeframes, are not considered to be within or affecting optimal Indiana bat habitat. Potential and existing bat roost trees and watering areas were protected as required by the Forest Plan.

All Forest Service employees, contractors and volunteers working within Indiana bat habitat were educated to recognize and avoid potential Indiana bat roost trees and the required habitat components for a complete Indiana bat home range.

Karner Blue Butterfly (KBB)

The 2012 and 2013 Karner Blue Butterfly Monitoring Reports summarize the Forests' activities, accomplishments and findings for this species.

The Huron-Manistee National Forests identified approximately 7,332 acres of habitat restoration in metapopulations and essential KBB savanna and barrens habitat during the first decade, or an average of 733 acres per year. Habitat restoration occurs only after implementing a number of treatments over many years. While many treatments have occurred to restore habitat since 2006, no information is currently available on how many acres of restoration have been complete each year since 2006. The KBB biologist hopes to develop a table that displays how many acres are in each stage of the savanna conversion process.

In 2012, the HMNFs conducted treatments on 724.5 acres including: planting nectar plugs on 67 acres; hand cutting 147 acres; harvesting timber on 83 acres; mechanically preparing and seeding 16 acres; reducing overstory and understory woody cover on 48 acres using a bulldozer, sheer cutter, or masticator; removing non-native invasive species and other undesirable vegetation on 56.5 acres; and protecting 307 acres of Karner blue butterfly habitat.

In 2013, the HMNFs conducted treatments on 963.6 acres including: planting and weeding nectar plugs on 87.2 acres; weeding 25.0 acres of seed plots; hand cutting 34.0 acres; harvesting timber on 121.0 acres; tilling and seeding 18.1 acres; reducing overstory and understory woody cover on 373.0 acres via growing season burns; applying herbicide on 5.0 acres to remove non-native invasive species; and protecting 300.3 acres of Karner blue butterfly habitat.

The objective of these treatments is to reduce tree and shrub density, protect savanna remnants, and promote growth of native grasses and wildflowers, including wild lupine – the sole food for the Karner blue butterfly caterpillar.

Pitcher's Thistle

In 2012, four non-native invasive plant species were treated along the Lake Michigan shoreline to prevent them from negatively impacting Pitcher's thistle habitat. Spotted knapweed (*Centaurea stoebe*), Houndstongue (*Cynoglossum officinale*), Japanese barberry (*Berberis thunbergii*), and Lombardy poplar (*Populus nigra*) were treated multiple times for a total of 414 acres of treatments.

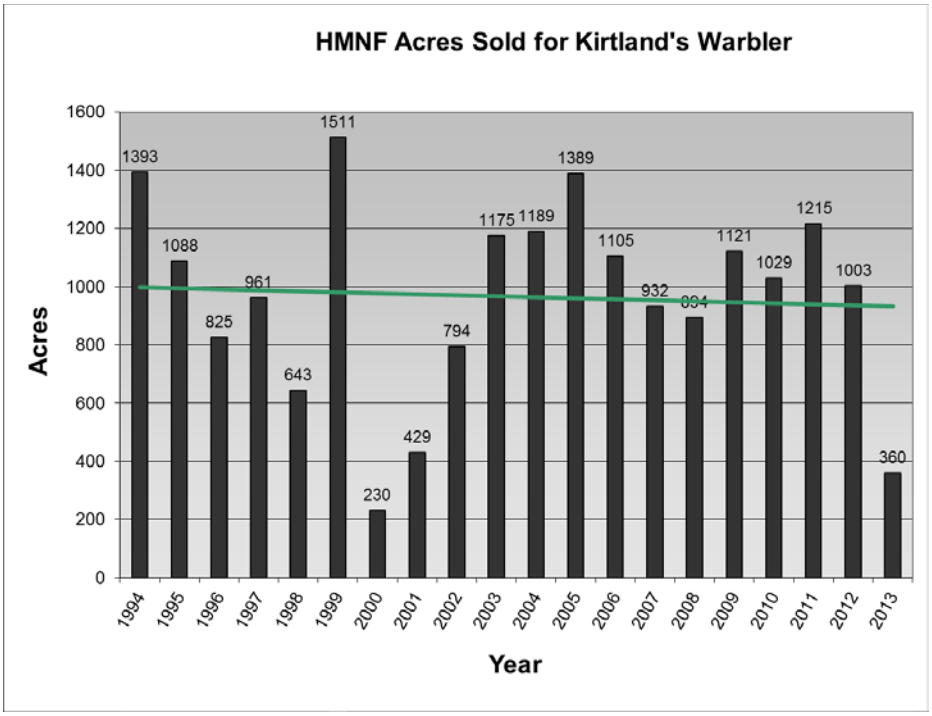
Of those acres, 254 were in the Nordhouse Dunes Wilderness Are and 160 acres were in the Lake Michigan Recreation Area.

Kirtland's Warbler (KW)

In 2012, the Forests sold 1,003 acres of jack pine (63 percent of the Forest Plan's annual objective of 1,600 acres per year). In 2012, 1,697 acres of essential habitat were counted as reforested to jack pine. However, 500 acres of this total includes estimate natural regeneration from the Little Mack Lake Fire. All Kirtland's warbler timber sales offered by the Forest Service were sold. The Little Mack Lake Fire burned approximately 820 acres of KW essential habitat in the Mack Lake Kirtland's Warbler Management Area; approximately 500 acres of this burn area is expected to regenerate to KW breeding habitat. No large wildfires occurred in areas outside of essential habitat that would produce future breeding habitat.

In 2013, the Forests only sold 360 acres of jack pine (23 percent of the Forest Plan's annual objective of 1,600 acres per year). In 2013, 928 acres of essential habitat were counted as reforested to jack pine. All Kirtland's warbler timber sales offered by the Forest Service were sold. No large wildfires occurred within or outside of essential habitat that would produce future breeding habitat.

Figure 6 Acres sold to develop Kirtland's warbler breeding habitat on the Huron-Manistee National Forests over a 20-year period.



In FY2012 and 2013, the HMNFs worked with the Michigan Department of Natural Resource (MDNR) and US Fish and Wildlife Service (USFWS) to finish a draft of the Kirtland's Warbler Breeding Range Conservation Plan. The primary purpose of the Plan is to provide strategic guidance to the MDNR, USFS, and the USFWS to sustain the Kirtland's warbler across its breeding range within an ecosystem management framework. The Plan is expected to be finalized in FY2014.

Population Trends

Piping Plover

The 2012 and 2013 Great Lakes Piping Plover Monitoring Reports summarizes the findings for this species. Monitoring efforts for the piping plover focused on the 4.6 miles of Lake Michigan shoreline on NFSL that meets the critical habitat designations delineated in 2001 by the USFWS. No piping plovers nested on the Huron-Manistee National Forests in 2012. In 2013 one plover was observed on HMNF, no nests were observed.

In 2012, critical habitat on Huron-Manistee National Forests was monitored for the occurrence of piping plovers. Three employees conducted 24 surveys in Nordhouse Dunes Wilderness Area and 12 surveys in Lake Michigan Recreation Area between April 13 and July 20, 2012. One individual piping plover was sighted on HMNF lands and tracks of foraging birds were documented throughout the season.

In 2013, critical habitat on Huron-Manistee National Forests was monitored. Five HMNF employees conducted 19 total surveys on the HMNF in Nordhouse Dunes Wilderness, LMRA, and the Cooper Creek area. These surveys occurred between April 29 and July 30, 2013. One piping plover was sighted in Nordhouse Dunes Wilderness in mid-July towards the end of the season. Piping plover tracks were observed in the same vicinity on two subsequent visits; however, no additional piping plovers were observed.

Indiana Bat

No specific Indiana bat surveys were conducted in 2012 and 2013. Forest staff conducted repeated acoustical surveys of five transects during June and July in Lake, Manistee, Newaygo and Wexford counties, and special surveys of the Tippy Dam (hibernaculum) area during fall swarming. The recordings will be analyzed to determine if Indiana bats were among the species detected. These surveys are intended to provide baseline population indices and to monitor the potential effects of White-nose Syndrome on the relative number of bats on the Huron-Manistee National Forests.

In 2012, Dr. Allen Kurta reported approximately 24,000 bats in Tippy Dam, with no evidence of white-nose syndrome. No mention was made of Indiana bats. However, based on previous surveys, one can assume that a very small number of Indiana bats were present in the hibernaculum.

Karner Blue Butterfly (KBB)

The 2012 and 2013 Karner Blue Butterfly Monitoring Reports contain detailed information on population trends.

In 2012, 929 acres were monitored on the Manistee National Forest to assess KBB population status and treatment effectiveness. KBB occupied 38 of the 63 subpopulations monitored in 2012. 476 KBB were observed within these 63 subpopulations.

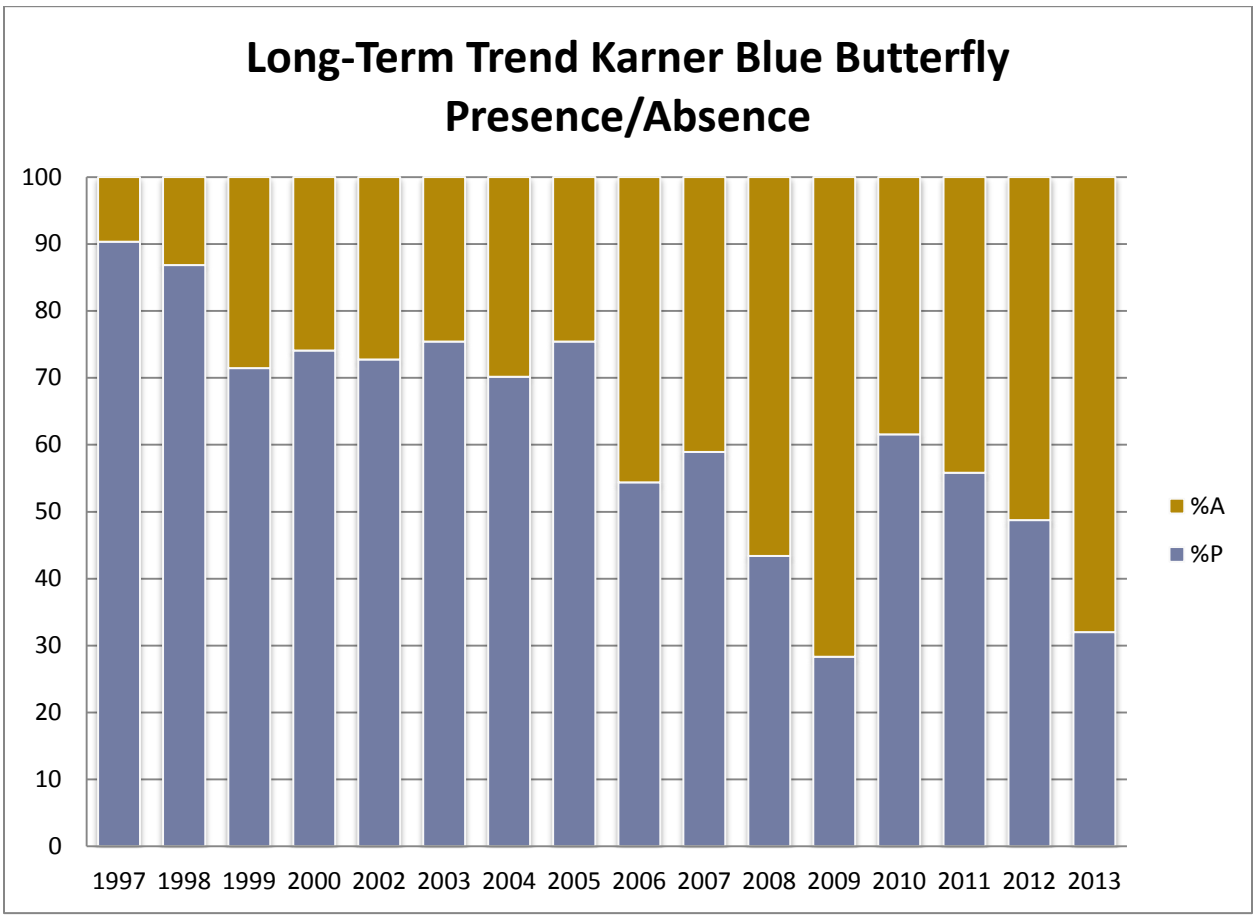
No occupied KBB subpopulations are known to occur within the Brohman metapopulation area. Because KBB may be extirpated from the Brohman metapopulation area, a new management area is proposed to be designated around the Hayes subpopulation. Two viable KBB metapopulations are planned to be developed within the Bigelow and Hayes metapopulation areas to meet the recovery goals for the Newaygo Recovery Unit.

In 2012, the estimated minimum KBB abundance within the Manistee National Forest was between 4,072 and 5,700.

In 2013, a total of 1,101 acres of Karner blue butterfly habitat was monitored. Thirty-one out of the 62 Karner blue butterfly subpopulations monitored were occupied. During Distance sampling surveys, 348 Karner blue butterflies were observed within these subpopulations.

In 2013, an estimated minimum Karner blue butterfly abundance within the Huron-Manistee National Forests was between 3,265 and 4,571.

Figure 7 Long term trend in Karner blue butterfly presence/absence between 1997 and 2013 on National Forest System land on the Huron-Manistee National Forests.



Pitcher's Thistle

Populations of Pitcher's thistle on National Forest System (NFS) lands are monitored by the Forests every five years, unless threats indicate the need for more frequent monitoring. Pitcher's thistle monitoring was conducted in 2011 to track long-term trends in the population of this federally threatened species along the Lake Michigan shoreline and dune system within the Huron-Manistee National Forests. Eight monitoring sites were established in 1993 and then sampled during the summers of 1993, 1996, 2001, 2006, and 2011. Pitcher's thistle numbers have fluctuated up and down over the years; however, continued decline has never occurred and the population appears to be stable regardless of the fluctuations.

No Pitcher's thistle monitoring was conducted in 2012 or 2013.

Kirtland's Warbler (KW)

The 2012 and 2013 Kirtland's Warbler Census Reports contain detailed information on Kirtland's warbler population trends.

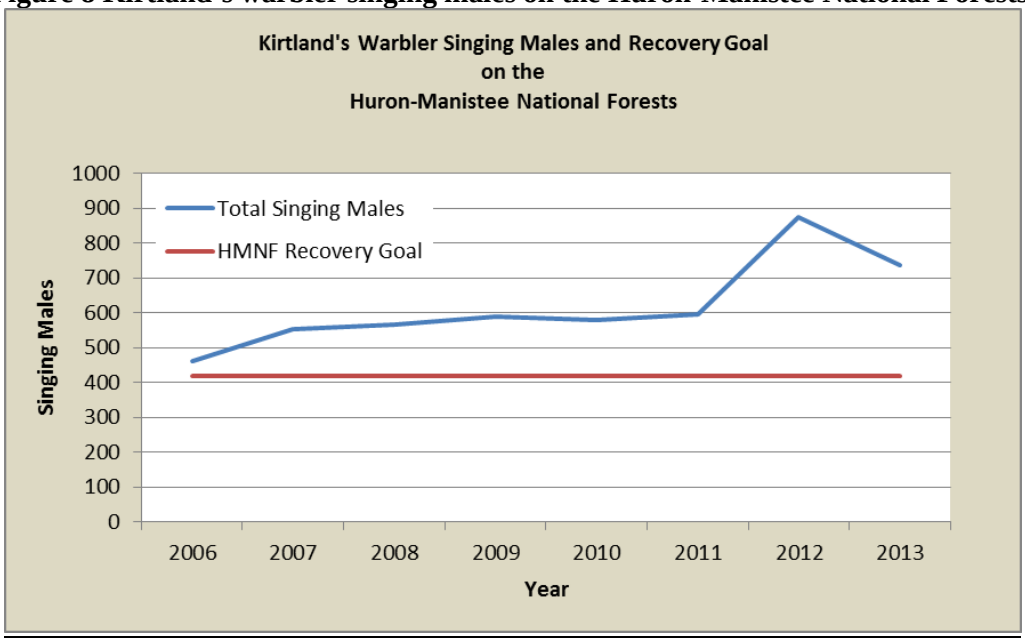
The portion of the 2012 census coordinated by the Huron-Manistee National Forests covered approximately 16,116 acres of National Forest System (NFS) lands on the Huron National Forest, and 2,801 acres on the Au Sable State Forest. In 2013, the portion of the census coordinated by the Huron-Manistee National Forests covered approximately 17,952 acres of NFS lands on the Huron National Forest and 2,389 acres on the Au Sable State Forest.

In 2012, the Forests have met the objective of providing habitat for a minimum of 420 singing males for the tenth consecutive year. The count of 873 singing males is 108% above the minimum of 420 singing males. Approximately 12,040 acres were occupied by Kirtland's warblers in 2012.

In 2013, census efforts on the Huron-Manistee National Forests located 738 singing males Kirtland's warblers on National Forest System (NFS) lands. This was 36 percent of the total singing male Kirtland's warbler population, about a fifteen percent decline from 2012. However, the 738-male count is still 76 percent higher than the Forest's minimum objective of 420 singing males in breeding habitat on NFSL.

The success from 2003 to 2013 can be largely attributed to the Forests' efforts to develop plantation habitat, and large wildfires that have created natural habitat. In 2013, approximately 23 percent of the singing males were in wildfire habitat.

Figure 8 Kirtland's warbler singing males on the Huron-Manistee National Forests.



Recommendations

Piping Plover

- ☑ Seasonal monitoring personnel (technicians, seasonals, interns, volunteers) should be trained and oriented to critical habitat no later than April if possible. This will 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 the fore-dune should continue.
- ☑ The District should be prepared to establish predator exclosures and other conservation measures when a nest is found on NFSL.

- ☑ The current pet leash regulation should be kept in effect, increasing enforcement patrols, and education efforts. The regulation for unleashed dogs should be enforced, with an increased emphasis for issuing violation notices.

Indiana Bat

- ☑ Surveys are limited by precautions to prevent introduction of White-nose Syndrome into Tippy Dam, the only known hibernaculum on the Huron-Manistee National Forests. Continue to communicate with Dr. Allen Kurta from Eastern Michigan University to determine the status of Indiana bats within the hibernaculum.

- ☑ Continue to implement Forest Plan guidelines to protect Indiana bats on the western half of the Manistee National Forest. Discuss potential modification of the guidelines with the US Fish and Wildlife Service to incorporate any new information on the species.

Karner Blue Butterfly

- ☑ Continue management efforts to maintain and expand occupied KBB sites. Explore other management technique and less expensive alternatives to promote native nectar sources (Rx burning, herbicide, discing, etc.).

- ☑ Complete a KBB Management Strategy to define KBB essential habitat, management techniques and display a long-term plan for habitat management to restore 7,332 acres this planning period, and 12,968 acres in decade 2. The strategy should include a harvest schedule, occupied habitat maintenance schedule, and prescribed burn schedule. The strategy would capture the knowledge and experiences of people who have worked with the KBB for many years. Provide the Baldwin Ranger District additional wildlife support during the KBB planning process.

- ☑ Consider finalizing data collection on demonstration plots. Shift program focus and field work from data collection to habitat improvement.

- ☑ Attempt to simplify and minimize the number of harvest restrictions on KBB timber sales. Formally consult with the US Fish and Wildlife Service when incidental take is necessary to complete KBB habitat improvement projects.

- ☑ Implement the recommendations in the 2012 KBB Program Review; or assemble a small team to review the recommendations and update the KBB program direction. This direction could then be incorporated into the KBB Management Strategy.

- ☑ Develop a table and graph for future monitoring reports that displays KBB restoration acres completed by year.

- ☑ Continue to monitor the population response to management actions.

Pitcher's Thistle

- ☑ Plan for semi-decadal surveys and assessment of Pitcher's thistle populations and habitat in 2016.

Kirtland's Warbler

- ☑ Explore opportunities to use prescribed fire and other pre-commercial treatments to supplement the acres harvested and reforested to develop breeding habitat for Kirtland's warbler, and meet the 1,600 acre per year objective.
- ☑ Explore opportunities to increase the acres harvested and reforested to reverse the trend of declining habitat, and move closer to meeting the 1,600 acre per year objective.
- ☑ Update the habitat development schedule for habitat treatments through 2022. Incorporate the recent wildfires (2006, 2010, and 2012) into habitat planning.
- ☑ Continue to work with the Michigan DNR and US Fish and Wildlife Service on the Kirtland's Warbler Conservation Plan.
- ☑ Continue the annual census and monitor the population response to management actions.

Pine Barren

Restoration of Savannas, Prairies, Dry Grasslands, Mesic Grasslands, Shrub/Scrub, Oak-Pine Barrens

Are goals for the restoration and maintenance of savannahs, prairies, dry grasslands, mesic grasslands, shrub/scrub and oak-pine barrens being met? Are prescribed fires or other management activities for the purpose of maintaining or creating Savannas, Prairies, Dry Grasslands, Mesic Grasslands, Shrub/Scrub, Oak-Pine Barrens moving these areas toward the desired future condition?

Savannas, Prairies, Dry Grasslands, Mesic Grasslands, Shrub/Scrub, and Oak-Pine Barrens restoration is an important component of the 2006 Forest Plan. As such, the Forests are tasked with monitoring and reporting restoration efforts, specifically:

- ☑ Restoration and maintenance of savannas, 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.

- ☑ Developing and maintain 20,300 acres of barrens habitat in the four Karner blue butterfly metapopulation areas and the essential Karner blue butterfly barrens habitat on the Manistee National Forest.

- ☑ Using prescribed fires or other management activities for the purpose of maintaining or creating savannas, prairies, dry grasslands, mesic grasslands, shrub/scrub, oak-pine barrens, moving these areas toward the desired future condition.

Monitoring Methods

In early 2010, the Forests' leadership formed a barrens restoration team to develop a standardized method of tracking the progress of barrens creation as current Forest Service databases are not compatible with the term, barrens. Additionally, it had become obvious that there is not enough funding or time to track progress in terms of the fine scale indicators often used to assess habitat condition.

Fortunately, it was determined that the **F**orest Service **AC**tivity **T**racking **S**ystem (FACTS) database could be utilized. FACTS is an activity tracking system for all levels of the Forest Service. FACTS supports timber sales in conjunction with TIM Contracts and Permits; tracks and monitors NEPA decisions; tracks Knutson-Vandenberg (KV) trust fund plans at the timber sale level, reporting at the National level; and, it generates National, Regional, Forest, and/or District Reports.

Secondly, in addressing the problem of assessing habitat conditions, the Baldwin/White Cloud (BWC) Ranger District, jointly with The Nature Conservancy (TNC), developed a set of easily assessed, coarse-level metrics for tracking the progress of restoration of barrens, also at the direction of the Forests' leadership team. The protocol is relatively quick and inexpensive, and does not require extensive botanical expertise. Having a standardized protocol to assess barrens will allow the Forests to coordinate management across multiple land ownerships and track the progress of all partners engaged in barrens restoration. The results will provide a way to share information and coordinate management with partners. Because the protocol is standardized, our partners will have similar information for adjacent lands. Using this tool, the Forests will work with partners to develop management strategies for creating contiguous blocks of barrens across multiple land ownerships on a landscape scale.

Monitoring Results and Evaluation

The final version of the monitoring coarse-level metrics protocol has undergone peer review, but still requires field testing by multiple user groups (i.e., Forest Service, Michigan Department of Natural Resources, etc.). Beginning with the summer of 2012, those involved in barrens restoration have been using the protocol to assess barrens in several management units. The results of the surveys will be used to: 1) test the assumption that coarse-level progress reflects fine-scale conditions; 2) assess the utility of the protocol on the ground and look for opportunities to improve the method; and 3) assess the utility of the results in the office. In addition, we will examine how to summarize the data collected and share it with partners to coordinate management activities.

Finally, in order to consolidate similar community types, the restoration team recommended the aggregation of savannas, prairies, dry grasslands, mesic grasslands, shrub/scrub, and oak-pine barrens habitats into three broad community types, including

Oak-pine barrens, Pine barrens (jack pine or red pine), and Dry-sand prairie. For the 2012-2013 Monitoring and Mid-term Evaluation Report, Ranger Districts were asked to revisit their monitoring data and report accomplishment acreages of oak-pine barrens, pine barrens, and dry-sand prairie from FY 2006 through FY 2013. Table 22below compares the projected amount of barrens (oak-pine barrens, pine barrens (jack pine or red pine), and dry-sand prairie) in the 2006 Forest Plan with actual accomplished from 2006 through 2013.

Table 22. Barrens Accomplishment 2006-2013 Compared with 2006 Forest Plan Projection, Decade 1.

Vegetation Class		Aspen /Birch	Short-lived conifer	Long-lived conifer	Low-site oak	High-site oak	Northern Hardwoods	Lowland Hardwoods	*Open*	*Total*
Forest Plan Projections, Decade	**Barrens Creation**		130	4,250	794	2,551	0	0	***1,593***	***9,318***
	Conversion of Old Growth to Barrens		0	0	0	0	0	0	***0***	***0***
Accomplished FY 2006-FY 2013	***Barrens Creation***									
	Oak-pine Barrens			257	477				***18***	***752***
	Pine Barrens		132	262					***10***	***404***
	Dry-sand Prairie									
	Subtotal Barrens Creation		***132***	***519***	***477***				***28***	***1,156***
	% Accomplished		***102%***	***12%***	***60%***				***2%***	***12%***
	Conversion of Old Growth to Barrens									
	Oak-pine Barrens									
	Pine Barrens		160	274					***15***	***449***
	Dry-sand Prairie									
	Subtotal Conversion of OG to Barrens		***160***	***274***					***15***	***449***
	Total Barrens Creation (Barrens Creation plus Conversion of Old Growth to Barrens)									
	Oak-pine Barrens			257	477				***18***	***752***
	Pine Barrens		292	536					***25***	***853***
	Dry-sand Prairie									
	Total Barrens Creation		***292***	***793***	***477***				***43***	***1,605***
	% Accomplished		***225%***	***19%***	***60%***				***3%***	***17%***
	% Accomplished when compared to forested Vegetation Classes, excluding 1,593 acres of Open.									***21%***

As shown in Table 22, during the period FY 2006 through FY 2013, the Forests initiated barrens conditions on 1,605 acres, or 17 percent, of the 9,318 acre barrens goal in the first decade of the 2006 Forest Plan.

Because it may take many years to establish actual barrens flora and fauna conditions on the landscape, the 1,605 acres to-date may only depict the initial beginning of what may eventually develop into barrens community types.

There were no acres projected in the first decade of the 2006 Forest Plan to be converted from designated old growth forest types to barrens. The Forests converted 449 acres of old growth short-lived and long-lived conifers to barrens.

Almost 3,900 acres of Savannas, 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, Table 23. Prescribed treatments employed habitat restoration tools such as timber harvest, prescribed burning, or hand release. The purpose of prescribed burns was largely for Fuels and Restoration, in Fire Regimes 1 & 2.

Prescribed fire on the Baldwin-White Cloud Ranger District focuses on restoring Endangered Karner blue butterfly habitat. Burning on Huron Shores and Mio Districts restores fire-adapted ecosystems and protects human life, and prepares habitat for endangered Kirtland's warblers. Prescribed fire in these dry sand prairies also improves habitat for Regional Forester's Sensitive Species including pale agoseris (false-dandelion - *Agoseris glauca*), Hill's thistle (*Cirsium hillii*) and rough fescue (*Festuca altaica*).

Table 23 Acres within Fire-adapted LTAs Treated with Prescribed Fire, FY 2010.

Ranger District	Broadcast Burn	Under Burn	Wildlife Habitat Prescribed Fire	*Totals*
	Acres			
Baldwin - White Cloud	56	0	579	***635***
Cadillac - Manistee	0	0	117	***117***
Huron Shores	190	1,017	78	***1,285***
Mio	921	734	171	***1,826***
Huron-Manistee National Forests Total	***1,167***	***1,751***	***945***	***3,863***

Recommendations

Unless positive changes occur, the Forests are not likely to meet the 2006 Forest Plan first decade barrens restoration projection of 9,318 acres. In the first half of the decade, FY 2006 through FY 2013, KBB management to create barrens conditions were initiated on 1,605 acres, or 17 percent of the projected acreage. An increase in the establishment of barrens habitat for Karner blue butterfly at a much larger scale than is currently occurring would be beneficial.

While some prescribed burning has occurred, fire is also largely underutilized as a management tool, both for creation of habitat and for enhancement and maintenance. Furthermore, opportunities to combine landscape scale projects such as fuels reduction and KBB conservation should be initiated to meet the high priority objectives with a diminishing work force and diminishing budgets.

The Forests should continue to explore options to amplify the capacity of restoration efforts such as: leveraging personnel and integrating programs within and across Districts; cross-training personnel to participate in restoration activities; developing stewardship projects; obtaining grant funding; supporting volunteer programs; maintaining existing and coordinating new partnerships to promote cooperative management strategies to maximize increases in barrens creation and connectivity across jurisdictional boundaries; and, using an adaptive management approach to ensure the most efficient and cost effective treatments are implemented at the landscape scale.

Monitoring includes short-term (implementation) and long-term (effectiveness). Short-term monitoring is focused on maintaining or moving existing conditions toward desired conditions. Implementation monitoring tracks acreage accomplishments. Long-term monitoring is necessary to determine the effectiveness of management in meeting or moving toward desired conditions in an acceptable timeframe. Both implementation and effectiveness monitoring and reporting are required in the Monitoring and Evaluation Report. The 2006 Forest Plan has an objective of establishing and tracking approximately 9,318 acres of “barrens” in the first decade of plan implementation. In order to facilitate accurate monitoring of barrens acres accomplished, Districts should implement the FACTS barrens tracking procedure and coarse metrics barrens protocol as developed by the barrens monitoring team in 2010/2013.

Trees

Restoration of Old Growth

Are goals for the restoration and maintenance of old growth being met? Are management activities for the purpose of maintaining or creating old growth moving these areas toward the desired future condition? Is the Forest Plan maintaining or restoring older forest ecosystems to desired conditions?

Monitoring Methods

Forest Service databases do not compile acreages of old growth restoration by vegetation class by fiscal year. Districts were asked to review their treatment records and record the data so that progress in old growth restoration could be provided. Wildfire Urban Interface (WUI) management activities implemented in old growth stands were obtained from the Forest Service Activities Tracking System (FACTS). FACTS tracks acres of management treatments accomplishment, but not always in the outputs format as depicted in the 2006 Forest Plan.

Monitoring Results and Evaluation

Within designated old-growth areas the controlling influences on vegetative community development and structure are natural processes (2006 FEIS, III-250).

Table 24indicates that Decade 1 projected zero acres of old growth restoration treatments. Decade 2 treatments were estimated at 6,347 acres. However, the Forests have almost met the Decade 2 goal, treating 6,121 acres through 2013, or about 96 percent completed. However, outputs and proposed and probable practices listed in acreage tables in the 2006 Forest Plan are projections based on available inventory data and some are based on computer modeling. Outputs and amounts are estimates only and are subject to annual budgets for funding the various resource programs on the Forests. As indicated by decade 1 and decade 2 old growth restoration efforts, actual amounts may vary from those predicted and are monitored on an annual basis.

Table 24 2006 Forest Plan Projected Old Growth Restoration Acres in the First and Second Decades.

	Aspen/Birch	Short-lived Conifer	Long-lived Conifer	Low-Site Oak	High-site Oak	Northern Hardwood	Lowland Hardwoods	*Total*
Decade 1	0	0	0	0	0	0	0	***0***
Decade 2	0	0	6,347	0	0	0	0	***6,347***
Old Growth Restoration Accomplishments by Vegetation Class, 2006-2013.								
	Aspen/Birch	**Short-lived Conifer**	**Long-lived Conifer**	**Low-Site Oak**	**High-site Oak**	**Northern Hardwood**	**Lowland Hardwoods**	***Total***
2006		25	351					***376***
2007	87	92	322	158		2		***661***
2008	33	632	79	27	184	81	159	***1,195***
2009	4	258	18	89		5		***374***
2010	33	595	1,011	209	184	149	167	***2,348***
2011			484	10				***494***
2012			560					***560***
2013			113					***113***
Total	***157***	***1,602***	***2,938***	***493***	***368***	***237***	***326***	***6,121***

Table 25below indicates management treatments in designated wildfire urban interface (WUI) areas of the Forests which are coincidentally, designated old growth areas. WUI management activity codes in old growth include: uninhabited, very low density vegetation, low density intermix, and medium density intermix.

Old growth biological components (vegetation, snags, down woody debris, etc.) should be managed primarily through natural processes. Old growth forests will be free to grow, move along forest successional paths (early to late to early successional cycles), and free to die (fire, wind, drought, insects, diseases, etc.).

Although natural processes should predominate within designated old-growth areas, some timber harvesting and mechanical treatments are permissible within the design. For example, forest conditions that were influenced directly or indirectly by humans will be actively managed if such management will ensure or expedite development of old-growth conditions (2006 FEIS, III-252). Old growth restoration treatments may include, but are not limited to, prescribed fire and mechanical treatments to meet the potential old-growth conditions, except in management area 5.1. Forest plan guidelines allow for a maximum of four restoration efforts to create old-growth conditions in any particular timber stand. Thus, management activities and treatment that would set a designated old growth stand back to an earlier seral stage or for the purpose of reducing wildfire ladder fuels should not be contemplated. The purpose of designated old growth is to maintain late successional forest and species, well distributed and biologically functional, throughout the Forests. Active management would result in crossing an "invisible" biodiversity threshold that would take decades to recover from.

Fuels treatments in old growth should have the objective of promoting characteristics that accelerate stands toward the desired condition. Prescribed fire and mechanical fuels treatment may be used for objectives other than hazard reduction, such as restoring potential old-growth conditions or controlling non-native invasive species. Fuel reduction efforts are prioritized to treat areas of high risk, including near or around communities-at-risk.

It is unclear from available corporate data which management treatments in Table 25are for the purpose of creating or enhancing old growth conditions and which are strictly for WUI purposes, i.e., hazardous fuel reduction. At any rate, 37,316 acres of management treatments in 174,119 acres of designated old growth is 21.4 percent.

Table 25 Wildfire Urban Interface (WUI) management treatments in designated old growth areas, 2006-2013.

Management Treatment	2006	2007	2008	2009	2010	2011	2012	2013	*Total*
Broadcast Burning - Covers a majority of the unit			1,541		1,607		1,468	721	***5,337***
Burning of Piled Material							65	1,468	***1,533***
Commercial Thin	377	1,624	1,531	1,346	1,196	455	1,164	652	***8,347***
Compacting/Crushing of Fuels					1,729				***1,729***
Fuel Break		78	81		1,435		91	696	***2,381***
Group Selection Cut (UA/RH/FH)							59		***59***
Harvest Without Restocking					252			55	***307***
Jackpot Burning - Scattered concentrations				157					***157***
Piling of Fuels, Hand or Machine		185			133				***318***
Sanitation Cut				10			29		***39***
Shelterwood Establishment Cut (with or without leave trees) (EA/RH/NFH)					76				***76***
Site Preparation for Natural Regeneration - Manual						172		33	***204***
Stand Clearcut (EA/RH/FH)			299	1,502					***1,801***

Management Treatment	2006	2007	2008	2009	2010	2011	2012	2013	*Total*
Stand Clearcut (w/ leave trees) (EA/RH/FH)						490	615		***1,105***
T&ES non-structural improvement					243				***243***
Thinning for Hazardous Fuels Reduction		85		1,423	219				***1,727***
Underburn - Low Intensity (Majority of Unit)		949	3,173	1,749	1,509	1,470	583		***9,433***
Wildlife Habitat Mechanical treatment		137			290	64	179		***670***
Wildlife Habitat Prescribed fire		384		237	598	217	416		***1,852***
Total	***377***	***3,442***	***6,625***	***6,424***	***9,286***	***2,868***	***4,669***	***3,625***	***37,316***

Recommendations

Continue to manage designated old growth for their old growth characteristics.

More detailed record keeping needs to be done to track management treatments in designated old growth. The FLT should consider separating WUI acres from designated old growth areas.

Meridian Fire, 2010

Fire Prevention and Fire Suppression

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

Large catastrophic wildfires occur on a regular basis on the Huron-Manistee National Forests. Approximately every 3-4 years more than 1,000 acres burn in a single fire in the conifer fuel types. The Forests manages a large part of the largest contiguous area of jack pine forest in the United States. Jack pine on quick drying sandy soils generates very high fire danger in April and May. The highest fire danger occurs before and during the new pine needle growth, and a lesser extent through the summer/fall.

Smaller fires are fairly common on the Forests, but an organized response minimizes their severity. The fire suppression response is commensurate with the hazards at risk. Minimum impact suppression tactics like water and hand tools may be all that is needed on some fires, where a dozer plow line and aerial resources may be needed on another. Safety of employees and public is the first objective of every wildfire response. Suppression tactics are decided on by the Incident Commander on each fire.

The Forests have had an active fire prevention program. Local media, including television and radio, are provided with up to date fire danger information. Programs like FireSafe are provided to the public to promote involvement in activities that reduce fire risk around homes and cabins.

Monitoring Methods

On site review of wildland fires is completed by line officers. Prescribed burn plans and project implementation were also reviewed by line officers and fire staff. Line officer participation in after action review discussions are accomplished for safety concerns and rating how well objectives were met.

The Forests had 207 fires in 2012 and 164 fires in 2013 that had a Forest Service response. Responses involved from one fire engine responding to the scene, to multiple engines, dozers, and aircraft responding.

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. Aerial ignition is being used to accomplish landscape scale burning. Detailed briefings prior to implementation and After Action Reviews (AARs) are completed on all burns to acknowledge success and assess possible actions to improve burn management.

Evaluation and Conclusions

The Forests are very strong in promoting safe practices in fire suppression, fuels management, and fire prevention. Forest Leadership and firefighters have their main emphasis on personnel safety in all activities on and off Forest.

Wildland fire suppression and prescribed burning did not result in any serious 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.

Adequate communications are the backbone of safe fire suppression and prevention. A fully functioning Forestwide radio system, with back up, is paramount. Interoperability with cooperators is also essential. The Michigan Department of Natural Resources (DNR), other federal land management agencies, Law Enforcement, and Local Fire Departments are all part of a safe and effective fire program. Coordination and cooperation has been very good.

An Annual Operating Plan is updated each year with the State of Michigan to facilitate firefighting operations when both organizations are involved. Face to face meetings with the State are done annually to coordinate fire suppression efforts.

Recommendations

Continue with fire prevention activities currently ongoing. Fire suppression activities should continue as directed by the Forest Plan and the Forest's Fire Management Plan. Monitoring of these activities should proceed as planned as they appear to be an effective tool for promoting safe fire suppression improvements.

Realizing the potential for wildfires such as the 8,600 acres 2010 Meridian fire, there is a continued need for aerial suppression resources capable of effective initial attack and proper aerial supervision, including air tanker and/or heavy helicopter resources. The Forests should continue to work with Region 9 and the Great Lakes Forest Fire Compact to improve availability of aerial suppression resources during spring fire season.

Mapes Prescribed Burn

Distribution of Fire Condition Class

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? Are wildfires being suppressed using appropriate response? Are analyses being performed on prevention, presuppresssion, and suppression?

Forest fuels planners are determining class change by percentage based on condition change from the fuel reduction and vegetation management activities. Generally, vegetation management activities lower the tons-per-acre of burnable fuel available in the treatment area. Condition class change is being recorded in FACTS as projects are completed.

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 Methods

The Forests had 164 fires in 2013 that burned 220 acres. The largest of these fires consumed 58 acres, two homes were damaged and 2 outbuildings were destroyed. The fire was started by someone burning brush. In 2012, 207 wildfires consumed 1067 acres, with the largest fire being the Little Mack Lake which burned 820 acres. Line officers review some of the larger fires each year, and this will continue.

Table 26 Huron-Manistee National Forests FY 2012 Statistical Wildfire Causes.

Cause	Fires	Percent	Acres	*Percent*
Lightning	3	1%	7	***1%***
Equipment	13	6%	24	***2%***
Smoking	6	3%	7	***1%***
Campfire	11	5%	22	***2%***
Debris	68	34%	47	***4%***

Cause	Fires	Percent	Acres	*Percent*
Arson	17	8%	875	***82%***
Children	6	3%	7	***1%***
Railroad	0	0%	0	***0%***
Miscellaneous	32	16%	25	***2%***
Powerlines	40	19%	34	***3%***
Structure spread	6	3%	10	***1%***
Fireworks	5	2%	9	***1%***
Total	***207***	***100%***	***1,067***	***100%***

Table 27 Huron-Manistee National Forests FY 2013 Statistical Wildfire Causes.

Cause	Fires	Percent	Acres	*Percent*
Lightning	1	1%	16	***7%***
Equipment	12	7%	8	***4%***
Smoking	4	2%	1	***1%***
Campfire	21	13%	20	***9%***
Debris	68	41%	107	***49%***
Arson	13	8%	9	***4%***
Children	5	3%	3	***1%***
Railroad	0	0%	0	***0%***
Miscellaneous	27	17%	50	***22%***
Powerlines	12	7%	5	***2%***
Fireworks	1	1%	1	***1%***
Total	***164***	***100%***	***220***	***100%***

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 where appropriate, and the use of aviation resources. Firefighter and public safety are always the first consideration of the fire suppression response.

The Forest accomplished 2,507 acres of prescribed burning in FY 2012.

Vegetation Management, mostly timber harvesting, was completed on approximately 8,500 acres in 2012, which lessened fire danger and improved condition class (mainly thinning in red pine). See Table 28.

The Huron Zone was able to safely complete more than its program of work in prescribed fire.

The Manistee Zone was also able to complete most scheduled prescribed fires.

Table 28 Prescribed Fire / Mechanical Fuels Treatment, FY 2012.

Acres	Mechanical	Fire	*Total*
Hazardous fuels	242	2,265	***2,507***
Condition class change by vegetation management	6,467	N/A	***6,467***
Total	***6,709***	***2,265***	***8,974***

The Forest accomplished 3,507 acres of prescribed burning in FY 2013.

Vegetation Management, mostly timber harvesting, was completed on approximately 8,500 acres, which lessened fire danger and improved condition class (mainly thinning in red pine).

Table 29 Prescribed Fire / Mechanical Fuels Treatment, FY 2013.

Acres	Mechanical	Fire	*Total*
Hazardous fuels	232	4,810	***5,042***
Condition class change by vegetation management	4,553	N/A	***4,553***
Total	***4,785***	***4,810***	***9,595***

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

Evaluation and Conclusions

Condition class change was accomplished on these project areas that moved them toward a fire regime that is within a historical range defined in terms of departure from the historic fire return interval. This means vegetation attributes (species composition and structure) are intact and ecosystems are functioning within their historical range. Cumulative effects as larger areas are treated each year add to beneficial landscape level changes across the Forests.

Annual Fire 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.

Recommendations

A quick suppression response to wildfires in the conifer fuel types on the Forests makes the difference between a small fire and a large destructive fire. Monitoring of initial attack success of holding fires to low acres burned is done to judge suppression effectiveness. Review and discussion at well attended After Action Reviews of fire events help personnel learn from experiences.

Continue on current course with activities that improve condition class, document those change determinations, input them into databases, and continue to suppress wildfires with minimum impacts to the landscape. At the same time, activities will continue to be assessed and carried out to provide for firefighter and public safety.

Pile burn near Mack Lake area.

Fire Hazard Rating

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?

The priority for fuel reduction activities are high fire hazard areas around homes and cabins. Most of these areas are 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 priority treatment.

Monitoring Methods

Hazard rating reduction takes place through vegetation management fuels treatments. In FY 2012 the Forests accomplished activities on over 8,500 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 Forests and lessen the risk to Forests employees and public. Vegetation Management projects that reduced fire hazard are entered into the FACTS database.

Evaluation and Conclusions

The Forests are not measuring hazard ratings per se, though fuel hazard reduction activities reduce the tons of fuel available to burn in wildfires. Fire suppression activities are most always more successful when there is less fuel to burn in a wildfire. The hazardous fuel reduction projects are making a difference in wildfire risk.

After six years of Forest Plan implementation, the Forests are doing reasonably well with implementation of fuelbreak and hazardous fuel reduction activities

Table 30 Fuelbreak and Hazardous Fuel Accomplishment, Totals 2006-2013.

Vegetation Class	Aspen /Birch	Short-lived conifer	Long-lived conifer	Low-site oak	High-site oak	Northern Hardwoods	Lowland Hardwoods	Open	*Total*
2006 Forest Plan Projections									
Fuelbreaks		4,940	13,090	1,980					***20,000***
Hazardous Fuel Reduction		80,000							***80,000***
Accomplished FY 2006-FY 2013									

Vegetation Class	Aspen /Birch	Short-lived conifer	Long-lived conifer	Low-site oak	High-site oak	Northern Hardwoods	Lowland Hardwoods	Open	*Total*
Fuelbreaks	260	2,415	2,560	1,720	1,030			300	***8,285***
% Accomplished	-	49%	20%	87%	-	-	-	-	***41%***
Hazardous Fuel Reduction	1,065	12,900	24,790	6,230	2,645	650	-	-	***48,880***
% Accomplished	-	***16%***	-	-	-	-	-	-	***61%***

Recommendations

It will take many years of hazard reduction and condition class change to get much of the Forests back to pre-settlement conditions. The Forests have experienced wildfires that have burned up to or into areas that have had hazardous fuel reduction treatments, and in all cases the fire behavior has lessened. This has allowed safer and more effective fire suppression.

An exception to a more natural condition class being less fire danger is the jack pine fuel type. Jack pine in its natural condition is regenerated with stand replacement fire approximately every 30 to 50 years. Through fuel break construction and maintenance, and Kirtland's warbler harvest areas, the Forests are attempting to mitigate large wildfire potential in this fuel type.

Monitoring of prescribed burns, including photo points, for fuel loading reduction, crown scorch, tree mortality, and ladder fuel reduction is being done and should be continued in the future. Fuel treatment effectiveness is recorded on a regional form when wildfires burn into treatment areas. Each year more evidence of the good effects of hazard reduction treatments is documented as more wildfires burn into areas that have had fuel reduction activities.

In order to track, monitor, and plan fuels treatment, the Forests should implement the use of LANDFIRE (also known as Landscape Fire and Resource Management Planning Tools). LANDFIRE is an interagency vegetation, fire, and fuel characteristics mapping program, sponsored by the United States Department of the Interior (DOI) and the United States Department of Agriculture, Forest Service.

LANDFIRE data products consist of over 50 spatial data layers in the form of maps and other data that support a range of land management analysis and modeling. Specific data layer products include: existing vegetation type, canopy, and height; biophysical settings; environmental site potential; fire behavior fuel models; fire regime classes; and fire effects layers. The most effective use of the products is at the landscape scale.

The true effectiveness of the hazardous fuel reduction activities on the Forests will be evidenced after years of additional hazard reduction work, and as fire behavior is monitored of wildfire events that burn into those treatment areas.

Continue to focus fuel reduction activities in fire dependent ecosystems and urban interface areas that are at risk from wildland fires. Monitoring of prescribed fire events and hazard reduction activities should continue in the same manner that is currently being conducted.

It is recommended that the Forests expand the use of aerial fire application as contrasted with hand firing techniques which often extend burn periods, achieve varying burn prescription results, increase safety risk to personnel, and increase costs. Also, relying on hand firing techniques typically limits the size of burn units which impacts the Forests' capacity to expand future prescribed fire requirements.

Garlic Mustard

Non-native Invasive Plant Species

To what extent are management treatments reducing non-native invasive species infestations and preventing new invasive species from becoming established, when possible.

Monitoring Methods

Non-native invasive plant species (NNIP) are targeted with a two-pronged approach on the HMNF: 1) high priority management areas such as recreation areas, wild and scenic areas, rare species habitat, research natural areas, and wilderness areas; and, 2) highest risk species based upon biological characteristics of the species and occurrence within the Forest. In addition, project level Environmental Assessments (EA) target some additional treatment of more established NNIP populations to address removal of species ranked at lower levels due to more frequent occurrence and/or higher population densities. This aspect of the NNIP program is largely limited by funding and personnel constraints, however, it allows the Forest to address issues such as autumn olive negatively affecting aspen regeneration or NNIP affecting successful savanna restoration.

High Priority Management Areas

Monitoring Results and Evaluation

Lake Mitchell Big Cove

In the past, the Forests have worked in partnership with The Lake Mitchell Improvement Board (LMIB) to monitor and treat Eurasian water milfoil (*Myriophyllum spicatum*) using Integrated Pest Management. Herbicide treatment with 2, 4-D has resulted in a good response of reduction of milfoil biomass. Planting of milfoil-eating weevils

(*Euhrychiopsis lecontei)* had mixed results and there is not strong partnership response for continued weevil planting. New data indicates the presence of a hybrid milfoil that is more difficult to treat chemically. Partnership strategies switched in 2010/11 with HMNF funding going to the purchase of loosestrife eating beetles (*Galerucella pusilla)* which were released in 2012/13. The Forest Service has a campground and boat launch on Lake Mitchell in the Big Cove area in the southwest portion of the lake that is impacted by both the milfoil and purple loosestrife.

Au Sable River

An infestation of garlic mustard (*Alliaria petiolata)* in riparian habitat below Foote hydro-electric dam on the Au Sable River has been treated on an annual basis since 2008 through a partnership between Consumers Energy and the Forest Service. Each year, the approximately 5 acre area is treated with herbicide in the spring and fall. In the spring of 2012, a volunteer event was organized between Huron Pines, the Forest Service, and Consumers Energy to pull the invasive. Over 20 volunteers from the local community learned to recognize and report on this problematic invasive species. The Forest Service contacted adjacent private land owners who joined the event and helped pull garlic mustard on Consumers and also on their land.

Seventy-eight acres of purple loosestrife were treated along the banks of the Au Sable River using GLRI funds. Treatment included integrated pest management techniques; in the spring of 2012, ten thousand *Galerucella pusilla* beetle were released in highly infested areas along the lower Au Sable and flower heads of smaller infestations were clipped and swiped with herbicide. Effectiveness of biotic control was then assessed in August and evidence of beetle movement to other infested areas was noted. Loosestrife on Mio Dam was clipped and treated with herbicide.

Tuttle Marsh

Fifty acres of Phragmites was treated through the CWMA with the Northeast Michigan's Huron Pines Americorp staff. All Phragmites at Tuttle Marsh wildlife viewing areas was also treated.

Loda Lake Wildflower Sanctuary

Loda Lake is a designated Weed Free area on the Forest. Invasive inventory and treatment occurs annually to suppress/eradicate: periwinkle (Vinca minor), spotted knapweed (Centaruea stroebe), hoary alyssum (Berteroa incana), purple loosestrife (Lythrum salicaria), autumn olive (Elaeagnus umbellata), St. Johnswort (Hypericum perforatum), and white sweetclover (Melilotus alba). Purple loosestrife at Loda Lake was treated by hand clipping of flowering heads to prevent seed formation in 2010 and herbicided with aquatic formulated glyphosate in 2011. Monitoring found the population reduced to just four stems. While it is expected that the seed bank will continue to contribute new loosestrife to the site, control looks to have been very effective at this site. This area of shoreline is the habitat for some uncommon native orchids and wetland plants and impacts of purple loosestrife could severely impact the presence of these desired species. Other species treated at Loda have been treated since 2005 and have similarly responded positively to treatment with all NNIP populations reduced to incidental occurrence with the exception of autumn olive. Autumn olive will continue to remain an on-going problem due to private landholdings adjacent to Loda Lake which have large populations of this shrub which produces abundant berry crops that are easily transported by birds to Loda.

Pere Marquette (PM) Wild and Scenic River

In 2012 a partnership between the PM Watershed Council, the Lake County Riverside Property Owners Association and the Baldwin-White Cloud Ranger District was developed to begin inventory of all lands within the Wild & Scenic River Corridor. In 2012, three invasive-plant float trips were made to begin the inventory. Much of the river-viewed corridor in the upper section of the River was free of invasive plants with the exception of black locust (*Robinia pseudoacacia*), purple crown vetch (*Securigera varia*), and periwinkle (*Vinca minor*) that had been planted either to control erosion on steep slopes or as a yard landscaping material. Other large pockets were found of non-native honeysuckle bushes (*Lonicera* spp.). Invasive plants known to occur at Forest recreational use sites in the Corridor continued receiving treatment: leafy spurge (*Euphorbia esula*), purple crown vetch (*Securigera* varia), garlic mustard (*Alliaria petiolata),* and Japanese barberry (*Berberis thunbergeii*). The garlic mustard site at Clay Banks Campground has been reduced in size and number

of garlic mustard plants with annual pulling and herbicide treatment that began in 2008. All barberries at Green Cottage on the Pere Marquette River were dug up and removed in 2009. All resprouts were herbicided in 2010, along with additional mechanical treatment and mechanical pulling occurred on newly germinated plants in 2012. Leafy spurge had been reduced in size once the herbicide imazapic was added to glyphosate treatment in 2010. While glyphosate kept the population from growing larger, imazapic has reduced the population to 1/5 of its original size, however some stems now occur closer to the River, outside of the original treatment boundary. Crown vetch has been reduced in abundance of plants due to glyphosate treatment, however plants continue to appear in smaller numbers throughout the original infested area and annual treatment has occurred since treatment began in 2009.

Wolf Lake Motorsport and Horse Trails

A small population of garlic mustard was discovered in this multiple use recreation in 2009. Expanded inventory of the site in 2010 resulted in an awareness of a much larger extent of the NNIP population occurring along a motorsport trail and expanding into surrounding forest into a smaller intersection with horse trails. Herbicide treatment using glyphosate and pulling/removal of flowering stems began in 2009 and has continued annually. The population extant is estimated at about 500 acres. Risk for spreading is high due to ground disturbance on the trail system and, in fact, the population has expanded another ½ mile to the south along the motorcycle trail.

Endangered Karner Blue Butterfly Habitat

Leafy spurge (*Euphorbia esula*) is the first NNIP that the Forest began to address in Karner Blue Butterfly (KBB) habitat with initial treatment using glyphosate in the M37 project area in 2008. Glyphosate kept the population from increasing; however it did not reduce the population. In 2010 the Forest switched to use of imazapic and expanded treatment to include cypress spurge (*Euphorbia cyparissias*) in the White River KBB area, while work in the M37 area was put on hold since the endangered butterfly is no longer present at the site. Imazapic treatment at the White River site has resulted in reduction to a population 1/10 the size of the initial cypress spurge population. Other species herbicided in the White River KBB habitat in the past included non-native honeysuckles (*Lonicera* sp.), autumn olive (*Elaeagnus umbellata*), garlic mustard (*Alliaria petiolata*) and multiflora rose (*Rosa multiflora),* tree-of-heaven (*Ailianthus altissima*), and barberry (*Berberis* spp.), while a small, initiating population of purple loosestrife (Lythrum salicaria) was hand pulled. Monitoring of effectiveness indicates that the garlic mustard has been reduced to about a 2 square foot area, the non-native shrubs rose will need future treatment for resprouting, and the other species have been successfully eliminated from their known treatment locations.

In 2012, thirty-four acres of St. Johnswort and 14 acres each of spotted knapweed, hoary alyssum and common mullein were treated in nectar habitat for the endangered Karner Blue Butterfly. In 2013, the number of nectar increases hand treated for the same species as above increased to 60 acres .

In the Bigelow/Newaygo Prairie KBB metapopulation site, botanical surveys were conducted in 2011 and 2012. Five populations of garlic mustard sites (all small) were located and treated in 2012 and will need retreatment annual until eradication occurs. Twenty-two other species have been found in the NEPA project area which is proposed for expanding KBB habitat and restoring prairie. Though not all NNIS occur on or adjacent to KBB habitat, a proposed District NEPA identifies treatment of these species to reduce NNIS in this area of the Forests.

Pine River Wild and Scenic River

A large population of Oriental bittersweet (Celastrus orbiculatus) was discovered and treatment began in 2011. In 2012 glyphosate was applied on 22 sites covering 64 acres. Seven sites were treated in 2013 totaling 7 acres. The decrease in treatment between 2012 and 2013 was due to lack of funding. All 22 sites treated in 2012 will need some amount of follow-up treatment in 2014.

Lake Michigan Shoreline and Nordhouse Dunes Wilderness Area

Eight non-native invasive species were treated along the Lake Michigan shoreline to improve habitat for Pitcher's thistle and Piping plovers, including spotted knapweed (Centaurea stoebe), autumn olive (Elaeagnus umbellata), non-native honeysuckle (Lonicera sp.), cheatgrass (Bromus tectorum), houndstongue (Cynoglossum officinale), Japanese barberry (Berberis thunbergii), Lyme grass (Leymus arenarius), and Lombardy poplar (Populus nigra). Previous treatment of Oriental bittersweet (Celastrus orbiculatus) appears to have been successful in eliminating this species from the Nordhouse Dunes Wilderness. Over 413 acres of treatments were completed along the Lake Michigan shoreline in 2012 and 474 acres were treated in 2013.

Endangered Indiana Bat Habitat

During 2012 approximately 690 acres of treatment was conducted in 2012 for 16 plant species in Indiana Bat habitat. About 123 acres of the treatments occurred within the 5-mile buffer around Tippy Dam. In 2013 an additional 536 acres of treatment took place for 17 plant species. About 38 acres were treated within the 5-mile buffer around Tippy Dam.

High Priority NNIP Species

The Huron-Manistee NNIP list was updated in 2013 to bring the total number of treatable NNIP to 91. Each of these species has undergone a risk assessment that addresses the biological characteristics which make the species an aggressive plant on the landscape, the distribution and abundance of the species on the Forest or in the State; and the risk of the species affecting site ecological conditions. Species considered of highest risk that are not already prevalent on the Forest are the species targeted for detection and treatment. These species are given ranks of "1" for not yet on the Forest, or "2" present but at very low levels. Forty-eight of the 91 species listed are rated as "1" or "2". These highest targeted species that have received treatment on the Forest include: tree of heaven, garlic mustard, Japanese knotweed, Japanese barberry, Asian bittersweet, purple crown vetch, multiflora rose, lyme grass, and non-native honeysuckles. Additional NNIP species such as autumn olive and Scots pine may be treated as part of project level treatment.

Monitoring Results and Evaluation

Chemical treatment of garlic mustard on Consumers Energy property appears to be effective at setting back the invasion along the banks of the Au Sable River. However, with adjacent private land still remains a source to the population, additional control measures are still necessary. The funds from the Challenge Cost Share Agreement that the Forest Service entered with Consumers Energy in 2008 expired at the end of 2012. Additional herbicide for planned treatments occurred in spring of 2013.

Chemical treatment of garlic mustard at Clay Banks Campground on the Pere Marquette has resulted in a reduction of spread and a reduction in plant numbers. Barberry continues to require treatment as resprouting continues to be an issue at Green Cottage. Likewise, crown vetch and leafy spurge will continue to receive herbicide treatment until the area is eradicated of these species at Bowman Bridge.

Garlic mustard at the Wolf Lake trail area continues to be difficult to treat due to the size of the infestation which is all in forested habitat. Herbicide will be continued as long as funding is available for treatment. This area continues to be a concern due to the proximity to higher density recreational properties around Wolf Lake and the likely spread to these properties and further up and down the motorsport trail system.

All NNIP that have been targeted have been reduced in abundance within the endangered Karner blue butterfly habitat locations.

Successful initial treatment of Oriental bittersweet on the Pine River began in 2011 and will continue for many years. Continued mapping and inventory of NNIS on the Pine River will took place in the latter part of 2012 and the river will continue to be monitored in future years.

NNIP in the Wilderness Area continue to require considerable labor for mechanical removal, however results are showing a decrease in the NNIP presence in the areas which have been treated annually for close to a decade. Herbicide use on Lombardy poplar and Lyme grass has greatly enhanced effectiveness of treatment of these species since they were approved for use in the Wilderness area.

Newly introduced species are also being targeted through the Early Detection, Rapid Response capability provided by the Forest Non-Native Invasive Plant EA. Priority detection and treatment is focused on species ranked 1 (not yet on the Forest or newly found) and rank 2, species with very low occurrence frequency on the Forest. Education of all permanent and seasonal staff, plus volunteers, partnering organizations and the public is a major component of effective early detection on the Forests.

Spotted Knapweed

Non-Native Invasive Species – Strategy

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?

The National NNIS Strategy includes four elements: Prevention, Early Detection and Rapid Response, Control and Management, and Rehabilitation and Restoration.

Prevention

Prevention includes timber sale contract provisions requiring equipment cleaning in timber sale contracts; seeding in landings and fire line, sediment basin spoils sites, and other disturbed areas with native or non-persistent non-native species; and doing community outreach and education to decrease the likelihood that Forest visitors will introduce NNIP into the Forest. Equipment cleaning has begun to be required for internal equipment use. Boot brush stations are located in highly visited recreation sites to reduce seed transfer from other areas. These receive heavy use by visitors. Future project implementation will increase signage providing education on aquatic NNIS prevention at boat launch sites on the Forest.

Early Detection

Early Detection and Rapid Response have been addressed by working with several partners including the Northwest Michigan Cooperative Weed Management Association (CWMA), Michigan Dune Alliance, and Huron Pines Northeast CWMA, and the Stewardship Network West Michigan Cluster to identify new NNIP infestations. The Forests utilize seasonal employees and student interns to locate NNIP. A presentation is given during an early summer safety meeting to familiarize personnel with high priority NNIP. All field-going personnel are asked to report invasive plant species. NNIP locations are verified by botany staff and entered into the Natural Resources Information System (NRIS) and analyzed for response strategy. In addition, botanists survey all areas proposed for future treatment or activities. Similarly, all NNIP finds are evaluated for response strategy and entered into the NRIS database if a treatment is determined to be part of the response.

Control and Management

Control and Management is achieved as resources are available. Partnering with three existing CWMA's, the Michigan Dune Alliance, and the Stewardship Network is advantageous because of their ability to obtain grants. The Forests also work with volunteer groups teaching them how to identify NNIP and how to treat infestations on Forest Service and adjoining property. Partnering with the Huron Pines Northeast CWMA, AmeriCorps is focused on eradicating three NNIP species along Lake Huron Shoreline. Grant funding from the Great Lakes Restoration Initiative is helping increase treatment at Lake Michigan shoreline for eight NNIP species. Stewardship Network partnership has increased treatment of garlic mustard in Newaygo County and plans are underway to expand to additional invasive species.

Rehabilitation and Restoration

Rehabilitation and Restoration is accomplished by using native or non-persistent non-native species in rehabilitation of landings, well pads, sediment basin spoils sites, road obliteration, fireline and other disturbed areas.

The Huron-Manistee NNIP list was updated in 2014 to bring the total number of treatable NNIS to 91. NNIP presentations were given to local organizations to teach the public about NNIP and impacts to the forest.

The Forest goal is to follow the national strategy where the least widespread NNIP are treated first unless there is a site specific goal of ecological restoration, such as at high priority management sites. The Forest requires equipment cleaning clauses in timber contracts and equipment cleaning has begun to be included for internal equipment use when conducting habitat treatment within project EAs.

All NNIP populations which receive treatment are evaluated and monitored for effectiveness and retreatment needs during the current year and for the following year. Timber harvest landings are monitored for NNIP after timber sales are concluded. This information is stored in the Natural Resource Information System (NRIS), the geo-based national database of record.

Most of the Forest NNIP inventory is related to project level surveys.

Monitoring Results and Evaluation

The Forests are doing what they can to control NNIP. The Forests strategy is being implemented and has become integrated with most program activities. The Forests have become more proficient at implementing the treatment part of the strategy, with an increase in diversity of treatment equipment, techniques, and chemicals. There has also been an increase in public outreach due to partnership focus and volunteers trained to do NNIP treatment. In terms of area infested, we expect an increase in infestation occurrence and density despite treatment due to the nature of invasive plants. Funding/time constraints will continue to be a factor which determines how many acres can be inventoried, treated or monitored. As a result, monitoring will be conducted only at treated sites unless special targeted area funding is obtained, such as watershed analysis. Future assessment of total infestation will continue to be hindered by project area survey, only. However enhanced assessment using FIA data may be a possible avenue to improve infestation assessment.

Hand-weeding the Nordhouse Dunes Wilderness Area

Non-Native Invasive Species – Treatment

What percent of NNIP sites and acres have been treated, and how effective was the treatment?

Monitoring Methods

A small percentage of nonnative invasive plant (NNIP) populations have been treated on the Forests. However, the NNIP program is growing and it is anticipated that the number of acres treated will increase over time, largely due to the addition of Great Lakes Restoration Initiative funding.

In FY 2012, the Forests treated NNIP covering approximately 554 acres. This grew to 864 acres, for a total of 1,418 acres treated, due to additional funding through the Great Lakes Restoration Initiative. The area treated by the Forests increased in 2013 to 636 acres, and 794 acres were completed with GLRI funding for a total of 1,430 acres treated. Cooperative agreements and expansion of the program with partnerships for treatment is resulting in increases of treatment in the past two years.

While the percent mortality is high from most herbicide treatments, there are still a number of years needed for repeat (annual) treatment due to length of seed viability in the seed bank. New treatment methods adopted that have improved effectiveness or efficiency include the use of herbicide capsules injected into woody stems, basal bark painting, and use of more targeted herbicides such as imazapic. Hand weeding and pulling with a weed wrench has also shown a positive impact on NNIP presence in several recreational/administrative sites; however, continued annual treatment necessary.

The first site identified for treatment on the Baldwin District in 2002 has achieved total eradication of garlic mustard, with no garlic mustard plants present in 2010 through 2013 field seasons. The approach of Early Detection, Rapid Response for newly introduced NNIP species, and treatment of NNIP in high quality and high-

risk-for-spread sites will continue to allow the Forests to concentrate on the top tier of the NNIP infestations, still at less than 1 percent.

For new native plant seeding restoration sites, hand weeding is done annually for each site to keep NNIP from becoming established. In some cases, where needed, additional herbiciding may be done for species such as leafy spurge, which cannot be treated by hand pulling.

All treatment sites are monitored by visual observation each year, remapped if necessary, and evaluated for treatment activities needed the following year.

Monitoring Results and Evaluation

Districts are expanding their staff's knowledge and experience with treatment methodologies. The Districts are becoming more proficient and able to expand in the area of NNIP treatment. However, funding continues to be the biggest limiting factor for dedicated control efforts. Every year, new infestations and new species to treat are found in addition to sites that have been undergoing treatment. There are also more sites to monitor for the efficacy of the previous year's treatments. The cumulative effect of more work to do and increasingly less time to devote to it, as we are expected to do more with less every year limits progress. As much as possible, leveraging through partnership and education of a community based volunteer network is being used to expand the NNIP program.

Recommendations

As expected, additional funding and personnel to control NNIP is required. Monitoring of NNIP and evaluation of NNIP treatment "SWAT" teams would be ideal. A SWAT team currently exists on the Cadillac-Manistee District with Great Lakes Restoration Initiative funding support. A SWAT team exists as part of the CWMA on the east side for the Huron Shores District. Continue to provide funding support for CWMA and Stewardship Network participation to increase NNIP education and treatment within the Forest and the State. Expand CWMA coverage to each Forest. Continue to assess treatment effectiveness visually and enter results into FACTS and NRIS as a NNIP monitoring activity.

Nordhouse Dunes Wilderness Area

Wilderness Management

Is Nordhouse Dunes Wilderness managed in accordance with the commitments associated with its designation?

Monitoring Methods

Wilderness values are monitored through site visits, visitor contacts, and public involvement. Wilderness values, safety messages, and information on the wilderness are emphasized through the Forest Service Nordhouse Dunes brochure, Website, signage outside of the wilderness boundary, and through visitor

contacts made through our offices and in the field.

User satisfaction and the visitor experience of Wilderness is monitored through National Visitor Use Monitoring (NVUM) surveys, which were completed in FY12.

In 2013 an AmeriCorps member worked as a Wilderness Ranger for 10 months in Nordhouse Dunes, nearby Lake Michigan Recreation Area and in the local community. His presence in Nordhouse Dunes increased our education and monitoring efforts. A 2010 campsite inventory is used to monitor recreation site impacts in accordance with national site monitoring protocol. Campsites that are located too close to Lake Michigan and Nordhouse Lake are rehabilitated when located.

The Nordhouse Dunes Wilderness Education Plan was updated in 2010. Wilderness Education occurs through impromptu field contacts where rangers talk with the visiting public, and through formal presentations at school and community groups. Issues discussed include the Wilderness Act, campfires in the wilderness, mechanical use, campsites, fire, crowding, dogs, human waste, endangered species, and preventing the spread of non-native invasive species.

The Nordhouse Dunes Non-native Invasive Species Plan was updated in 2012 and 2013 to include newly discovered species and to include the use of herbicides to treat Lyme grass, Oriental bittersweet, phragmites and established populations of Lomardy poplar. The Forest Service continues to monitor invasive species populations and conduct mechanical treatments to reduce the population of Lombardi poplar and other non-native invasive species in the wilderness.

Forestwide Goals and Objectives –

Public Information and Education: 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.

Use a combination of personal contacts, brochures, maps, and informational signing to inform and educate users about forest management.

Reduce Non-native Invasive Species: Reduce non-native invasive species infestations and prevent new invasive species from becoming established, when possible.

Manage National Recreation Trails, Byways, Rivers, and Wildernesses in accordance with the commitments associated with their designation.

Monitoring Results and Evaluation

Nordhouse Dunes Wilderness management direction in the 2006 Huron-Manistee National Forest Plan was reviewed. The Forest Plan continues to provide adequate direction for management of opportunities for solitude and unconfined recreation experiences.

Management of Nordhouse Dunes Wilderness meets the current minimum stewardship level, as outlined by the 10-year Wilderness Challenge. Emphasis is placed on managing high recreation use levels, abatement of invasive species, and protection of ET&S species.

The data for FY 2012 National Visitor Monitoring (NVUM) indicates that visitors enjoy the time they spent visiting Nordhouse Dunes. Ninety-four (94.3) percent of Wilderness visitors indicated they were very satisfied with the developed facilities, 97.6 percent stated a feeling of safety; 95 percent were satisfied with the value paid, 87 percent of visitors are satisfied with the services and 92 percent were satisfied with access to the Wilderness. Results for crowding rates were also very good. From a scale of 10 (overcrowded) to 1 (hardly anyone there), over half the visitors rating crowding between 2 and 4; only 2.4 percent gave an index of 9, 0 percent gave an index of 10.

Non-native invasive species were treated with mechanical and herbicide (specific species) and a decline of spotted knapweed in areas treated for several years has been noted.

The presence of an AmeriCorps Wilderness Ranger has significantly increased our public education and monitoring efforts. Through these efforts, managers are now aware of an increase in illegal tree cutting for firewood.

Current conditions are consistent with laws and regulations.

Recommendations

Continue to evaluate wilderness management against the goals and objectives for the Forest Plan to determine priorities.

Visitor use is continually monitored and protection of wilderness values will continue to be an interdisciplinary effort. Two Wilderness rangers will be dedicated to work in the wilderness and on wilderness issues in FY14, with a special emphasis on public education and awareness surrounding the 50th anniversary of the Wilderness Act. These stewards will continue to monitor visitor use and focus on public education.

Au Sable River, National Scenic River

Wild and Scenic River Management

Are the designated segments of the Pine, Pere Marquette, Manistee, Bear Creek and Au Sable Wild and Scenic Rivers managed in accordance with the commitments associated with their designation?

Monitoring Methods

Outstanding Remarkable Values identified with each

designated Wild and Scenic River are described in each Corridor River Management Plan (CRMP) and are monitored through interdisciplinary efforts. Public inquiries and comments regarding the management of all designated rivers that the forests receive through the forests website, phone calls and office visits are reviewed.

Water temperatures below the impoundment on the Au Sable River are monitored by Consumer's Energy as part of the FERC agreement.

Dispersed camping opportunities along the Manistee River are monitored for resource damage and visitor safety. A seasonal employee dedicated to the river sites monitors this during the summer and fall. Camping along the Pine and Pere Marquette rivers is only allowed at designated campgrounds; no dispersed camping is allowed within the corridors.

Visitor use is monitored through site visits, visitor contacts, and communication with partners and commercial permit holders. Recreation use during the peaks season (Labor Day through Memorial Day weekends) is monitored for the Pine and Pere Marquette Rivers through a watercraft permit system. Commercial outfitting and guiding use on the Pine, Pere Marquette, Au Sable and Manistee Rivers is monitored through permit administration, river and landing compliance checks and through use allocations.

Monitoring Results and Evaluation

Wild and Scenic River management direction in the 2006 Huron-Manistee National Forest Plan was reviewed. The Forest Plan continues to provide adequate direction for management of the five designated rivers. The Comprehensive River Management Plans (CRMP) associated with each river were reviewed. The CRMPs for the Pere Marquette, Pine, Bear Creek and Manistee Rivers continue to provide adequate direction for the management of those rivers.

The Au Sable CRMP should be updated to reflect a significant increase in personal watercraft use since the current 1989 CRMP was signed. Amendment 4 of the 1988 Forest Plan includes a goal that watercraft use levels do not increase above the estimated 1984 use levels. River use data was collected in FY12 and the findings show that the total estimated use of the four sections from 1984 to 2012, use has risen slightly from 27,342 in 1984 to 28,140 in 2012. The findings also demonstrate use is more evenly distributed along the river.

Two fishing access points along the Au Sable were restored to reduce sediment flow, thanks to partner contribution.

In 2013, due to changes in operations, trash removal at access points managed by other agencies along the Au Sable are has been reduced, creating excess trash along the river.

Gleason's Landing, on the Pere Marquette River was improved to reduce erosion, improve safety of the walk-in boat access point, and improve accessibility. Boardwalks and the walk-in access point from the Pere Marquette at Green Cottage were redone in 2013 with the help of volunteer contribution.

Volunteer and commercial outfitter and guide river cleanup efforts on all five rivers help keep the rivers free from trash. Forest employees provide routine maintenance of all developed and dispersed access points along the rivers. Safety and health issues are identified and improved as quickly as possible.

Public involvement and the process of moving reservations for the private watercraft permit system on the Pine and Pere Marquette Rivers to the National Recreation Reservation System (NRRS) began in 2012. This transition will allow more personnel time to be devoted to working on the river rather than processing permits. This will also improve our customer service to the public, who will be able to reserve watercraft permits 24 hours a day through the NRRS.

Along the Pine River, erosion and safety issues along several sandy slopes have been documented. These issues are the result of people running up the slopes and dragging watercraft up the slopes to slide down into the river.

The official boundaries for the Pere Marquette, Au Sable, Bear Creek and Manistee Rivers were approved by Congress, and published in 2012. As a result, all five designated rivers are maintained to standards established through policy and direction.

Safety messages, float times, facility locations (restrooms, picnic areas, boat launch), watercraft permit policies and State regulations (PFDs) are emphasized through brochures, Website, signage at river landings and overlooks, and through visitor contacts. Brochures for the Pine, Pere Marquette, Au Sable and Manistee Rivers were updated during FY 2012 and FY 2013 and include maps and float times between landings and describe safety regulations and recreation opportunities along the river corridors.

Emphasis is placed on managing high recreation use levels, abatement of invasive species, and protection of Endangered, Threatened and Sensitive species.

Current conditions are consistent with laws and regulations.

Recommendations

Continue to evaluate management of the five designated Wild and Scenic Rivers against the goals and objectives for the Forest Plan to determine priorities. Protecting the designated Outstanding Remarkable Values for each river should continue to be a priority for each river.

Public involvement for updating the Au Sable River Plan should begin in 2014. Accessibility, boat launch and parking improvements are needed at 4001 Landing and can be achieved by implementing the proposed site plan for the landing. Continue to work with partnering agencies that manage access points along the river to improve trash removal on high-use summer weekends.

The private watercraft permit system for the Pine and Pere Marquette Rivers is planned to move to the National Recreation Reservation System (NRRS) in 2014.

Continue to review closure orders and work with law enforcement to manage erosion and safety issues along the Pine River. Review options for reducing the impact.

Cedar Creek Motorsport Trail

Nonmotorized and Motorized Trail Opportunities

Does the Forests' designated trail system provide a range of motorized and nonmotorized recreation opportunities? Is Off-Highway Vehicle use, including snowmobiles, managed to minimize user conflicts and to provide for user satisfaction, resource protection and public health and safety?

Monitoring Methods

User satisfaction is monitored through National Visitor Use Monitoring (NVUM) user surveys. Surveys were completed in FY 2012. Many trailheads were selected as survey sites.

Motorized use for all vehicles, including snowmobiles, has been restricted to a designated trail system since the 1970s. Motor Vehicle Use Maps (MVUM) display the designated motorized trail system (except for snowmobile trails) and have been updated and printed every year since 2008 for the Huron-Shores and Mio Ranger Districts and 2009 for the Baldwin-White Cloud and Cadillac-Manistee Ranger District. Maps are free of charge and distributed at Huron-Manistee National Forests offices and by personnel in the field. An interactive map with MVUM information was also added to the national Forest Service website in FY 2013.

Law Enforcement Officers, with the assistance of Forest Protection Officers, patrol the forest and issue citations for illegal cross-country motorized recreation use and illegal motorized recreation use.

Trail Assessment and Condition surveys (TRACS) are completed on trails every 5 years, as assigned. These surveys incorporate inventory, assessment and prescription into collecting and updating field data. The inventory component accurately identifies basic information about the trail and constructed features along the trail, including key dimensional information, material type, and quantities. Assessment includes an objective evaluation of the current condition of the trails and constructed features compared with Trail National Quality Standards and trail-specific expectations outlined in Trail Management Objectives (TMOs). Prescription is the systematic identification and assignment of tasks needed to meet standard and the TMO.

Nonmotorized and motorized volunteer users and user groups assist the forest, through agreements, with volunteer patrols, trail maintenance and improvements. Forest staff regularly meets and works with these groups to monitor for any user conflicts, concerns or issues that may exist.

The Huron-Manistee National Forests send representatives to statewide trail planning meetings with other agencies and trail partners to discuss current plans, issues, and management of the statewide trail system.

Monitoring Results and Evaluation

The Huron-Manistee National Forests provide for a range of nonmotorized and motorized trail opportunities, as displayed in Table 31.

Table 31Miles of National Forest System Trails, by Designated Use

Use	Motorcycle	ATV	AWD > 50”	Snowmobile	Hiker/ Pedestrian	Pack & Saddle	Cross-Country Ski	*Total*
Miles	180.5	308.4	0.82	687.2	275.0	167.5	147.2	***1,823.9***

Source: USDA-FS INFRA Database, September 2013

The data for FY 2012 National Visitor Monitoring (NVUM) indicates that visitors enjoy the time they spent visiting the Huron-Manistee National Forests. Seventy-seven (77) percent of visitors indicated they were very satisfied and 18 percent indicated they were somewhat satisfied with their experience. Visitor responses for trail conditions, feeling of safety, and visitor information were also given high satisfaction ratings.

When asked to identify what activities they participated in, many visitors responded with activities on trails. For example, 0.9 percent participated in OHV use; 27.6 percent participated in snowmobiling; 0.6 percent participated in cross-country skiing; 4.1 percent participated in motorized trail activity and 22.5 percent participated in hiking/walking. See Table 32for full results.

Table 32 FY 2012 NVUM Activity Participation

Activity	Percent Participating	Main Activity (percent)	Respondents As Main Activity (Total)	Average Time Doing Main Activity (Hours)
Developed Camping	3.1	1.0	32	37.4
Primitive Camping	1.9	0.3	10	18.5
Backpacking	3.0	1.1	52	40.2
Resort Use	2.8	0.0	2	6.0
Picnicking	5.0	0.4	14	1.9
Viewing Natural Features	30.7	13.5	103	2.7
Visiting Historic Sites	3.3	0.3	11	2.1
Nature Center Activities	3.7	0.6	20	1.3
Nature Study	5.9	0.1	5	2.3
Relaxing	33.5	1.9	70	4.2
Fishing	13.3	10.0	134	5.4
Hunting	8.9	7.5	25	4.0
OHV Use	0.9	0.0	0	-

Activity	Percent Participating	Main Activity (percent)	Respondents As Main Activity (Total)	Average Time Doing Main Activity (Hours)
Driving for Pleasure	17.8	2.7	26	3.1
Snowmobiling	27.6	26.8	37	5.6
Motorized Water Activities	1.0	0.9	6	2.9
Other Motorized Activity	0.1	0.0	0	-
Hiking / Walking	22.5	8.0	158	2.4
Horesback Riding	0.1	0.0	54	11.3
Bicycling	2.2	0.3	11	2.5
Non-motorized Water	9.4	6.6	168	4.1
Downhill Skiing	0.4	0.0	0	-
Cross-country Skiing	0.6	0.0	0	-
Other Non-motorized	3.7	0.9	25	2.9
Gathering Forest Products	18.3	15.4	24	3.5
Viewing Wildlife	25.9	2.2	39	2.3
Motorized Trail Activity	4.1	1.6	4	4.3
Some Other Activity	3.8	0.7	14	1.6
No Activity Reported	0.2	0.2	3	-

Source: USDA-FS. FY 2012 NVUM Raw Data (full report not available yet)

Safety is emphasized through vehicle designations, signage, and ensuring trails are maintained to standard. To minimize user conflict, trails are managed for one primary use, and duel, or mixed use (ATV and highway-legal vehicles at the same time) is only permitted where a mixed-use traffic analysis has been completed. Trails are signed to reduce conflict and provide an atmosphere of safe recreation. When needed for resource or safety concerns, trails are rerouted.

During 2013, the Maltby Hills ORV trailhead was closed temporarily due to safety and natural resource concerns.

Trail maintenance on motorized trails (including snowmobile) is primarily accomplished by Forest Service personnel, and trail sponsors (clubs) with DNR grant money through Challenge Cost Share agreements. Nonmotorized trails are primarily maintained by Forest Service personnel with assistance from cross-country ski partners and the North Country Trail Association through volunteer agreements and Challenge Cost Share agreements.

Information on mileage and designated use of the National Forest System of trails is located on the forest Website, through free publications, and at trailheads.

As an added safety measure, many snowmobile, motorcycle and ORV systems have locator maps and codes for quick location (see image below), in the event of an emergency.

Trail condition surveys (TRACS) were completed for 1,600 miles of trail in FY2012 and FY2013, through an ARRA contract. Deferred maintenance identified, such as missing signs, were identified and added to the task list.

Recommendations

The Huron-Manistee National Forests should continue working with volunteer groups, such as the North Country Trail Association, and clubs to maintain trails to standard. The primary emphasis should be on maintaining the existing system. Building new routes that connect communities to existing trails, or connect trail systems are a higher priority than new routes.

The Huron-Manistee National Forests should continue to work with the Hiawatha National Forest, Ottawa National Forest, National Park Service North Country Trail, Michigan Department of Natural Resources, and trail partners to maintain a statewide trail network.

Prioritize entering the 2012-2013 TRACS data into the database of record (TRACS).

Begin the planning process and evaluate alternatives for the Maltby Hills ORV trailhead.

Former Mio Ranger Station

Land Ownership

Adjustments through Purchase, Exchange, Transfer Interchange, Boundary Adjustment, and Donation

To what extent has the Forests' land base been adjusted through purchase, exchange, transfer interchange, boundary adjustment, and donation? What land conveyances, purchases, or exchanges have occurred to: protect T&E or RFSS species, increase public ownership on lakes and rivers, or acquire lands with unique ecological, scientific heritage, recreational qualities?

Monitoring Methods

We are continuing with the Forests' land adjustment program of purchases, exchanges and accepting donations to meet goals of the Forests' Land and Resource Management Plan, as amended. The land adjustment goals set out in the plan are to acquire lands needed to protect endangered, threatened and sensitive species, increase the amount of wetlands, water frontage, and areas possessing unique natural environments or cultural resources.

The Huron-Manistee National Forests continue to utilize the Land Adjustment Data System (LADS) to submit annual reports to the Regional Office on land adjustment cases. This system provides all Forests with the ability to compile and manage information related to the status of land adjustment cases. The system also serves as the reporting source of record for all adjustment related performance measures.

In Fiscal Year 2014, all Forests will begin reporting all [new] title claims, encroachment, and trespass cases utilizing the Title Claims and Encroachment Management System (TCEMS). The TCEMS will serve as the reporting source of record for these cases which will include land adjustments through conveyance pursuant to the Small Tract Act.

Monitoring Results and Evaluation

The Huron-Manistee National Forests continue to see a definite shift in program emphasis from that of land adjustment to that of land use – primarily attributed to: decreasing availability of purchase dollars, reduced timber receipts for land-for-timber exchanges (tripartite), high cost of processing land exchanges, and an increased demand for use of National Forest System lands.

The Forests receive many more land ownership adjustment proposals than current budgets and staffing can accommodate. These proposals are from non-federal landowners offering the U.S. to either purchase their land or consolidate NFS lands through exchange. As these new opportunities for land adjustments are presented, the Forests continue to prioritize projects and emphasize cases that provide restoration or conservation opportunities, improved public access for recreational purposes, increase management efficiency through land ownership consolidation or resolution of real property encroachments. While the screening and prioritization

may result in fewer cases being initiated compared to the opportunities presented, it ensures that Forest Plan objectives and Agency goals are being addressed and met.

In Fiscal Year 2012, two (2) land ownership adjustment cases were completed.

Acquisition of 40.08 acres through a Land-for-Timber Exchange

The acquisition was competed utilizing timber sale receipts ($60,000) from the "Briar Hills" and "Banking Ground" timber sales in Wexford County and the "Cooper Jack" timber sale in Mason County.

The tract acquired was completely surrounded by National Forest System lands and within 2 miles of Nordhouse Dunes Wilderness Area. The tract is located within Management Area (MA) 4.3, Roaded Natural Wetlands, as identified in the Huron-Manistee National Forests Land and Resource Management Plan, as amended (Forest Plan). It is also within a grouse management area and acquisition allows management for early successional species. In addition, acquisition conserves habitat for Golden-winged warbler, Red-shouldered hawk and sandhill cranes.

The tract is essentially level with a high water table, semi-open with a mixture of aspen/birch and shrub/swamp wetlands with scattered white pine throughout.

Acquisition of this tract resulted in a decrease of one (1) mile of Forest boundary line and eliminated the need to set three (3) section sub-divisional corners.

Acceptance of a 46 acre donation from The Nature Conservancy (TNC)

TNC acquired the property in 1998 and approached the Forest Service in 2007 about a possible donation. TNC indicated they would like to see the property become part of the National Forest System to be enjoyed by the public. The donation took several years to complete because of complicated title issues that TNC needed to resolve prior to the Forest Service accepting title.

Since the property was acquired by donation, the property value was not established by an appraisal approved by the Forest Service. Based upon values of similar properties in the area, TNC estimated value of this tract to be approximately $80,000.

The tract is located along the southern boundary of the Huron National Forest and within the Mio Ranger District. The tract had National Forest System lands along its north and east boundary. It is within MA 2.1, Roaded Natural Rolling Plains and Morainal Hills.

The property is a mixture of maple, beach and ash forest. Approximately one-third of the parcel is an old field, which is transitioning into a young forest. There is little sign of exotics or alterations on the parcel and it appears to be very similar but slightly younger than adjacent National Forest System lands.

Acquisition of the parcel did not result in a net change to the amount of property boundary needing to be posted.

In Fiscal Year 2013, one (1) land ownership adjustment cases was completed.

Conveyance 1.75 acres out of Federal ownership (former Mio Administrative Site)

The Huron-Manistee National Forests currently have approximately 15 administrative sites with over 100-structures. Due to reorganization and the combination of District Offices, the Forests have been left with multiple administrative and work centers that are no longer necessary. The former Mio Administrative Site is located within the City of Mio; surrounded on all sides by non-federal land. The facilities were used as the Mio District Office until construction and occupancy of the new office in 2007. Since moving into the new office, the subject buildings have been vacant. The site is located within MA 4.4, Rural.

The agency determined that the buildings and land associated with the administrative facility portion of this site (office, warehouse, and gas/oil/storage) were no longer necessary for forest management purposes and should be conveyed out of Federal ownership. If the site was not conveyed, the Forest Service would continue to have a management and maintenance responsibility for vacant Federal facilities on an isolated tract of Federal land.

Conveyance of the site was conducted pursuant to the Forest Service Realignment and Enhancement Act of 2005 (P.L. 109-54). The form of consideration for the conveyance was a competitive sale. Specifically, the conveyance was accomplished through a General Services Administration (GSA) sealed bid auction. The site was sold for a total of $62,500. The conveyance resulted in a reduction in Forest acreage of 1.75 acres.

Table 33 Buildings associated with the property conveyed:

Building	Year Constructed	Square Footage
Office (INFRA #49601)	1956	2,400
Warehouse/Storage (INFRA #49608)	1955	3,520
Gas/Oil/Storage (INFRA #49609)	1956	167

Recommendations

As of September 30, 2013, the net acreage of the Huron-Manistee National Forests was 978,996 acres. The breakdown is as follows: Manistee National Forest – 540,369 acres and the Huron National Forest – 438, 627 acres.

The Forests will continue to evaluate land adjustment proposals against the goals and objectives for the Forest Plan to determine priorities.

In addition to meeting the goals and objectives of the Forest Plan, land adjustment proposals will also be evaluated based on: 1) how well they rank in meeting the adjustment criteria identified by the Forest Service Washington Office, 2) the threat of development posed by not completing the acquisition, and 3) how likely the acquisition is to be successfully completed based on other proposals submitted.

Research Natural Areas – Establishment Records

Are areas with unique character protected?

Monitoring Evaluation

Research Natural Areas (RNAs) are supposed to provide a network of high-quality ecosystems for research, monitoring, and education. They serve as reference areas for documenting ecological processes and baselines for evaluating the effects of manipulative research and management practices. RNAs also fill an important niche in biological conservation and natural community protection. Prior to completion of the 2006 Forest Plan, three Research Natural Areas (RNAs) had been established within the Forests, including Nordhouse Dunes, Newaygo Prairie, and Hayes Tower.

Brandybrook

Candidate RNAs are areas to be evaluated for possible designation as RNAs. The 2006 Forest Plan identified 18 additional cRNAs.

In 2008-2009, a joint NF Eastern Region and Northern Research Station Committee (Nowacki et al 2008) conducted a region-wide assessment of all cRNA's to help identify those proposed RNAs of greatest value for establishment purposes. In 2010, revised national direction (FSM 4063) reaffirmed the agency's dedication to RNAs.

Recommendations

Of the 18 cRNAs recommended in the 2006 Forest Plan, the region-wide assessment resulted in the recommendation of 10 to become established RNA's (Table 34). Those cRNA's that were not selected for establishment will be designated to other appropriate management area(s) such as Special Management Areas (SMA's) or Old Growth (OG) as soon as possible, such as at the time of the next forest plan revision.

Table 34 Proposed cRNA and Final RNA Selection.

Site	2006 Forest Plan Proposed Designation	Final Selection & Eventual Designation
Bear Swamp	cRNA	RNA
Big South	cRNA	RNA
Black River Complex	cRNA	RNA
Blockhouse Swamp/Creek	cRNA	RNA
Brandybrook	cRNA	RNA
South Olga Bog	cRNA	RNA
O'Brien Lake Forest/Swamp	cRNA	RNA
Vaughn Lake	cRNA	RNA
McDonald Creek Forest	cRNA	RNA
Trout Lake Swamp	cRNA	RNA
Hunter's Lake	cRNA	SMA or OG

Site	2006 Forest Plan Proposed Designation	Final Selection & Eventual Designation
Loon Lake	cRNA	SMA or OG
Loud Creek	cRNA	SMA or OG
McMaster's Bridge	cRNA	SMA or OG
North Branch White River	cRNA	SMA or OG
Pearl Lake	cRNA	SMA or OG
Toft Lake	cRNA	SMA or OG
South Branch (Foley) Bog	cRNA	SMA or OG

Of the 10 areas selected in Table 41 as eventual RNAs, an approved comprehensive establishment record is required for each cRNA. An establishment record consists of specific flora and fauna surveys, land surveys, and other data and information. It is the intention of the Forests to complete the 10 establishment records pending the necessary funding to accomplish them.

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