



Chippewa National Forest

**Monitoring
and
Evaluation Report
FY 2014**

**USDA Forest Service • Eastern Region
Milwaukee, Wisconsin
August 2015**

**For More Information:
Sharon Klinkhammer
Chippewa National Forest
200 Ash Avenue, NW
Cass Lake, MN 56633
218.335.8660
sklinkhammer@fs.fed.us**



FISCAL YEAR 2014 MONITORING AND EVALUATION REPORT

APPROVAL AND DECLARATION OF INTENT

I have reviewed the FY 2014 Monitoring and Evaluation Report for the Chippewa National Forest that was prepared by forest employees. I am satisfied with the findings and intend to consider recommendations made during project development and plan revision. The Monitoring and Evaluation Report meets the intent of both the Forest Plan (Chapter IV) as well as the 36 CFR 219.

This report is approved:



DARLA LENZ
Forest Supervisor

Date 10/22/15

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotope, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at http://www.ascr.usda.gov/complaint_filing_cust.html and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: program.intake@usda.gov.

USDA is an equal opportunity provider, employer and lender.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	ES-1
CHAPTER I: INTRODUCTION	I-1
CHAPTER II: RESOURCE REPORTS	
1. Tribal Rights and Interests	1-1
2. Timber.....	2-1
3. Regeneration.....	3-1
4. Wildlife and Plants.....	4-1
5. Insects and Disease.....	5-1
6. OHV.....	6-1
7. Transportation Management.....	7-1
8. Watershed Health & Riparian.....	8-1
9. Soils.....	9-1
10. Unit Monitoring.....	10-1
11. Fire & Fuels.....	11-1
12. Costs.....	12-1
13. Heritage Resources.....	13-1
14. Climate Change.....	14-1
15. Species Composition, Age Class Distributions and Objective	15-1
III. FOREST PLAN AMENDMENTS AND CORRECTIONS	III-1
IV. PREPARERS.....	IV-1

Executive Summary

The following information consists of key points from resource areas included in this Monitoring and Evaluation Report for fiscal year 2014. More detail that supports these statements can be found in the document.

1. Tribal Interests and Rights

- The Forest continues its efforts to uphold Federal Trust responsibilities. A Memorandum of Understanding (MOU) signed by LLBO and the CNF expresses the will of each to work together to conserve resources significant to the Band's way of life and cultural identity. The Forest has funded a Tribal Liaison position; provided employment opportunities; interacts with tribal program staff in an effort to work in a government to government manner; and protects tribal lands, assets, resources, and rights in land management decisions to sustain American Indian's way of life.

2. Timber

- The Forest is meeting assigned timber targets for volume sold even though acres harvested are below Forest Plan estimates
- Ratio of sawtimber to pulpwood (23:77) is lower than proposed for decade 1 in the Forest Plan (32:66). Further, the goal for Decade 2 increases this ratio to 43:57. An increase in sawtimber percentage will be difficult to achieve based upon current harvesting prescriptions and management direction.
- The northern long-eared bat was listed as threatened with the 4(d) interim rule. The final rule is anticipated in January 2016. It is unclear if this listing will place additional restrictions on summer harvest and if that will have an impact on timber sale marketability and stumpage prices.
- The Forest should continue to utilize stewardship contracting and consider Good Neighbor Authority as a tool to accomplish restoration work.

3. Regeneration

- Adequate restocking of regeneration harvest stands was met on 52.3% of the acres harvested in FY 2009 by the end of FY 2014.

4. Wildlife and Plants

- In 2014, all management activities were completed within 2004 Forest Plan direction for Regional Forester Sensitive Species. Projects that were analyzed either had no impact or were not likely to cause a trend to federal listing or loss of viability on the Chippewa

National Forest. In addition, all Forest Plan Standard and Guidelines were successfully implemented on the ground.

- In 2014, the Forest contributed toward the conservation and recovery of both the Canada lynx and gray wolf through habitat and access management practices, collaboration with other federal and state agencies, as well as researchers, tribal bands and non-governmental partners.
- The Forest also initiated a partnership with the Superior NF, University of Minnesota and Minnesota DNR in learning more about the status of the Northern Long Eared Bat which was listed as a threatened species in April of 2015.
- The Monitoring and Inventory Survey Team continued to make improvements to the screening process in surveying various RFSS on the Forest. This improved screening process has made the surveys on the Forest more effective in detecting locations of RFSS. The consistent increase of new locations added each year also suggests an improved understanding of where and when to search for these species.
- Breeding bird community appears to be in excellent condition with the vast majority of species trends increasing or stable. Some concerns exist for declining population trends for the Connecticut Warbler.
- Hand and mechanical treatments of NNIS appeared to be effective. In contrast, biocontrol release sites were not very successful. Continue NNIS treatments and monitoring efforts.

5. Insects and Disease

- Tamarack is being damaged by eastern larch beetle and larch casebearer. Both insects are on the increase in recent years but have caused damage since 2004. A review of the tamarack resource for possible management actions is recommended.
- The Forest is being proactive through coordinated partnerships and research projects in hopes of building ecosystem resilience and slowing the spread of emerald ash borer (EAB) once it arrives.

6. OHV

- Public education and information is critical to successfully manage OHV use within the Forest and reduce illegal use.
- Through collaboration with the counties and MnDNR, ongoing analysis is completed that identifies additional OHV riding opportunities and also identifies areas to be closed to OHVs.
- There continues to be a workload associated with identifying roads to be opened or closed to OHV use and roads to be decommissioned.

7. Transportation Management

- New system road construction has been virtually nonexistent in the past decade. Emphasis has been on decommissioning roads to reduce road miles.
- Coordination with local highway departments emphasizes safety on roadways with improved maintenance and provides a seamless interface with the neighboring public road agencies based on coordinated use, function and agency goals.

8. Watershed Health and Riparian

- Impoundments are being removed to address quality concerns, restore aquatic organism passage and connectivity, and address safety issues.
- Monitoring of removals and improvements indicate that fish passage, connectivity, and aquatic objectives are being met.

9. Soils

- Forest Plan Standards and Guidelines are being met.
- Expand monitoring to include long term monitoring and soil disturbance pre and post treatment.

10. Unit Monitoring

Monitoring of treatment units from the July 2012 wind storm indicated the following:

- Complexity and scale of the project, limited stand data and site information at the time of planning, and changing personnel, appears to have limited understanding and follow through of project's restoration objectives.
- Generally treatments planned were appropriate, realistic, and implementable.
- Soil was adequately protected.
- Wildlife objectives for green reserve trees and snags were met given blowdown conditions and limitations in units treated.
- Fuels reduction activities along roads on the Pike Bay Experimental Forest appeared adequate.
- At the time of implementation there were changes in treatments that were not consistent with project objectives and expected outcomes. Coordination with the District Ranger and IDT regarding changes needs to occur. Concerns noted:
 - Treatment changes may not fall within the effects disclosed for the project.
 - Project objectives such as restoring fire to the landscape or forest type conversions may be compromised or not achieved.
 - Social perspective and context for commitments the Line Officer made to external groups and the need to follow-up with them was overlooked.

11. Fire and Fuels

- The Forest is meeting hazardous fuel reduction objectives for wet meadow and upland burning. Wet meadow treatments have been successful in reducing the number and size of person caused fires. The upland burning program is successful in reducing the fuel loading that contributes to increased fire behavior in wildland fire situations. In addition, these burns accomplish objectives for wildlife habitat improvement and restore fire to a fire dependent pine ecosystem.
- Fire statistics show person caused fires are the main cause of wildland fires on the Forest. These fires result in the most acres burned.
- The Forest Plan does not allow for the management of wildland fire for resource benefit, and thus all wildland fire is deemed to be unwanted wildland fire and actively suppressed to protect life and natural resources.

12. Costs

- Costs of site preparation, planting, and seeding today are much higher than used in Forest Plan revision. Establishing jack pine is substantially more expensive than anticipated.
- Grants and agreements make an important contribution to provide work opportunities and to achieve resource accomplishments.
- Joint Chiefs Upper Mississippi Headwaters Restoration Project has increased collaboration and partnerships across all ownerships and resulted in the accomplishment of several successful projects.

13. Heritage Resources

- Mitigation and avoidance standards are effective in protecting heritage sites.

14. Climate Change

- The Spruce and Peatlands Response Under Climate and Environmental Change (SPRUCE) project looks at the responses of peatland ecosystems to changed climate.
- Adaptive Silviculture for Climate Change (ASCC) on the Chippewa National Forest is in the early phases of development. It will look at responses of silvicultural treatments to resistance, resilience, and adaptability to climate change.
- Another cooperative study looks at managing black ash forests in the face of emerald ash borer (EAB) and climate change. Preliminary results indicate that group selection harvest coupled with a planting strategy appear to be a viable technique to convert the black ash stands to a different composition while minimizing risks of altered hydrology.

- The ongoing development of the LANDIS II model supports the Northwoods Ecosystem Vulnerability Assessment for the Chippewa NF.
- The Forest is addressing forest adaptation for climate change in our major vegetation projects using an approach in *Forest Adaptation Resources: Climate Change Tools and Approaches for Land Managers* (Gen Tech Rpt NRS-87, 2012) and Minnesota Forest Ecosystem Vulnerability Assessment and Synthesis: A report from the Northwoods Climate Change Response Framework Project (Gen Tech Rpt NRS-133, 2014).
- In 2014 the Forest achieved seven “Yes” answers on the Climate Change Scorecard, up from 5 in 2013.
- In 2014, the Chippewa National Forest co-hosted a Climate Informed Forest Management Forum and Field Day.
- The Forest restarted its Climate Response Charter Team to help further efforts to position ourselves in the face of Climate Change.

15. Species Composition, Age Class Distributions and Objectives

- We were below the Decade 1 objectives for the amount of 0-9 age class, even with the blowdown event of 2012. This trend continues into decade 2 which takes into consideration treatments that are planned and under decision but have yet to be harvested. This trend holds true for all the LEs. The focus on commercial thinning of red pine stands contributes in part to these results.
- Conversely, the amount of mature/older on the landscape has steadily increased and exceeds decadal objectives for all the LEs.
- Jack pine and spruce-fir forest types are well below decadal objectives and contribute to an overall decline in the amount of conifer on the landscape, a concern noted for conifer dependent birds. Both jack pine and spruce fir forest types are expected to decrease according to climate change model projections.
- Amount of aspen on the landscape has declined since 2004 yet still exceeds the objectives for all LEs. Additional decreases in aspen are desired. Aspen is also a species expected to decrease with climate change.
- Northern hardwoods exceed objectives due to stand re-delineation and typing and recent stand data. Further increases in this forest type are expected due to regeneration treatments that promote the release of young hardwoods in stands.
- Jack pine, spruce-fir, red pine, and aspen are projected to decrease on the landscape according to climate change models.

I. INTRODUCTION

This report is compiled under the 2004 Chippewa National Forest Plan which was signed by Regional Forester, Randy Moore, on July 30, 2004. The Monitoring and Evaluation Report covers the monitoring activities, results and recommendations for Fiscal Year 2014.

This report uses as its framework Monitoring and Evaluation as described in Chapter IV of the 2004 Forest Plan. This chapter provides a list of monitoring questions tied to resource areas to be evaluated. There are also legally required monitoring items that include specific compliance requirements. Reference to Chapter IV of the Forest Plan will provide a more complete overview and details.

In addition to the information summarized and presented in this report, the data compiled, methodologies used, and supporting documents are part of the project file and are available upon request at the Supervisor's Office in Cass Lake, MN.

Chapter II consists of a report summary for the resource areas. Each resource section has the following discussion:

- **Monitoring Question.** This question is the same as identified in Chapter 4 of the Forest Plan. The questions are tied to monitoring drivers that consist of the desired conditions, objectives, standards and guidelines specified in the Forest Plan for that resource. The monitoring drivers are not included in this report but can be found in the project file. Similarly, the monitoring methods are in the project file. They consist of methods used, locations, timing, and processes of monitoring data collection.
- **Results.** This section captures the progress in implementing Forest Plan direction, reaching objectives, goals, desired conditions and producing goods and services. This section may also address the effectiveness of standards and guidelines, specific management practices, design features, or mitigation measures.
- **Implications.** This section discusses the interpretation of the data and describes what the results mean.
- **Recommendations.** Identifies recommendations for ongoing or future projects, particularly if there is a shift or adjustment in direction. Included are any potential changes to existing Forest Plan direction.

Chapter III addresses amendments and corrections to the Forest Plan. A complete listing of all the changes made since 2004 are provided.

Chapter IV is a list of the Forest Service employees that provided information contained in this report. The report incorporates information gathered by resource specialists for the most part from the Chippewa National Forest.

This report and past reports are posted on our Forest website:

<http://www.fs.usda.gov/detail/chippewa/maps-pubs>.

II. RESOURCE REPORTS

1. Tribal Rights and Interests

This section includes three monitoring questions related to tribal rights and interests. The first addresses sustaining American Indian's way of life, followed by a discussion on our government to government relationship, and finally some information on facilitating the right of the Tribes to hunt, fish, and gather.



Official emblem & flag
www.llobjibwe.org

Approximately 43% of the National Forest Lands are within the Leech Lake Reservation boundaries. Nearly all Leech Lake Reservation lands are located within the proclamation boundaries of the Chippewa National Forest. Eleven Indian communities make up the Leech Lake Reservation and all are within the proclamation boundary of Chippewa National Forest.

Key Points

- The Forest continues its efforts to uphold Federal Trust responsibilities. A Memorandum of Understanding (MOU) signed by LLBO and the CNF expresses the will of each to work together to conserve resources significant to the Band's way of life and cultural identity. The Forest has funded a Tribal Liaison position; provided employment opportunities; interacts with tribal program staff in an effort to work in a government to government manner; and protects tribal lands, assets, resources, and rights in land management decisions to sustain American Indian's way of life.

Monitoring Question

Is Forest management helping to sustain American Indians' way of life, cultural integrity, social cohesion, and economic well-being?

Background

There are numerous locations throughout the Forest that have traditional, cultural, and spiritual significance to the LLBO. The use and protection of these areas is a way of maintaining traditional links to past generations.

The continued availability of traditionally utilized natural resources is crucial to Ojibwe culture. Now, as in the past, many places throughout the landscape are visited during a yearly cycle to collect food, medicinal plants, and other materials, as well as for religious practices and social gatherings. Plants and animals gathered from openings, aquatic environments, and forests

provide sustenance. The traditions of gathering these and other natural resources continue to be economically and spiritually important. Because of their concern with the continuation of this aspect of Ojibwe culture, the Band takes an active role in the protection and restoration of many species of plants, animals, and fish. The Band also asserts that access to these resources and traditional cultural places is an inherent right.

Results

The Forest Service has worked with the tribe in a variety of ways to improve the American Indian’s way of life, cultural integrity, social cohesion and economic well-being. This has been primarily through contracts and agreements to help support local crew work through stewardship contracts, grants and agreements, and training. We have also coordinated with the Tribe by providing training, working together to complete ecosystem restoration, prescribed burning, impoundment management, road maintenance, management of heritage resources, lands review, and public affairs.

Stewardship Contracts

- A major accomplishment was the execution of a Master Stewardship Agreement signed with the LLBO in May. This agreement paves the way to expand our partnership opportunities with the tribe.
- The FS collaborated with LLBO on a stewardship contract named Tall Meadows. This integrated resource timber contract (IRTC) includes the removal of timber in exchange for a variety of service work on the Forest. The service work includes roadside brushing, forest road restoration including roadbed reconditioning, grading, spot gravel, culvert placement and fill.

Grants and Agreements

The following table displays some of the various grants and agreements with LLBO some of which have been in place for several years.

Table 1-1. Various agreements with LLBO.

TYPE OF AGREEMENT	PURPOSE OF AGREEMENT/RESULTS
Participating	Tree Planting
Participating	Internship Agreement with Tribal College.
Participating	Non-native Invasive Plant Species Management
Stewardship	Master Stewardship Agreement
Participating	Berry Patch Restoration – Non-Forest Service Lands
Participating	Egg Lake Restoration Project
Participating	Roadside Hazardous Fuels Reduction

Participating	Hazardous Fuels Reduction -- Onigum
Participating	Impoundment Maintenance
Cooperative Agreement	Road Maintenance
Participating	Heritage Surveys
Participating	Illegal Dump Cleanup
Sec 106 Powerline	Section 106 Powerline mitigation activities

In FY 2014 the Forest through new agreements provided a total of \$327,452 in funding to the Leech Lake Band to implement projects or deliver services on the Forest. A cooperative match returned to the Forest totaled \$ 201,673.

Training

- An Agreement with Leech Lake Tribal College enables the Forest to hire student interns. In 2014, an intern was hired to work with the Forest’s GIS personnel. The agreement’s goals of providing work experience and technical skill enhancement were met through this successful internship.

Ecosystem Restoration

- The FS and LLBO worked together in planting red and white pine seedlings in blowdown damaged areas on the Forest. The LLBO Day Labor Program planted approximately 50 acres in 2014.
- The LLBO continued to work on Hazardous Fuels projects commonly known as “Stevens’ Funds “. The \$225,000 Onigum Vicinity Hazardous Fuels Reduction Fuels Project grant is currently in the process to treat 580 acres in the Onigum area of the Leech Lake Band of Ojibwe Reservation. This project includes thinning, brushing and possibly prescribed burning.
- The Forest has trained and employed Band members in the identification and eradication of invasive plant species. The crew received training on identification of various invasive plant species, as well as observing exotic earthworm infestations at sites across the forest. The crew conducted hand and mechanical invasive plant control treatment on both Tribal and National Forest lands.
- Other tasks completed by LLBO included transplanting sweetgrass from a garden site at Camp Rabideau to appropriate new locations and habitat.

Prescribed Burning

- LLBO participated with Forest crews while prescribed burning at Federal Dam and in several other prescribed burning projects.
- LLBO provided staffing during high fire danger occurrences.



- LLBO is working on a Forest Service funded Community Wildfire Protection Plan for the Reservation.

Impoundments

- LLBO crews helped decommission the south dam at Pine Tree Impoundment and the Loon Impoundment in October 2013.
- LLBO crews helped facilitate an emergency drawdown of the Highway 6 Impoundment in October 2013.
- LLBO crews coordinated topsoil placement and re-seeding at Welch Lake.
- For the Egg Lake Impoundment project, we coordinated with LLBO crews on issues such as material orders and provided general project coordination leading up to construction.
- LLBO crews were hired to perform routine maintenance work at Goodman and Holland Lake Impoundments.



Road Maintenance

- LLBO coordinated spring and fall 2014 rounds of cleanup work under the illegal dump cleanup agreement.
- During FY14, we worked with LLBO to create a new 5 year road maintenance agreement to blade and snowplow many roads.
- A number of stewardship road proposals, including road re-establishment, blading, etc. were completed.
- Brushing along several FS roads to reduce hazardous fuels was completed.
- LLBO assisted with road work in response to emergency flooding early in the summer 2014.
- FS assisted LLBO with emergency culvert supply when they had a drainage issue.

Heritage Resources

- Heritage Surveys agreement was signed for LLBO to do archaeological surveys of four vegetation management projects, an archaeological survey of Knutson Dam project, and Sec. 110 archaeological survey of Cut Foot Sioux area.
- Section 106 consultations with the Tribal Historic Preservation Office (THPO) included vegetation management projects such as Adaptive Silviculture for Climate Change, alder and mountain maple shearing projects; special use permits for recreation resident/resort projects; infrastructure projects including Portage Creek Bridge replacement, West Winnie Boat Launch, and Capital Christmas Tree.
- Forest prepared ARPA permits for LLBO to do archaeology on NF lands for third party.
- Forest Staff gave a Forest History presentation to a Leech Lake Tribal College class.

- Programmatic Agreement prepared by Forest pertaining to Section 106 with THPO, SHPO, USACE, and MnDOT relative to the MN Hwy 2 passing lanes project was signed by all parties and is in effect.
- Forest conducted research briefings and correspondence in preparation of assuming lead control of a collection of human bone likely recovered from CNF lands within the boundary of the Leech Lake Reservation.
- Birch Bark scrolls found by member of public were returned to Minnesota Indian Affairs Commission representative.

Lands/Recreation

- The Forest assisted LLBO with review of nearly 17,000 acres of NFS lands acquired through Secretarial Transfer Authority. LLBO is pursuing Legislation to transfer the parcels from National Forest System status to Indian Trust Lands.
- Special Uses staff and LLBO staff completed a field visit in June to an expired special use permit site used as a Cultural Learning Center on Lake Winnibigoshish. LLBO determined they do not want to renew the permit at this time.
- The Forest accommodated free camping for tribal members as requested and coordinated with Forest Recreation staff.
- LLBO held two youth program events at the Forest's Norway Beach Recreation Area in June and August of this year.
- Forest consulted several times with LLBO staff on the MN Highway 2 Environmental Assessment project as well as attended LIC meetings to update them on the project.
- The Forest accommodated a tribal wedding at Camp Cassaway on Cass Lake in May.

Public Affairs

- The Forest Public Affairs Office worked closely with the Leech Lake Band of Ojibwe with regard to the coordination of the 2014 U.S. Capitol Christmas Tree. By building on current relationships, we were able to generate significant connections to both governments and programs.
- Staff conducted interpretive programs with Leech Lake Tribal College utilizing a grant for public outreach and cultural activity engagement.

Tribal Forest Protection Act

- Forest staff consulted with the LLBO Department of Resource Management in the development of a Tribal Forest Protection Act (TFPA) proposal that would encompass thinning of red pine stands for purposes of achieving fuels reduction, ecosystem restoration and mitigation of bark beetle infestation.

Monitoring Question

Are government to government relationships functional?

Background

Consultations occur on National and Regional issues and on local Forest projects. The Director of the Division of Resource Management is authorized by Tribal Council Resolution to serve as the point of contact for the Leech Lake Band on all matters concerning the Forest Service.

Results

- The Forest consulted with LLBO on the development and execution of a Joint Memorandum of Understanding (MOU) concerning firewood gathering that will be executed in FY 2015. The Forest also conveyed information regarding revisions to the Tribal Relations Directives and Ground Water Resources Manual.
- The Tribal Relations Strategy provides Forest employees with tips and resources about consultation and processes used regularly between the Forest and LLBO.
- With regard to the major vegetation management projects on the Forest, consultations are a matter of routine business. Planning team members and Line Officers meet with DRM and attend Local Indian Council (LIC) meetings to provide and solicit information from tribal communities on Forest projects.
- Consultation occurred on major vegetation projects that include Laurentian Vegetation Management, Adaptive Silviculture for Climate Change, Rabideau Civilian Conservation Camp Management, Knutson Dam Improvement, Farley and Shingobee Vegetation Management projects, Marcell South Snowmobile re-route, and the MN Hwy 2 Improvement Project.
- The Forest Line Officers and Team Leaders hold quarterly coordination meetings with the Director and DRM Staff. They address emerging issues, updates and priorities within each agency's fire, forestry, watershed, wildlife, botany, and heritage programs.
- Turnover in the leadership/administration within the Forest Service and the Leech Lake Band often create set-backs in our relationship. The Chippewa Tribal liaison position has been an asset with about 30-40% of a full time position devoted to liaison responsibilities. With the retirement of Forest's Tribal liaison, alternative approaches are being considered and will likely go into effect in 2015.

Awards

- In 2014, the Forest received the National Tribal Relations Partnership Award. This award was given jointly to both the Forest and the LLBO. The award recognized the significance of the partnership projects between the Forest and the Tribe.

Training

- The Forest provides for formal training on Tribal Law and Rights to new members of the Forest Leadership team (FLT). Blackduck district employees and the FLT also received training and information on treaty Rights and Trust Responsibilities from Larry Heady, Regional Tribal Relations Specialist.

Monitoring Question

Is the Forest facilitating the right of the Tribes to hunt, fish, and gather as retained via Treaty?

Results

Information provided for the previous monitoring questions contribute to facilitating the right of the Tribes to hunt, fish, and gather.

Fruiting Shrub Planting Coordination

Fruiting shrubs were planted on both Chippewa National Forest and Tribal lands. A total of 13 acres were planted that will enhance future berry picking opportunities for the LLBO.

Prescribed Burning Coordination

Prescribed burning near Six Mile Lake in red pine stands was done with the intent of increasing the potential for blueberries. Previous prescribed burning in red and white pine stands east of Sucker Lakes resulted in an abundance of blueberries. This site was a popular picking area in 2014.

Firewood Gathering Coordination

In FY 2014, the Forest and DRM met on several occasions to develop the wording for a tribal firewood ordinance. The ordinance is being reviewed by the LLBO legal staff and is planned for consideration by the Tribal Council. In addition, the FS and DRM have been working on a Tribal Firewood MOA as part of our more comprehensive MOU.

Forest Timber staff has been working with LLBO to provide areas for firewood collection by the Day Labor Program. During the late winter of 2014, adjustments were made to an existing timber sale to allow access and slash for firewood gathering by Band members. The Day Labor Program has been harvesting firewood from storm damaged trees on the 80 acre Supervisor's Office complex for processing at the Day Labor work site in Cass Lake. This firewood is used by tribal elders for heating purposes.

In FY 2016, it is anticipated that the tribal firewood ordinance will be passed and the tribal firewood MOA will be signed and in place.

Recommendations

- Continue to work with the Leech Lake Band of Ojibwe and employees of the Forest to strengthen cultural awareness, consultation, communication, employment and outreach, partnerships, and resource management.
- Continue efforts that facilitate greater involvement of all Tribal members in FS programs and activities afforded the general public.
- Continue connecting leaders from both governments to help address key issues that may have potential to disrupt relations.

2. Timber

Key Points

- The Forest is meeting assigned timber targets for volume sold even though acres harvested are below Forest Plan estimates.
- Ratio of sawtimber to pulpwood (23:77) is lower than proposed for decade 1 in the Forest Plan (32:66). Further, the goal for Decade 2 increases this ratio to 43:57. An increase in sawtimber percentage will be difficult to achieve based upon current harvesting prescriptions and management direction.
- The northern long-eared bat was listed as threatened with the 4(d) interim rule. The final rule is anticipated in January 2016. It is unclear if this listing will place additional restrictions on summer harvest and if that will have an impact on timber sale marketability and stumpage prices.
- The Forest should continue to utilize stewardship contracting and consider Good Neighbor Authority as a tool to accomplish restoration work.

Monitoring Question

To what extent does output levels and location of timber harvest and mix of sawtimber and pulpwood compare to those levels projected?

In response to this monitoring question, several different monitoring indicators will be presented. These include timber target, volumes, and acres; harvest by treatment method, revenues, ratio of sawtimber to pulpwood, and payments to counties. Several years are included to provide a sense of the trends. This information was compiled from actual sales that were offered and sold during Fiscal Years (FY) 2011, 2012, 2013 and 2014.

Results

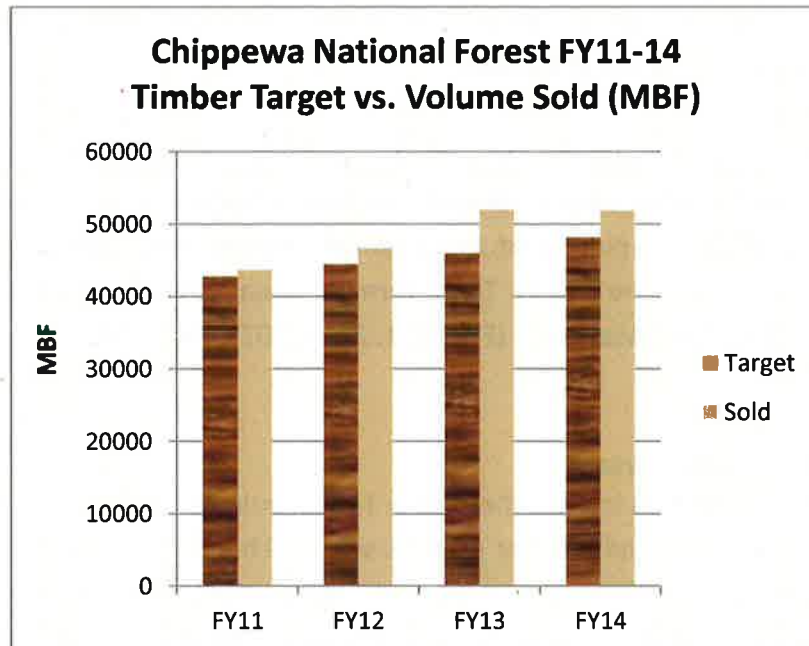
Timber target, volumes, and acres

Types of information monitored include the timber target, volume sold, volume harvested, uncut volume under contract, and number of acres sold and harvested. The volume sold is further broken down into sawtimber and pulpwood. The annual timber target for sell is negotiated each year with the Regional Office. Information provided in Table 2-1 and Table 2-2 is derived from the Annual Bid Monitoring Report (FY 2011-2014) and the Timber Cut and Sold Report (Timber Sale Accounting Program FY 2011-2014).

Table 2 -1. Timber Target, Volume Offered & Sold, Volume Harvested, and Uncut Volume under contract, and acres sold and harvested by FY.

	FY 2011	FY 2012	FY 2013	FY2014
Timber Target (MBF)	42,810	44,500	46,000	48,200
Volume Sold (MBF)	43,706	46,695	51,982	51,884
Volume Harvested (MBF)	34,803	33,756	49,132	48,204
Uncut volume under contract (MMBF)	109.8	122.5	125.4	130.6
Acres Sold	4,980	5,950	6,434	5,847
Acres Harvested	3,943	4,967	5,782	5,717

The timber sell target assigned to the Forest has increased since 2011 going from 42,810 to 48,200 MBF in 2014, a 12.5% increase. Volume sold has steadily increased from 43,706 MBF in FY 2011 to 51,884 MBF in 2014, a 19% increase. From FY11 to FY14, volume sold has been slightly above the assigned target. Acres sold have fluctuated from 4,980 acres in FY 2011 to 5847 acres in FY 2014. As a result of the 2012 wind storm, there was a pulse of salvage and damaged acres sold that resulted in a peak of 6434 acres in FY 2013.



Volume harvested has increased from 34,803 MBF in FY 2011 to 48,204 MBF in FY 2014. The increase in harvest volume can be explained by the improved economic conditions and the 2012 blowdown event on the Chippewa. Local mills including Norbord, Sappi and Potlatch have made significant investments to upgrade and modernize equipment. This has resulted in increased capacity and more demand for stumpage.

Uncut volume under contract increased in FY 2011 from 109,800 MBF to 130,600 MBF in FY14. This increase in uncut volume can be attributed to several factors. One factor is the recent round of market related contract term adjustments in FY 2013 that offered an additional year to many timber contracts. Another factor is the 2012 blowdown event. Many purchasers switched to harvesting salvage sales in an effort to capture the wood products before disease and rot had a significant impact to wood quality. As a result, many of the purchasers have requested additional time on their regular green timber sales due to time lost on salvage sale operations.

The number of acres harvested has increased steadily from 3,943 acres in FY 2011 to 5,717 acres in FY 2014 (Table 2-1). Again, the blowdown event of 2012 has had a significant impact on the number of acres harvested due to salvage timber sales. In addition, the recent rebound of stumpage prices and economic conditions has created incentive for purchasers to harvest timber.

Seasonal weather variations can also affect the amount of timber harvested. Extended cold winters in 2012 and 2013 have had a positive impact on the acres harvested. In addition, the relatively snow-free winter along with extended cold temperatures in 2014 provided excellent conditions for harvest. Many timber sales requiring frozen ground operation have been completed over the past two to three winters.

The increase in acres harvested should continue into FY 2015 as many of the salvage sales will reach termination. Stronger markets and prices will drive more purchasers to continue with harvest plans. Economic forecasters are calling for flat to declining wood production in Canada and dramatic reductions in exports from Russia and China. As the housing market in the U.S. continues to rebound and demand for housing units in China booming at 15 to 17 million units in 2011, the demand and prices for softwood lumber will be strong (Wilent 2014). In Minnesota, the strengthening of the economy, including the housing industry, has allowed several of the primary mills and saw mills to make capital investments during 2012-2013 which will provide for improved efficiencies, expanded product markets and increased production (Minnesota Forest Resources Report 2014).

Harvest by Treatment Method

The Forest utilizes a variety of silvicultural systems to accomplish Forest Plan objectives. For decade 1 (2004-2014), thinning treatments have exceeded the planned acres while clearcutting treatments are below planned acres (Table 2-2). Overall, total acres treated for decade 1 (39,500 acres) are 51% of planned treatment acres (77,139 acres).

Table 2-2. Probable and actual acres of timber harvest by treatment method from Forest Plan Table APP-D2 Administrative Correction 9/14/2007.

Treatment	Probable Decade 1 Acres	Decade 1 Actual Acres Treated	Probable Decade 1 % acres treated	Decade 1 Actual Treated % acres
Thinning	16,000	18,130	21	46
Clearcut	29,866	12,777	39	32
Shelterwood	11,149	4,750	14	12
Uneven-aged	20,124	3,843	26	10
Totals	77,139	39,500	100%	100%

Decade 1 is 2004-2014.

Revenues

Overall revenue for timber offered and sold increased from FY 2011 to FY 2014 with a decrease specific to FY 2013 (Table 2-3). The 8 year average value of timber sold on the Chippewa National Forest is \$2,624,776 (FY 2007-FY 2014). A large volume of timber was offered and sold as salvage with discounted prices due to damage and deterioration of wood quality. In FY 2014, 23% of the total volume sold was sawtimber. This was an increase from previous years. Much of the sawtimber volume in FY 2013 was reclassified and sold as pulp product due to breakage and stain from the blowdown event. The sawtimber percentage should remain steady or slightly increase as all of the salvage volume has been sold from the 2012 blowdown event.

Table 2 -3. Value of stumpage offered and sold by the Forest by FY.

Fiscal Year	Total Value (\$)	Value \$/mbf	Value \$/ccf	Aspen pulpwood \$/mbf	Sawtimber (80%+pine) \$/mbf
FY 2011	3,073,538	70.32	43.24	66.97	111.79
FY 2012	3,204,198	68.62	42.02	73.81	115.90
FY 2013	2,386,483	45.91	28.34	43.98	132.14
FY 2014	3,662,593	70.59	43.10	58.47	159.52

Prior to 2013, there had been a steady increase in sawtimber and pulpwood prices, although there have been variations for specific species. The decrease in aspen prices in FY 2013 can be explained by salvage sales and discounted prices. Sawtimber revenues for conifer species remained steady or increased from FY 2011 to FY 2014 (Table 2-3). Sawtimber prices have increased 43% from FY 2011 to FY 2014. The increase in sawtimber prices is a result of the economic recovery and the increase in demand for softwood dimensional lumber, mainly for construction purposes.

Competition in bidding by purchasers for federal timber has remained strong. In FY 2014, there were 22 different bidders with an average of 3.5 bidders per sale. The Forest attracts some of the largest purchasers operating in the state of Minnesota due to large volume sales and good operating conditions throughout the year.

The Forest is offering a mix of sales, from small sales to larger ones in terms of volume. Due to the mix of state, county, private and federal stumpage available, there does not appear to be a shortage of wood delivered to the mills or to meet the needs of the purchasing public. However, there has been significant investment by several mills recently and the increased efficiency and capacity may result in more pressure for the National Forest to provide additional volume, especially pine sawtimber. In FY 2014, there was a statewide team being convened with state, federal, county, tribal and industry officials to look at additional opportunities in red pine management.

Ratio of Sawtimber to Pulpwood

As illustrated in Table 2-4, the ratio of sawtimber to pulpwood is lower than what was predicted in the Forest Plan. One of the reasons for this is the increased amount of thinning in pine stands and the removal of small diameter material. With the 2007 administrative correction, proposed thinning acres increased from 6,749 acres to 16,000 acres.

Table 2-4. Ratio of sawtimber to pulpwood volume sold.

	Decade 1 (Proposed)	Actual Ratio FY 2011	Actual Ratio FY 2012	Actual Ratio FY 2013	Actual Ratio FY 2014
Sawtimber:Pulpwood	32:68	18:82	19:81	14:86	23:77

Payments to the Counties

The federal government makes payments to states to cover some of the cost of local government services on tax-exempt National Forest System lands. The states pass those payments on to the counties in which National Forests are located. Payments in Lieu of Taxes (PILT) payments are calculated and made by the Department of Interior, Bureau of Land Management. These payments are appropriated annually by Congress based on available funding and formulas that take into account the population in the affected counties, the number of acres of federal land in those counties, and other payments received by the counties based on federal land payments.

The Secure Rural Schools and Community Self- Determination Act (SRS) was enacted in 2000 and since then has been reauthorized several times. In a recent reauthorization, the FS requested states and counties to elect either to receive a share of the 25% rolling average payment or to receive a share of the Secure Rural Schools State (formula) payment. A county electing to receive a share of the State payment that is greater than \$100,000 annually was required to allocate 15-20 percent of its share for one or more of the following purposes: projects under Title II of the Act, Projects under Title III; or return the funds to the Treasury of the United States. Under the Secure Rural Schools Act additional money was made available to be used for projects recommended by local resource advisory committees (RAC) to maintain infrastructure, improve the health of watersheds and ecosystems, protect communities, and strengthen local economies. Payments to Counties for FY 2011, 2012, 2013 and 2014 are displayed below in tables 2-5, 2-6, 2-7 and 2-8.

Table 2-5. Payments to Counties for FY 2011.

FY 2011		Payment in Lieu of Taxes (PILT)	SRS Title I Funds	SRS Title II Funds	Grand Total
County	FS Acres	Total \$	Total \$	Total \$	Total \$
Beltrami	62,145	86,924	95,930	16,928	199,782
Cass	283,135	451,440	345,026	60,887	857,353
Itasca	305,476	444,435	450,396	79,481	974,312
Total	650,756	982,799	891,352	157,296	2,031,447

Table 2-6. Payments to Counties for FY 2012.

FY 2012		Payment in Lieu of Taxes (PILT)	SRS Title I Funds	SRS Title II Funds	Grand Total
County	FS Acres	Total \$	Total \$	Total \$	Total \$
Beltrami	62,145	96,376	92,578	16,337	205,291
Cass	282,975	499,673	297,751	52,544	849,968
Itasca	305,476	497,475	400,033	37,650	935,158
Total	650,596	1,093,524	790,362	106,531	1,990,417

Table 2-7. Payments to Counties for 2013.

FY 2013		Payment in Lieu of Taxes (PILT)	SRS Title I Funds	SRS Title II Funds	Grand Total
County	FS Acres	Total \$	Total \$	Total \$	Total \$
Beltrami	62,145	104,182	90,703	16,006	210,891
Cass	282,971	517,895	283,548	50,038	851,481
Itasca	305,476	522,140	390,717	36,773	949,630
Total	650,592	1,144,217	764,968	102,817	2,012,002

Table 2-8. Payments to Counties for FY 2014.

FY 2014		Payment in Lieu of Taxes (PILT)	SRS Title I Funds	SRS Title II Funds	Grand Total
County	FS Acres	Total \$	Total \$	Total \$	Total \$
Beltrami	62,339	114,443	88,076	15,543	218,062
Cass	287,366	591,996	265,251	46,809	904,056
Itasca	306,437	573,602	389,388	36,648	999,638
Total	656,142	1,280,041	742,715	99,000	2,121,756

Implications

- Volume offered, sold and harvested are within the Forest Plan expectation levels. The Forest is meeting assigned timber targets for volume sold. The Forest Plan allowable sale quantity (ASQ) for decade 1 is 580 million board feet or 58,000 MBF per year (Appendix D Forest Plan). The average volume sold from FY 2011-FY 2014 is 48,567 MBF per year or 84% of the allowable sale quantity (Table 2-1). According to timber industry representatives, the Chippewa is achieving the highest percentage of their ASQ of any Forest in Region 9 (personal communication).
- The Forest Plan estimates that in Decade 1 approximately 77,139 acres will be treated or approximately 7,713 acres/year (Administrative Correction 9 dated 09/14/2007 Table APP-D2). For decade 1, the actual total acres treated by timber harvest are 39,500 acres or 51% of the planned acres of 77,139 (Table 2-2) even though we are cutting 84% of our ASQ. Prior to the next Forest Plan Revision, harvest prescriptions for forest types and expected volumes per acre need validation.
- The ratio of sawtimber to pulpwood is lower than proposed for decade 1 in the Forest Plan (Table 2-4). The 2012 blowdown event has increased the percentage of pulpwood being offered for sale. This is due to the breakage and damage in timber and the products being reduced from sawtimber to pulpwood to attract purchasers of salvage sales in an effort to restore sites. In decade 2, the Forest Plan ratio of sawtimber to

pulpwood is 43:57 (Table TMB-20 Final EIS-3-4 Volume 1 Timber p.3.4-20). This increase in sawtimber percentage will be difficult to achieve based upon current harvesting prescriptions and management direction.

- Revenues generated from timber sales were on the rise from FY 2011 to FY 2012 (Table 2-3). The 2012 blowdown event negatively impacted timber revenues in FY 2013 due to reduced salvage sale prices. Stumpage revenues have rebounded in FY 2014 and are forecasted to continue to increase. It can be expected that revenues from green timber sales will rise as economic conditions continue to improve and demand for public stumpage in Minnesota remains strong.

Other considerations

Retention of Adequate Canopy Cover

The Forest Plan standards and guidelines require 50-70% canopy cover for large patches, goshawk, goblin fern, wetlands in northern hardwood stands, and riparian areas. Although TES (Threatened, Endangered, Sensitive species) locations were considered and included in the modeling for the revision process (FEIS, Appendix B, p. B-4), the number of RFSS (Regional Forester Sensitive Species) locations has increased. It is unclear how much this has impacted harvest treatments and acres or how this compares to the outputs modeled. In addition, wetlands in northern hardwood stands are a common occurrence resulting in stands being dropped during project planning or implementation. Some of these stands were dropped from treatment during the revision modeling process but again it is unknown how planned versus actual numbers compare.

Northern Long Eared Bat

In April 2015, the northern long-eared bat was federally listed as a threatened species under the Endangered Species Act (USFWS News Release April 2015). Along with the listing, an interim 4(d) rule was published.

The interim 4(d) rule exempts take for forest management as long as the following conservation measures are implemented:

- Activity occurs more than .25 miles from a known, occupied hibernacula,
- Activity avoids cutting or destroying known, occupied roost trees during the pup season (June 1-July 31),
- Activity avoids clearcuts (and similar harvest methods, e.g. seed tree, shelterwood and coppice) within .25 mile of known, occupied roost trees during the pup season (June 1-July 31).

The U.S. Fish and Wildlife Service anticipate the final rule will be published in January 2016.

Depending on the conservation measures included in the final rule, season of harvest activity may be restricted which may impact timber sale operations, sale marketability and timber revenues in the future.

Stewardship

The Forest has been actively utilizing stewardship contracting authority in recent years to accomplish a wide variety of restoration work on the Forest. The primary form of stewardship contracting utilized is the integrated resource timber contract (IRTC) which exchanges the value of timber (goods) for service work (services).

The Forest signed a master stewardship agreement with the LLBO in 2014 for future stewardship agreement work. In addition, stewardship agreements are currently being planned with county (Itasca) and state agencies (MNDNR) for restoration work.

The Forest has executed 13 different stewardship contracts on the Forest. The overall value of goods exchanged for services is approximately \$2 million to date. This tool is an effective method for completing high priority restoration work on the ground while returning timber revenues locally to the communities and employing local contractors.

Good Neighbor Authority

In the 2014 Farm Bill, Congress made the Good Neighbor Authority permanent which allows state agencies to work directly on Forest Service lands through an agreement. The Superior and Chippewa National Forests have held recent meetings with MNDNR Forestry to discuss opportunities and form a technical team to expand discussions on utilizing Good Neighbor Authority in Minnesota.

Recommendations

- The Forest is meeting assigned timber targets for volume sold even though acres harvested are below Forest Plan estimates. Validate the types of harvest prescriptions being used by forest type and the expected volumes per acre.
- The frequency of thinning in red pine as well as the timing of thinning at younger ages should be analyzed and considered. On Forest Service lands within the Chippewa, red pine occupies 71,769 acres. This represents over 11% of the total red pine acreage in the state of Minnesota. Of this total, over 27,000 acres of red pine are in the age class 41-80 years, an ideal and critical intermediate treatment opportunity.
- Ratio of sawtimber to pulpwood (23:77) is lower than proposed for decade 1 in the Forest Plan (32:66). Further, the goal for Decade 2 increases this ratio to 43:57. An

increase in sawtimber percentage will be difficult to achieve based upon current harvesting prescriptions and management direction.

- The northern long-eared bat was listed as threatened with the 4(d) interim rule. The final rule is anticipated in January 2016. It is unclear if this listing will place additional restrictions on summer harvest and if that will have an impact on timber sale marketability and stumpage prices.
- The Forest should continue to utilize stewardship contracting and consider Good Neighbor Authority as a tool to accomplish restoration work.

3. Regeneration

National Forest Management Act (NFMA) regulations require that cutover lands be adequately restocked within five years. Stocking surveys on regenerated stands are conducted the first, third and fifth years after harvest to assess stocking levels. Regeneration may occur naturally or by planting or seeding.

Key points

- Adequate restocking of regeneration harvest stands was met on 52.3% of the acres harvested in FY 2009 by the end of FY 2014.

Monitoring Question

Are harvested lands adequately restocked after five years?

Results

Reporting of harvests, reforestation activities, stocking surveys, and certification occurs in FACTS (Forest Activity Tracking System), our corporate database.

In FY 2014, 7,869 acres received reforestation or silvicultural treatments (Table 3.1). Approximately 1.7 million seedlings were planted on 1,598 acres; 17 acres were seeded; and 921 acres were regenerated naturally. Bud capping (animal damage control) was done on 3,544 acres. Approximately 810 acres were released from competitive vegetation.

Table 3-1. Acres of accomplishment in FY 2014 for reforestation activities.

Reforestation Accomplishments	
Activity	Acres
Planting	1,598
Seeding	17
Site Prep for Natural	303
Certification of Natural Regeneration without Site Preparation	618
Site Prep for Planting or Seedling	979
Release	810
Animal Damage Control	3,544

Reforestation Monitoring

Table 3-2. FY 2009 regeneration (regen) harvests by zone.

Zone	FY 2009 Regen Harvest Stands	FY 2009 Regen Harvest Acres	FY 2009 Regen Harvest Acres Certified by FY2013	Summary
Eastside	22	348	273	78.5% NFMA Compliance
Westside	72	1,500	693	46.2% NFMA Compliance
CNF Total	94	1,848	966	52.3% NFMA Compliance

Ninety-four stands (1,848 acres) received treatment by regeneration harvests in FY 2009. Five years after harvest, 52.3% of these acres were fully stocked and certified by the end of FY 2014. The Westside of the Forest had 81% of the harvest acres and NFMA compliance was documented on only 46.2% of the acres. The Eastside of the Forest had 19% of the harvest acres and their NFMA compliance was of 78.5%.

Not being able to achieve 100% NFMA compliance is related to several contributing factors. One of these is that there were several vacancies, employees with limited experience, and lack of staff availability. The 2012 blowdown event created a large reforestation work program, and the staff was too small to accomplish all the work.

To provide some context on the extensive nature of the reforestation program, in February 2015, there were a total of 650 sites forest-wide (13,098 acres) that were in the process of being regenerated. These sites have all had regeneration harvests completed and are currently in some stage of reforestation leading to certification. All of these sites need annual visits to monitor conditions and apply prescribed treatments (i.e. planting, inter-planting, replanting, site prep, animal damage control, survival surveys, stocking surveys, release). Due to the blowdown event, the harvesting and the reforestation program has grown considerably without a commensurate increase in staffing levels.

Table 3-3. NFMA compliance for FY 2010 – 2014.

Certifications Reported for Fiscal Year	NFMA Compliance Five Years after Harvest
2010	99.5%
2011	69.9%
2012	80.7%
2013	86.6%
2014	52.3%

The Forest has worked very hard to meet its goal of 100% NFMA compliance. Despite these efforts, some challenges remain very difficult. With tremendous competition from hazel brush on many sites, coupled with no use of herbicides to control competition, all release must be done by hand cutting. The brush grows back quickly from cutting and is potentially denser than initial conditions. Three treatments of hand release are planned on all sites.

The development of a disc in 2008 (the "Chippewa Harrow") to do site preparation has proven to reduce competition from brush, therefore reducing the number of entries required for hand release. This type of site prep work increased our efficiency and ability to meet NFMA requirements.

The second major challenge comes from deer that browse every species of conifer on the Forest (jack pine, white pine and white cedar are preferred). In the past the Forest sprayed repellants in an attempt to discourage deer from eating seedlings. Over time deer adapted to this strategy and it became ineffective. In recent years, the Forest switched from repellants to bud capping. Bud capping is labor intensive and not 100% effective. It does however appear to be more successful than repellants at this time.

Implications

- Adequate restocking of regeneration harvest stands was met on 52.3% of the acres harvested in FY 2009 by the end of FY 2014. Stands not yet certified continue to be tracked and surveyed, and will be certified as soon as establishment is complete. A listing of these stands is in the project file.
- Due to the blowdown event, there is increased harvesting and the reforestation program has grown without a commensurate increase in staff.

4. Wildlife and Plants

Included in this section is a discussion of Regional Forester Sensitive Species (RFSS), Management Indicator Species (MIS), Threatened and Endangered Species (T&E), Breeding Birds, and Non-native Invasive Species (NNIS).

Key Points

- In 2014, all management activities were completed within 2004 Forest Plan direction for Regional Forester Sensitive Species. Projects that were analyzed either had no impact or were not likely to cause a trend to federal listing or loss of viability on the Chippewa National Forest. In addition, all Forest Plan Standard and Guidelines were successfully implemented on the ground.
- In 2014, the Forest contributed toward the conservation and recovery of both the Canada lynx and gray wolf through habitat and access management practices, collaboration with other federal and state agencies, as well as researchers, tribal bands and non-governmental partners.
- The Forest initiated a partnership with the Superior NF, University of Minnesota and Minnesota DNR to learn more about the status of the Northern Long Eared Bat which was listed as a threatened species in April of 2015.
- The Monitoring and Inventory Survey Team continued to make improvements to the screening process in surveying various RFSS on the Forest. This improved screening process has made the surveys on the Forest more effective in detecting locations of RFSS. The consistent increase of new locations added each year also suggests that our understanding of where and when to search for these species is improving.
- Breeding bird community appears to be in excellent condition with the vast majority of species trends increasing or stable. Some concerns exist for declining population trends for the Connecticut Warbler.
- Hand and mechanical treatments of NNIS appeared to be quite effective. In contrast, biocontrol release sites were not very successful. Continue NNIS treatments and monitoring efforts.

Regional Forester Sensitive Species (RFSS)

Monitoring Question

To what extent is Forest management contributing to the conservation of sensitive species and moving toward short term (10-15 years) and long-term (100 years) objectives for their habitat conditions?

Background

Meeting this objective involves two basic and complementary strategies that would be implemented based on species' habitat requirements and distribution, individual site conditions, expected management impacts, and other multiple use objectives. These strategies include:

- a. Landscape level (or coarse filter) management strategies: Addressing species' needs through integrated resource management at large landscape scales including, but not limited to: Landscape Ecosystem or Landtype scales for vegetation and management indicator habitat objectives; watersheds for aquatic and riparian condition objectives; and Management Areas for desired or acceptable levels of human uses.
- b. Site-level (or fine filter) management strategies: Addressing species' needs by managing specifically for high quality potential habitat or known locations of sensitive species.

Results

Surveys

The Forest surveys for sensitive species every year, primarily in the area of upcoming vegetation management projects. In 2014, the Ranger Districts submitted 5048 acres for RFSS surveys for future vegetation management projects. The Chippewa NF Monitoring and Survey Team (MIST) were responsible for the screening of habitat and completion of surveys for all 60 RFSS on the acres submitted. Survey results are used by the District interdisciplinary teams in the design of vegetation management projects.

In 2014, fewer RFSS plant species were found due to the low quality of stands surveyed and the high level of worm infestation. The most common RFSS species found were the bald eagle, Canada yew, white adders mouth, and ternate grapefern. Forest staff found two new species- *Botrychium tenebrosus* (swamp moonwort) and *Heterodermia obscurata* (obscure shield lichen).

Table 4-1. Summary of RFSS additions to Forest records from 2011-2014.

Category	2011	2012	2013	2014
Bird	43	26	74	78
Plant	346	280	309	147
Mammal	0	1	0	0
Total	389	307	383	225

RFSS Location Monitoring

The Forest also actively monitors known locations of RFSS on an annual basis to determine if changes have occurred at each of the locations. Monitoring results help confirm the effectiveness of the Forest Plan standard and guidelines and further establishes population estimates of those species within the Forest.

Follow-up location monitoring was completed following vegetation treatment. Monitoring results indicate no detectable changes in population trends on any of the RFSS species due to vegetation management. The Forest is planning to continue location monitoring in these areas to further qualify any trends from past management.

In 2014, the Forest completed over 29,613 acres of call point surveys for RFSS bird species. The reduction of acres surveyed was due to the stands submitted for surveys by the District planning teams.

Table 4-2. Total acres surveyed for RFSS from 2011-2014.

Survey	2011	2012	2013	2014
Northern Goshawk	43,375	36,757	38,655	22,778
Red-Shouldered Hawk	9,625	13,628	11,288	5,920
Songbirds	2,628	815	1,428	915
Plants	14,834	15,957	14,130	4,721

Efforts were also made to review and update old data to accurately reflect the locations of RFSS species and changes to the habitat. Additionally, records were removed for a variety of reasons including the record no longer exists (e.g. a tree supporting an eagle nest falls), or the record was faulty (e.g. improperly recorded location; or a duplicate record).

Habitat Risk Assessments

2014 efforts on risk assessments were primarily further updates to plant screening criteria. Emphasis was on describing uncommon forest types regarded as high risk stands for RFSS presence. Habitat trends for *Cyprideium arietinum* were reviewed and screening criteria updated. This improved screening process has made the surveys on the Forest more effective in detecting locations of RFSS. In the past five years there have been approximately 10% fewer acres surveyed due to improvements.

Botrychium Monitoring

In 2014 scientists from Gustavus Adolphus College completed the final analyses of below ground structures of *Botrychium mormo* as part of a challenge cost share agreement between the Forest and the college. The study included a re-survey of five sample plots of differing plant numbers



Bing.com/images

and disturbance regimes initially surveyed in 2002 and then resampled in 2012. The goal of the project was to see if the 2002 populations are re-establishing and to get a better grasp of the ecology of *Botrychium* by understanding the key role below ground structures play for these species. Dr. Cindy Johnson, Ph.D., from Gustavus Adolphus College, directed the project and wrote the final report of the project findings in 2015.

During the summer of 2014, we modified the study to add a second component by conducting a baseline study of a site relatively undisturbed by worms in an area that included *Botrychium ascendens* and *Botrychium crenulatum*. At this site, *Botrychium* moonwort populations and other plant species composition are to be monitored in a series of above ground plots over an extended period to determine trends.

According to Cindy Johnson, the re-survey of the 2002 plots in 2012 revealed that populations have not rebounded. Only one site had a population increase, all other sites declined. Generally, the abundance of below ground structures in 2012 remained about the same as those in 2002. She further said that there was negligible change in below ground structure banks and it seems likely that these populations are nearing extinction. All sites had evidence of worms from data collected in 2012, including the two control sites thought to be worm free. The data from the new baseline study site reveals that below ground analysis found a relatively small number of below ground structures compared to the number of plants above ground. Soils at the site are extremely high in organic matter and calcium. There was evidence of worms in the samples at the baseline study site which may be indicative of a future worm invasion.

Implications

- In 2014, all management activities were completed within the 2004 Forest Plan direction for Regional Forester Sensitive Species. Projects that were analyzed either had no impact or were not likely to cause a trend to federal listing or loss of viability on the Chippewa National Forest. Forest Plan Standards and Guidelines are being implemented for RFSS and appear to be within the scope of the Forest Plan FEIS environmental effects.
- The Monitoring and Inventory Survey Team continued to make improvements to the screening process in surveying various RFSS on the Forest. We are spending less time and dollars surveying yet finding more species.

Management Indicator Species (MIS) and Threatened and Endangered (TES)

Monitoring Questions

What are the population trends of management indicator species and Threatened and Endangered Species?

To what extent is Forest Management contributing to the conservation of threatened, endangered, and sensitive species and moving toward short term (10-15 years) and long-term (100 years) objectives for their habitat conditions?

Background

This resource area monitors and evaluates population trends of designated Management Indicator Species (MIS). Management Indicator Habitats (MIH) are identified for the Forest along with MIS to be used to analyze the potential effects of management practices on wildlife habitats and populations.

MIS are defined as species monitored over time to assess the effects of management activities on their populations and the populations of other species with similar habitat requirements (Forest Service Manual 2620.5, (1991)). The rationale underlying the MIS concept is that by managing for and conserving the habitats in which MIS occur, other species that depend on these habitats would also be provided for.

The Chippewa National Forest has identified four MIS:

- gray wolf,
- bald eagle,
- northern goshawk, and
- white pine.

The gray wolf and bald eagle were designated as MIS under the 1986 Land Management Plan for the Chippewa. As MIS, they have been monitored for the past 20 years. The northern goshawk and white pine are new MIS in the 2004 Forest Plan.

Results

Gray wolf (MIS and TES)

The Minnesota Department of Natural Resources (MN DNR) has monitored its statewide wolf population since the late 1970s. These surveys obtain data on wolf distribution and abundance in Minnesota.

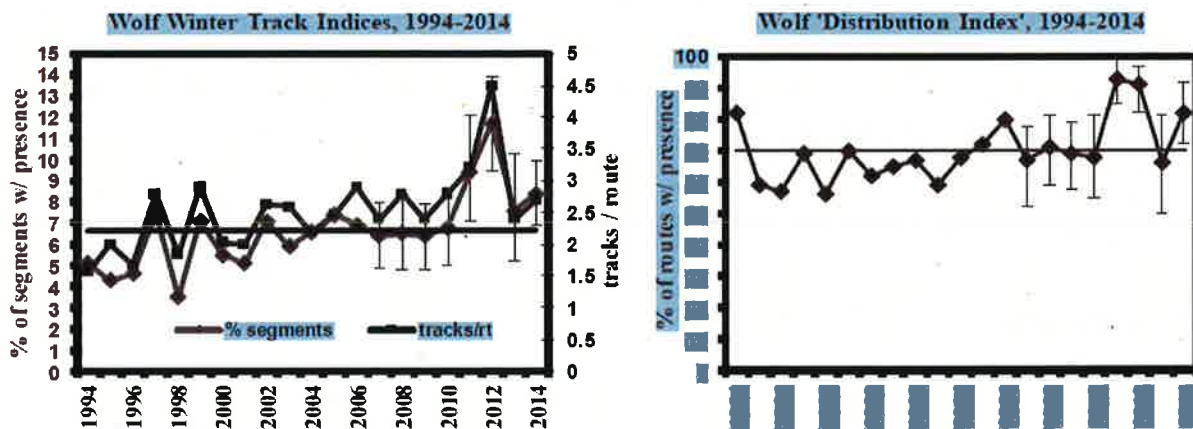


Bing.com/images

Previous surveys occurred at 10-year intervals (1978-79, 1988-89, and 1997-98). However, in anticipation of a federal de-listing proposal in 2004, the survey interval was lowered to 5 years. The most recent survey was completed in the winter of 2014-15. The Forest contributes observation information. Wolf populations in the western Great Lakes have exceeded federal recovery goals for numerous years.

Population estimates from the 2014 winter survey (Erb 2014) indicate that there are about 438 packs in Minnesota. This is 13% fewer packs than during the last survey in the winter 2007-2008. This results in an estimated population of 2,211 wolves statewide.

In 2014, wolf indices were near their long-term average, essentially unchanged from last winter. Wolves were detected on ~ 8% of the route segments and 82% of the survey routes. The average number of wolves detected per route was 2.7. The graphs below display track and distribution indices from 1994-2014. The graphs show there was a slight increase in the track distribution and track indices in 2014 from data collected in 2012 but close to long term averages for both indices. There was a 13% decrease in the number of wolf packs in 2014 from data collected in 2007-2008.



Bald eagle (MIS)

The Forest has been monitoring bald eagle populations within its proclamation boundary for over 30 years. In recent years (2009-2013), monitoring flights have been concentrating on inventorying those nests that have not been checked in recent years as well as monitoring the eagle nests within the blowdown area created by a 2012 windstorm. .



Bing.com/images

Efforts in 2014 resumed a Forest-wide inventory of eagle nests and territories. An emphasis included changes in nest distribution within the 2012 blowdown area. Survey results found a total of 313 extant known eagle nests within the Chippewa NF with 115 nests within the blowdown area. Of the total nests found, 107 nests were active Forest-wide (34 within the blowdown area) with an average of 1.3 chicks per active nest. A total of 51 new nests were found Forest-wide (8 within blowdown area). In addition, 27 previously known nests were verified as non-existent.

In 2013 per request by the LLBO DRM, the Forest made the decision not to update Forest Plan Standard S-WL-3 to the most recent bald eagle nest management guidelines (USFWS 2007), but to continue to follow the Northern States Bald Eagle Recovery Plan (USFWS 1983) as it applies to seasonal buffers around active nests. The Forest is currently working with Alabama A&M University assessing “The Effect of Habitat Disturbances and Protection Buffer Zones on Breeding Bald Eagle (*Haliaeetus leucocephalus*) Populations at the Chippewa National Forest”. This report will help show the effectiveness of the 1983 versus 2007 eagle guidelines in relation to different disturbances during the nesting period. A final report will be completed spring of 2016.

Northern goshawk (MIS)

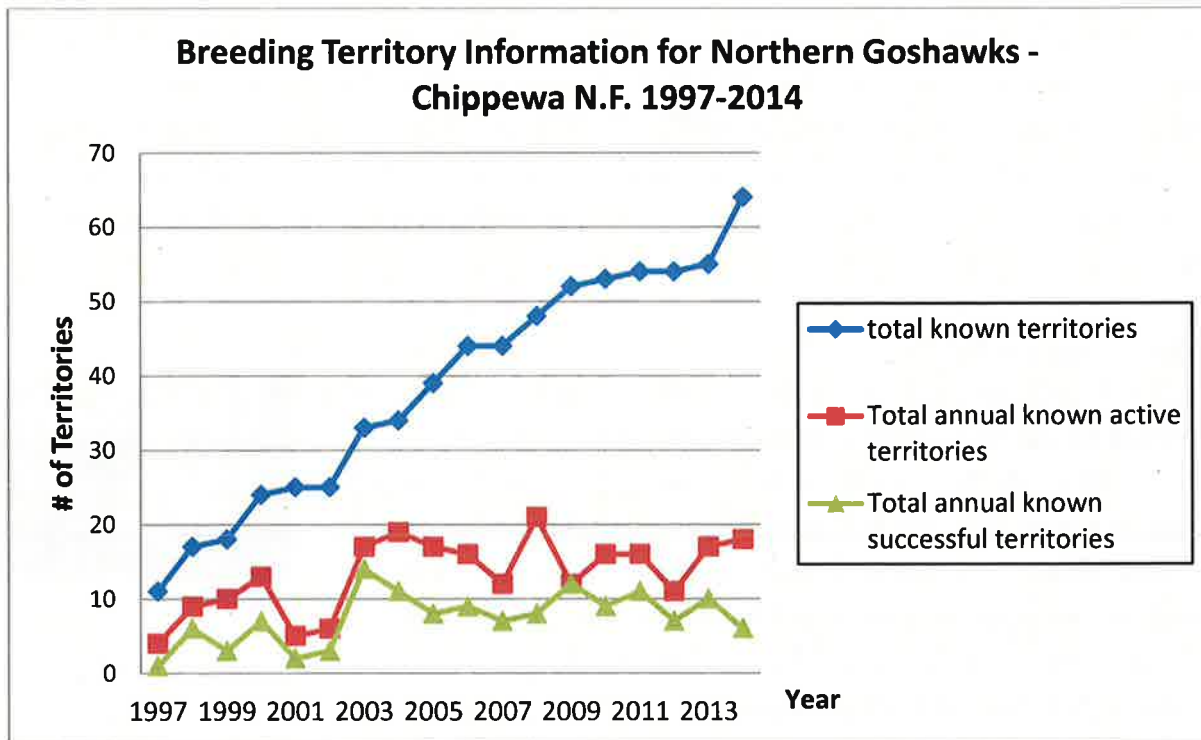
Individual known goshawk nest sites occurring on the Forest have been monitored for about 17 years in order to determine if the nest structure still exists, the nest site is active, and the pair was successful at fledging young. This monitoring has been and continues to be an important aspect in assessing northern goshawk populations and habitat conditions on the Forest, in Minnesota, and in the western Great Lakes region. Three types of surveys are conducted during the monitoring season: occupancy, nesting, and nesting success.



Bing.com/images

These surveys have been conducted by the Forest and MN DNR personnel as well as goshawk researchers from the University of Minnesota. The known goshawk territories on the Forest have been monitored as part of the Northern Goshawk Monitoring Project undertaken by the MN DNR non-game program. This project has been on-going since 2003 and its primary objective is to assess occupancy and productivity of known goshawk territories in northern Minnesota. This productivity data is stored, maintained, and shared with other agencies by MN DNR.

The Forest Plan includes an objective of sustaining 20-30 breeding pairs of northern goshawks. Over the past seventeen years, the cumulative number of known goshawk breeding territories has risen steadily on the Forest, from 11 known in 1997 to 64 known in 2014. This is generally believed to be a product of increased activity in goshawk habitat and a higher interest in monitoring goshawk populations, nesting activities and habitat conditions in northern Minnesota. Monitoring data collected from 2011-2014 indicate that the number of known active territories ranges from 11-19 breeding territories and 6-11 successful breeding territories. Based on the monitoring efforts and results across the Forest, the number of breeding pairs falls below the objective established in the Forest Plan. The graph below provides breeding territory information over the past seventeen years within the CNF boundary based on survey results.



Based on the continued implementation of Forest Plan direction, the number of breeding pairs and suitable habitat conditions are expected to increase over time. Habitat within known nesting and post-fledging zones (PFA) is expected to be maintained per Forest Plan Standards and Guidelines through the current planning period. Uncertainty over consistent guideline implementation, the distribution of habitat outside of PFA's, and forest management on other ownerships pose a risk to this species.

The population dynamics of the goshawk in northern Minnesota are not clearly understood at this time. The data provided is primarily based upon goshawk territories discovered during on-

going field operations on the Forest. Nest counts within goshawk territories are steadily increasing as new nests are found each year. The number of known and historic territories appears to have leveled off since 2009.

Currently, there is no systematic assessment of goshawk population trend or stability on the Forest or in the Western Great Lakes Region. The data compiled for the Western Great Lakes Region was strictly based on habitat with no specific nest or population data. Without trend data it is difficult to determine if goshawk population is increasing, decreasing or is stable. The forest breeding population likely falls within the range of 12 to 39 breeding pairs based on estimated habitat occupancy on the Chippewa (Bruggeman et al 2009) and known territory size (Boal et al 2010). Nest activity, success, and productivity are variable by year.



Canada Lynx (TES)

In 2000, the U.S. Fish and Wildlife Service designated the Canada lynx as a “Threatened” species in the lower 48 states. The Forest continues to contribute towards the conservation and recovery of the Canada lynx through habitat and access management practices, collaboration with other federal and state agencies, as well as researchers, tribal bands and non-

governmental partners.

Monitoring for Canada lynx involves a variety of methods which include field data collection by Forest personnel, collaboration with other federal agencies, MN state natural resource departments, researchers, and contributions from private individuals. The MN DNR is responsible for keeping track of Minnesota lynx sightings in and around the Chippewa NF. Lynx sightings are based on field observations and information from the National Forests snow-trailing, incidental take, or other observations.

White Pine (MIS)

The objective for white pine is to increase the amount of white pine to be more representative of native plant communities. This can be accomplished by planting or naturally regenerating white pine in white pine forest types and in other upland deciduous, mixed, and conifer forest types.

To assess the results of white pine occurrence and management, common stand exam plots were used. There are currently 62,016 plots in FSVeg



(corporate database) distributed across the Forest in every forest type. For the purposes of this analysis, plots are divided into two strata. One strata represents stands that are generally mature and not in a regeneration state (non-regeneration plots). The other strata represent regeneration harvests (regeneration plots) with an objective of establishing regeneration. Regeneration plots occur in clearcuts, shelterwood cuts with reserves, and selection harvests. Regeneration methods include planting of seedlings, artificial seeding and natural seeding. Overstory trees are present on some of the regeneration plots depending on the type of harvest and location of the plot. White pine is often a reserve species in harvests and provides a source of natural seed. Frequency of white pine in each stratum was calculated and is presented in Table 4-3.

Table 4-3. Frequency of white pine (WP) on regeneration and non-regeneration plots .

	Total Plots	Plots with WP	Frequency
Regeneration Plots	7,736	1,851	24%
Non-regeneration Plots	54,280	6,012	11%

According to these data which occurs on NFS lands, the Forest is regenerating white pine at a frequency more than twice that which is found on the landscape in general (stands without recent management activities). This is due to the Forest's efforts to plant, seed, and tend white pine seedlings. White pine requires animal damage control and release from competition to successfully become established. Table 4-4 displays the number of white pine seedlings planted each year starting with 2004 when the current Forest Plan was implemented.

Table 4-4. White pine planted or sown.

Year	Planted	Seed Sown
2004	218,500	
2005	194,000	
2006	221,350	
2007	168,200	
2008	137,000	
2009	214,810	
2010	289,000	
2011	166,000	51.22 pounds
2012	150,000	50.9 pounds
2013	319,000	6 pounds
2014	473,500	
Total	2,551,360	108.12

The Forest has made a concerted effort to increase the amount of white pine on the landscape.

Implications

- In 2014, the Forest contributed toward the conservation and recovery of both the Canada lynx and gray wolf through habitat and access management practices, collaboration with other federal and state agencies, as well as researchers, tribal bands and non-governmental partners.

Recommendations for RFSS, MIS and TES species

- Continue to gather site specific data on all RFSS and TES species at the pre and post projects levels.
- Monitor the effect of management on RFSS species.
- Support inventory and monitoring efforts to better define northern long-eared bat summer habitat in Minnesota. The northern long-eared bat was listed as a threatened species in April 2015.
- Continue efforts to establish white pine, especially in regenerated stands.

Breeding Birds

Monitoring Question

To what extent is Forest management providing ecological conditions to maintain viable populations of native and desired non-native species?

Bird Monitoring

In 1991, the Forest along with the Superior NF initiated a forest bird monitoring program designed to detect trends for a substantial number of birds that nest within the respective forests. The impetus for the program was due to the concern for many forest birds, especially many Neotropical migrants, as well as the mandate to monitor management indicator species within the NF system (Manley 1993). The breeding bird communities of the western Great Lakes region are among the most diverse breeding bird communities in North America (Green 1995, Howe et al. 1997, Rich et al. 2004). The importance of this diversity and concerns with potential declines of some species has led to monitoring forest bird populations in the region. The relatively heavily forested landscapes of northern Minnesota and Wisconsin are considered to be population 'sources' for many forest bird species and may be supplementing population 'sinks' in the agricultural landscapes of the lower Midwest (Robinson et al. 1995, Temple and Flaspohler 1998). Analysis of population trends is used as an 'early-warning system' of potential problems in a species population and serves as a measure of the ecological condition of the environment (Niemi and McDonald 2004). The sampling design and methods are in the project file.

Results

In June and early July of 2014, 135 forest stands we sampled on the Forest. Breeding bird trends over the period 1995-2014 were calculated for 64 bird species in the Forest with 17 species showing an increase in population and seven species a decrease. The remaining 40 species have been relatively stable over the 20-year period. Therefore, approximately 89% of the 64 species that we can detect a statistically significant trend have either increased or remained stable. Overall, this is good news for the status of the breeding birds in the Forest.

Of the seven species that have declined, the Connecticut Warbler has shown a consistent decline of 8% per year. The Connecticut Warbler is primarily found in black-spruce and tamarack forested wetlands. This forest type has not changed substantially over the past 20 years. Factors suspected of contributing to the decline include potential susceptibility to collisions with towers and buildings during migration, habitat and landscape changes in other parts of its breeding range to the north of the Forest, unknown effects on its wintering grounds in northern South America, and changes in climate. The other species that have declined have not been as consistent nor as severe as the trends for the Connecticut Warbler.

The cold and wet spring of 2013 likely contributed to poor nesting success for many forest birds. This is a potential explanation for our observed large decrease in the total number of breeding birds counted in 2014 in the Forest compared with several previous years. We expect this trend to continue in 2015 because 2014 was also a cold, wet, and late spring. This was followed by cool weather and heavy rain events in June 2014. Explanations for the annual trends of bird species will improve each year of the program and a 20 plus year record will allow for a more formal and more rigorous statistical analysis.

Implications

- Overall the breeding bird community of the Forest appears to be in excellent condition with the vast majority of species trends increasing or stable. Some concerns exist for declining population trends for the Connecticut Warbler. If these trends continue, it may be prudent to examine habitat and landscape use and changes within the Chippewa NF in more detail.

Recommendations

- Continue to make the NRRRI bird monitoring surveys across the Forest a priority. This long term study is vital in determining changes to biological diversity due to forest management and climate change.

Non-native Invasive Species (NNIS)

Monitoring Question

To what extent is Forest management contributing or responding to population of terrestrial or aquatic non-native species that threatened native ecosystems?

Results

In 2014, the Forest accomplished 273.8 acres of NNIS plant control, which is 103% of the assigned Regional target for the Forest. The Forest conducted about 138.6 acres of biocontrol on roadside spotted knapweed (*Centaurea stoebe* spp. *micranthos*) infestations by releasing seedhead weevils on selected sites across the Forest. Other work for the remaining NNIS treatments involved hand pulling of garlic mustard (*Alliaria petiolata*) multiple times in the Stoney Point Campground area.

National protocols require each Forest to conduct treatment efficacy monitoring on at least 50% of the total acreage. The Forest monitored approximately 80% of the NNIS treatments. The estimated control of garlic mustard was considered primarily good (76-90%) at 7 infestation sites, and determined as excellent control (91-99%) at the other 2 infestations. Monitoring of the biocontrol release sites were all considered as poor control (6-25%).

As part of a new partnership agreement with the Leech Lake Band of Ojibwe (LLBO) - Division of Resource Management (DRM), other control work was completed for various NNIS plants across the Forest. This work resulted in controlling approximately 206 additional acres of invasive plants on both the Forest and adjacent tribal lands. The majority of the work was control of garlic mustard (*Alliaria petiolata*) (67.5 acres) in the Stony Point and the Onigum peninsula areas. Other priority work involved control of wild parsnip (*Pastinaca sativa*) (57.5 acres) of which some sites included common tansy (*Tanacetum vulgare*), and common buckthorn (*Rhamnus cathartica*) (40 acres) control in scattered locations in the Shingobee area south of Walker and the White Oak area near Deer River. Additional invasive plant treatments involved control of scattered infestations of spotted knapweed (*Centaurea stoebe* spp. *micranthos*), purple loosestrife (*Lythrum salicaria*), Siberian peashrub (*Caragana aborescens*), and leafy spurge (*Euphorbia esula*). The LLBO-DRM "weed crew", also conducted inventories of newfound infestations, confirmed locations of older documented infestations, monitored prior treatment activities, and conducted prevention conservation activities by informing the public about NNIS plants and treatment control through interaction while working near local schools, churches, and campgrounds.

In 2014, 35 new NNIS infestations were located across the Forest. These new found infestations included Chippewa medium/high risk NNIS such as Siberian peashrub and purple loosestrife. Medium risk species located were orange hawkweed (*Hieracium aurantiacum*), meadow hawkweed (*Hieracium caespitosum*) and spotted knapweed. Low risk species included common tansy. Plant surveyors covered about 2,184 acres in 2014, which included inventories for NNIS plants.

The Chippewa continued with the Itasca Water Legacy Partnership for control of purple loosestrife in 2014. Workers released *Galerucella* beetles at 8 sites along shoreline infestations of lakes and rivers on the Forest. These release sites areas are additions to established colonies of beetles at Turtle Lake (3 sites), Bowstring Lake (2), Blind Lake (1), and new release sites on Little Turtle Lake (1), and the Bowstring River (1). Monitoring at Blind Lake in 2014 showed that loosestrife populations are not changing much, so workers continued to release beetles. Loosestrife populations are decreasing dramatically in various locales on Bowstring Lake, but monitoring revealed that other areas continue to contain loosestrife. Monitoring at Cutfoot Sioux Lake in 2014 indicated that loosestrife occurs only in a small infestation in ATV tracks next to the lake, and the rest of the lake is free of loosestrife.

Implications

- Hand and mechanical treatments of NNIS appeared to be quite effective. In contrast, biocontrol release sites do not appear to have much effect at this time.

Recommendations

- Continue efforts to conduct invasive control on NNIS that represent a high ecological risk to natural communities.
 - Garlic mustard treatment in the Stoney Point Campground area is an emphasis.
 - Continue and expand work to control common buckthorn infestations. Focal areas for these treatments would occur in the White Oak, Shingobee, and Pomroy area infestations'. In 2014, the Forest conducted cut stump/herbicide treatment on buckthorn in the Pomroy area, and future work would include follow-up treatments, as well possible expansion to other areas where feasible.
- Continue efforts to control medium/high risk species such as purple loosestrife and Siberian peashrub. Future control of these infestations may include applying herbicides where allowable and feasible. The Forest will continue to release weevils for biocontrol of spotted knapweed at all prior release sites.
- Continue NNIS work with and through our partnerships.
 - The LLBO-DRM crew will continue to perform most of the NNIS surveys, treatment work, and monitoring on the Forest.

- Collaborate with the Itasca Water Legacy Partnership (IWLP) for control of purple loosestrife.
- Other partnerships for NNIS control are with the Itasca County Cooperative Invasive Management Area, and the Natural Resources Conservation Service as part of Upper Mississippi Headwaters Restoration Project. Both of these partnerships include a broad consortium of state, local, and governmental agencies. Other NNIS coordination has included collaboration with the Minnesota Department of Transportation and Beltrami County Noxious Weed Program.
- Continue to monitor at least 50% of the NNIS acreage treated annually using the LLBO-DRM crew and the Forest's MIST crew.

5. Insects and Disease

Key Points

- Tamarack is being damaged by eastern larch beetle and larch casebearer. Both insects are on the increase in recent years but have caused damage since 2004. A review of the tamarack resource for possible management actions is recommended.
- Emerald ash borer (EAB) was discovered in Superior, Wisconsin in 2013. It is just a matter of time before a population is discovered on the Forest. The Forest is being proactive through coordinated partnerships and research projects in hopes of building ecosystem resilience and slowing the spread of EAB once it arrives.

Monitoring Question

Are insects and diseases populations compatible with objectives for restoring or maintaining healthy forest conditions?

Results

Since the early 1950's, aerial surveys have been a valuable tool for monitoring the status of forest insects and pathogens across the 16 million acres for forest land in Minnesota. For the past fourteen years, these surveys have been accomplished through the partnership of the Minnesota DNR Forest Health and Resource Assessment Unit and USFS, State and Private Forestry.

Drought is monitored using the State Climatology, University of Minnesota, website as well as the U.S. Drought Monitor website

<http://drought.unl.edu/MonitoringTools/USDroughtMonitor.aspx>.

The Chippewa National Forest's forest health survey results are displayed in Tables 5-1, 5-2, and 5-3 with summaries following.

Table 5-1 shows the agents causing the most damage in 2014. Figures are included since 2004 to show the trends. There were "0" acres of aspen defoliation, jack pine budworm, porcupine damage, abiotic damage, large aspen tortrix, or Dutch elm disease noted.

Table 5-1. Forest damage (newly affected acres) acres by agent for all ownerships within the Forest boundary.

AGENT NAME	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004
Forest tent caterpillar	34,064	207,001	39,053	2,382	399	0	0	0	0	0	0
Unknown	48	137	67	520	10	8	1,148	1,685	509	198	3,998
Spruce Budworm	263	0	2	339	73	0	0	837	0	0	155
Larch casebearer	1,314	512	667	749	2,787	1,387	785	378	255	351	83
Eastern larch beetle	1,109	447	39	266	12	136	416	142	250	0	0
Ash decline	0	519	0	0	593	0	179	102	0	0	0
Flooding/ Beaver	0	278	301	147	11	64	30	47	148	258	22
Bark beetles	82	2	1	2	30	92	0	0	4	0	0
Rx Fire & Wildfire	507	0	0	91	117	54	79	0	0	0	0
Wind Damage	0	0	4,603	0	0	0	1	0	0	0	0
Decline	823	942	1,702	351	0	883	0	0	0	0	0

Table 5-2. Damage by Forest Type (newly affected acres) by severity rating for all ownerships within the Forest boundary.

HOST FOREST TYPE	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004
Aspen	274	942	1,641	646	0	769	129	5,107	0	912	656
Balsam Fir	263	0	0	13	9	0	346	626	42	0	155
Black Ash	550	519	154	225	593	149	179	102	0	0	366
Hardwoods	34,064	207,012	39,785	2,382	399	32	640	1,469	411	75	1,736
Jack Pine	0	1	0	1	14	35	143	243	2,322	1,346	274
Red Pine	510	2	317	91	125	110	10	0	13	24	16
Softwoods	2	249	521	134	12	32	30	242	141	0	3
Tamarack	2,423	959	706	1,015	2,805	1,522	1,200	519	560	733	696
White pine	0	0	50	0	0	8	0	0	0	0	0
White Spruce	126	149	7	339	76	1	1	0	0	0	0
Both Hdws & Softwoods	0	5	3,254	-	-	-	-	-	-	-	-
TOTAL	38,212	209,838	46,435	4,847	4,045	2,667	2,680	8,519	3,489	3,432	4,546

There was "0" damage to birch, black spruce, elm, oaks, unknown forest types.

Table 5-3. Forest damage by severity rating (newly affected acres) for all ownerships within the Forest boundary.

SEVERITY	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004
Trace	20,250	187,155	23,383	937	1,862	171	663	2,152	673	257	2,339
(5% - 25% affected)	53%	89%	50%	19%	46%	6%	25%	25%	19%	7%	51%
Light	630	1,529	1,313	673	1,095	95	1,299	6,328	541	3,133	1,994
(26% - 50% affected)	2%	3%	3%	14%	27%	4%	48%	74%	16%	91%	44%
Moderate	17,307	20,990	16,419	1,893	383	1,382	511	39	2,246	12	46
(51% - 75% affected)	45%	10%	35%	39%	9%	52%	19%	0%	64%	0%	1%
Heavy	25	164	5,320	1,344	705	1,019	207	0	29	30	167
(>75% affected)	0%	0%	11%	28%	17%	38%	8%	0%	1%	1%	4%
TOTAL	38,212	209,838	46,435	4,847	4,045	2,667	2,680	8,519	3,489	3,432	4,546
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Summaries

The following brief discussions highlight the greatest areas of concern.



Tamarack: On the Chippewa NFS lands, there are approximately 16,300 acres of tamarack cover type. Tamarack occurs as a component in lowland, as well as upland cover types. Tamarack damage/mortality has been on the rise since monitoring began under the 2004 Forest Plan. The majority of this damage has been from two insects: larch casebearer and eastern larch beetle.

The non-native larch casebearer is a defoliator that stresses tamarack by reducing its ability to photosynthesize. Repeated defoliation can weaken and may eventually kill a tree through secondary attacks.

Eastern larch beetle is a native bark beetle. Larch beetles overwinter under the bark as larvae, pupae and adults in tamarack trees. Adult beetles emerge from the trees in the spring, seek out and bore into suitable live trees (those already under attack by casebearers are good candidates) or fresh logging slash. There they construct galleries and lay eggs. Larvae hatch from the eggs, feed in the inner bark and eventually pupate and change into adults. Larva feeding in the inner bark girdle and kill the trees. Even healthy tamarack can be attacked and killed by this beetle. Since 1970, extensive outbreaks have been recorded throughout North America. Only species of larch are attacked by the larch beetle. Forest-wide review of the condition of tamarack stands is recommended.

In 2014 the acres damaged by these two insects was up 253% on the CNF from 2013. Damage and mortality increased from 959 acres in 2013; 2,423 acres in 2014.



Bing.com/images

Forest tent caterpillar: (FTC), *Malacosoma disstria*, incidence went from “0” acres in 2009 to approximately 207,000 acres in 2013. It was expected at the end of 2013 that populations would continue to expand in 2014 – 2015, based on historic outbreaks. Outbreaks occur at intervals of 10 to 16 years and run for 3 to 5 years. The last major outbreak was in 2001. Sampling in July, 2013, in NE Minnesota revealed that cocoons were highly parasitized by a native parasitic fly that kills pupae (up to 90% in some samples). In 2014, populations of FTC took a downturn on the CNF, dropping from 201,000 acres in 2013 to 34,064 acres in 2014. Statewide acres of defoliation dropped from 1.1 million in 2013 to 156,000 in 2014.

Emerald ash borer (EAB): EAB, *Agrilus planipennis* Fairmaire, is an exotic beetle that was discovered in southeastern Michigan near Detroit in the summer of 2002.

On May 13, 2009, an EAB population was found in St. Paul, Minnesota. In August, 2013, EAB was discovered in the city of Superior, Wisconsin. This is the nearest established population to the



Bing.com/images

Chippewa National Forest discovered to date. The area surrounding Superior, WI (Douglas County) was immediately quarantined. Quarantined counties in Minnesota are currently Anoka, Dakota, Fillmore, Hennepin, Olmsted, Ramsey and Winona.

It is expected that this pest will reach the Forest at some point in the near future. When it does the Forest’s ash resource may suffer severe impacts.

At this time, there is no known resistance of native ash to EAB. The Forest is acting proactively through coordinated partnerships, diversification of ash wetlands, and research projects to be able to respond. Building resilience in its ash resource before infestation and slowing the spread of EAB once it arrives are the two primary objectives concerning emerald ash borer.

Gypsy moth (GM): Most gypsy moths trapped in Minnesota have been collected in northeastern Minnesota’s St. Louis, Lake and Cook Counties (the Superior National Forest). The GM front has been moving west from Wisconsin and the Forest was starting to feel the pressure in 2010. However, as of the end of 2014, no known populations of GM have been established on or near the Chippewa NF.



Bing.com/images

Trapping on the Forest has been conducted by both the Minnesota Department of Agriculture

(MDA) and the USDA Animal and Plant Health Inspection Service (APHIS). MDA sets traps on a grid system that rotates through the State. If a moth is trapped one year the location where it was caught will be delimited trapped the following year to learn whether a population has been established, or if a male moth was just carried in by the wind. APHIS works on the Forest as well, through the Leech Lake Band of Ojibwe (LLBO), using the DRM to set and remove traps. Over the past few years individual moths have been caught, usually as single catches in traps. Delimited trapping generally yields no moths the second year, but there are a couple of cases where a moth was caught the second year without a population actually becoming established.

In 2014 the Forest was within the MDA trapping grid and one moth was caught (yellow dot on the 2014 map, Figure 1). Note the reduced catch state-wide from 2013 to 2014. Over 71,000 moths were caught in 2013, statewide, while only 523 moths were caught in 2014. This was likely due to the very cold winter of 2013-2014, and a resulting GM “die-off”.

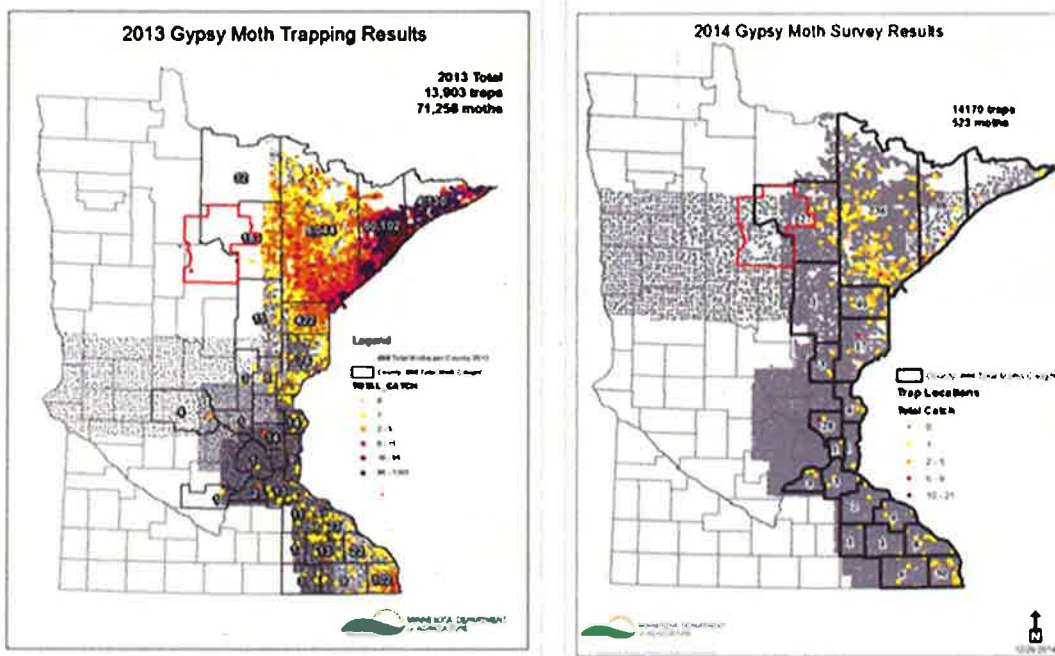


Figure 1. Gypsy moth trapping results.

Fire damage: Fire damage was observed on the CNF on 507 acres in the 2014 aerial survey. This was all in red pine that was prescribed burned on Forest Service lands both north and west of Six Mile Lake. The severity ranged from “trace” to “moderate” resulting in crown scorch and mortality.

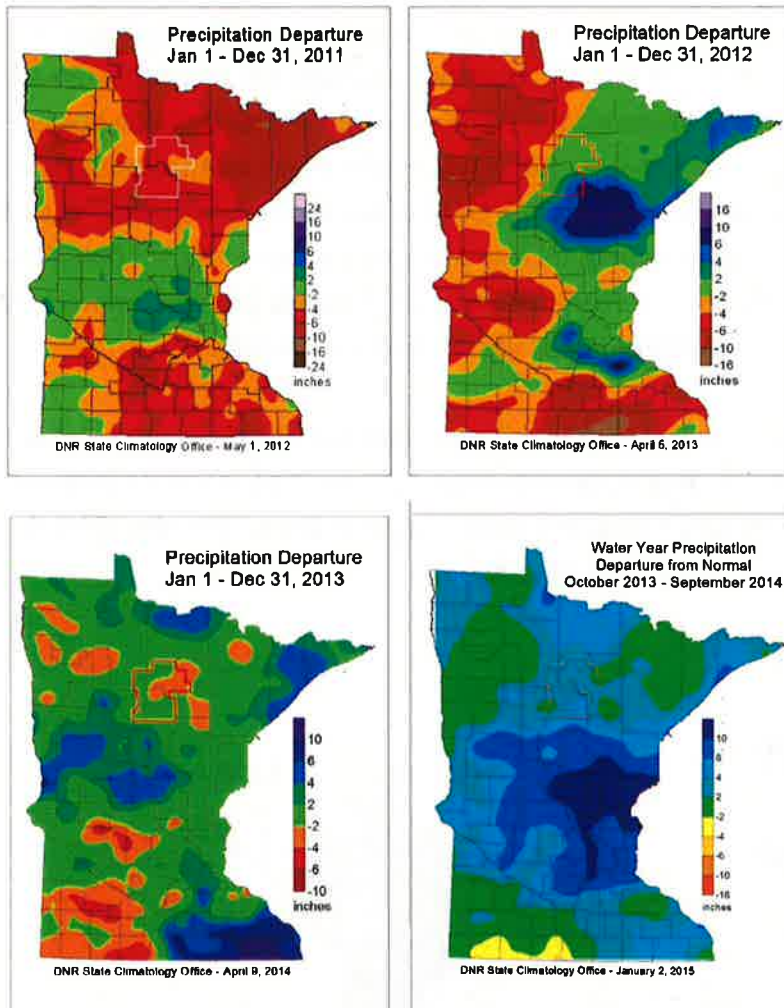


Figure 2: State of Minnesota precipitation departure maps for 2011-2014 showing the Chippewa NF boundary.

Drought:

Many agents affecting forest health are opportunistic. Trees stressed by drought are more vulnerable to these agents. Conversely, adequate or abundant precipitation can provide the resources needed by a tree to fight, or recover from, insect attack. In 2011, the Forest was on the tail end of a drought. Conditions improved in 2012 and in 2013 with precipitation being normal to slightly below the historical normal. In 2014, precipitation continued to improve and was at normal, to slightly above normal at the end of September. Note the DNR changed the reporting period in 2014 (Figure 2).

(http://climate.umn.edu/doc/annual_pre_maps.htm).

Forest Health Workshops: Each year the Forest hosts and coordinates a forest health workshop. Over 90 attended from the Forest Service, MNDNR, industry, counties, LLBO, University of Minnesota and private forestry consultants. Forest health specialists from USDA State & Private Forestry, the MNDNR, MN Dept. of Agriculture, and the University of Minnesota made up the cadre. Subjects presented included updates on MN forest insect and disease problems, gypsy moth trapping results and new quarantines, tamarack mortality, invasive species, suitability of Lake States forests for mountain pine beetles, and emerald ash borer.

Recommendations

- Health issues in tamarack are especially concerning at this time. A forest-wide look at the tamarack stands is recommended to determine the appropriate silvicultural treatments.

6. OHV

Key points

- Public education and information is critical to successfully manage OHV use within the Forest and reduce illegal use.
- Through collaboration with the counties and MnDNR, ongoing analysis is completed that identifies additional OHV riding opportunities and also identifies areas to be closed to OHVs.
- There continues to be a workload associated with identifying roads to be opened or closed to OHV use and roads to be decommissioned.

Monitoring Question

To what extent is the Forest providing OHV opportunities, what are the effects of OHVs on the physical and social environment; and how effective are forest management practices in managing OHV use?

Background

Monitoring information is used to implement the Forest Plan (2004) and the National Travel Management Rule (2006). The Travel Management Final Rule provides expectations for OHV travel access management on the National Forests. The intent of the Rule is to provide regulation of OHVs as a result of the tremendous increases in the number and power of OHVs; and the widespread environmental and social impacts from unmanaged recreation while recognizing that motorized recreation is a legitimate use of National Forest system lands in the right places. The 2007 decision on *Off-Highway Vehicle Road Travel Access* resulted in access rules and policy for roads on the Chippewa National Forest.



The 2004 Chippewa Forest Plan (Volume I, Section 3.8.3), identified the following indicators to be used in measuring the OHV resources.

- New Motorized Trails for Summer Use
- System Roads Open for OHV Use
- OHV and Snowmobile Cross-Country Travel Opportunities
- Consistency Among Public Land Agencies

Monitoring also occurs through public contacts, law enforcement, and the development of Motor Vehicle Use Map (MVUM). These results are summarized below.

Results

The Forest continues to monitor potential change in the management of OHV in the context of the Forest Plan over time. The following table displays the indicators for the last five years.

Table 6-1. OHV Indicators 2010-2014.

Indicator	2010	2011	2012	2013	2014
New Motorized Trails for Summer Use (Miles)	0.0	0.0	0.0	0.0	0.0
System Roads Open for OHV Use (Miles)	1,345	1431	1431	1431	1431
OHV and Snowmobile Cross-Country Travel Opportunities	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
Consistency Among Public Land Agencies	No	No	No	No	No

New motorized trails

There have been no new motorized trails designated for summer use. The Soo Line Motorized Trail is currently the only designated OHV trail on the Chippewa National Forest. It is approximately 20 miles in length and designated for OHV use during the summer and for snowmobiling in the winter. Blackduck District has identified approximately 1.5 miles of OHV designated trail through NEPA analysis and decision. Resources have not yet been allocated for construction and maintenance of this new trail.

A local OHV club and Cass County have been working for a few years to create a MnDNR Grant-In-Aid trail on the Walker District between the communities of Hackensack, Whipholt, and Longville. Approximately 10 miles of trails is proposed to be added to the Forest system. Upon receipt of an application, the Forest will review the information, conduct the appropriate analysis, and make a decision.

Forest Service System Roads for OHV Use

Decisions made by District Ranger's based on analysis in environmental assessments and minor editorial correction to the Motor Vehicle Use Map are the main drivers for change in the quantity of roads open to OHV use. Since 2011, there are 1,431 miles of Forest Service System Roads available to OHV riding in the Chippewa NF.

Over the past two years the Forest has installed signs on designated OHV roads that include a forest road number, OHV placard, and mileage of the road. These signs correspond to the MVUM and aid the rider in knowing where they can legally ride. Periodic sign maintenance is needed to

replace vandalized signs, implement changes to the road system based on decisions made MVUM updates.

Itasca County and the Forest are working together to designate existing Forest Service roads as OHV trails. The County has submitted a plan and request to the Deer River District Ranger Office. The approximate amount of OHV trail proposed is 10 miles.

Road closures and decommissioning continue to be implemented based on decisions resulting from environmental assessments. Road closures can include gates, rock, and berms (earth and debris). Based in incidental observations, these closure devices can be effective. The exceptions are areas with destinations behind the closure such as a desirable fishing lake. In these situations, OHV users simply travel through the brush and around the closure. Road decommissioning is more effective than closures, as culverts and other road improvements are removed, and typically the first "seen" portion of the road is obliterated or scarified. This action greatly improves the success of deterring illegal use.

OHV and Snowmobile Cross-country Travel Opportunities

Cross-country travel remains prohibited. Illegal cross-country use continues to be a significant resource problem that seems to be growing. This use is often associated with illegal permanent hunting stands or recreation riding (getting from point A to B). Forest staff continue to identify illegal cross-country use and close or decommission these areas as resources become available to perform the work.

Consistency among Public Land Agencies

The State of Minnesota, Beltrami, Cass and Itasca Counties have differing policies regarding OHV use. There is no consistency between the county, state and federal governments for OHV use which tends to create confusion for the user.

Motor Vehicle Use Map (MVUM)

The CNF Motor Vehicle Use Map (MVUM) identifies roads and trails designated for motor vehicle use, including OHVs. The MVUM is the legal reference and indicates the routes that OHVs may legally drive. The first edition of the MVUM was distributed in 2009 with over 6,500 maps given to forest visitors. In 2014, the Forest distributed all 2,000 maps on hand. Public comments combined with Forest staff review of the existing OHV and other motor vehicle use opportunities have resulted in proposals to change motor vehicle access on some roads. In 2010 these proposals resulted in an increase of miles open to OHV use from 1,345 to 1,431 miles.

The MVUM maps are available free to the public at CNF offices and also are available at <http://www.fs.usda.gov/recmain/chippewa/recreation>.

Monitoring through Public Contacts

Informing the public about OHV policy and more specifically about which system roads are designated open is the focal point of OHV education. Users continue to inquire about which roads are open for OHV travel. The majority of these contacts occur throughout the summer but peak during the hunting season. To augment the higher level of interest, district staff make hunter contacts during the hunting season. Having information at forest offices, on the web, and knowledgeable staff is critical to educating the OHV public.

Monitoring through Law Enforcement

There are two law enforcement officers and 15 forest protection officers on the Forest. Enforcement of forest orders and other appropriate 36 CFR regulations occurs as needed on the Forest. For many years there has been a Cooperative Law Enforcement (CLE) agreement with Cass, Beltrami and Itasca Counties that provides for a county deputy to work a certain number of days per year that are concentrated on National Forest land. However, the CLE was primarily set up for cooperating deputy sheriffs to patrol in the fee campgrounds after hours, not to enforce OHV regulations. Over the past few years, the CLE program funding has been declining and has not been adequate in offering consistent support to FS law enforcement efforts for OHV regulation.

Law enforcement personnel (including Forest Service, State, Counties, Local and Tribal officers) monitor and respond to activities and behavior on the National Forest and adjoining lands. The primary intent of law enforcement contacts continues to be education with an emphasis on issuing violation notices for illegal riding. The following table shows criminal OHV offenses by year as recorded in the Law Enforcement Annual Report (LEIMARS records).

Table 15. Summary of Law Enforcement Reports Related to OHVs 2010-2014.

Incident	2010	2011	2012	2013	2014
OHV	50	17	41	34	44

OHV offenses may be included in 1) occupancy and use offenses, and 2) travel management restrictions on and off road offense categories. The trend from 2010 to 2014 shows a steady occurrence of OHV incidents. Fluctuations reflect a change in priorities of the law enforcement officers and a change in the numbers of forest protection officers. Qualitative information from Forest Service employees indicates no decrease in the illegal use of OHVs on the Forest.

The Law Enforcement Agenda and Action Plan for FY 2014 includes continuing to assist Forest managers with the implementation of the travel management decisions through public education, review and revision of Forest Supervisor's orders, design and placement of road closures and postings. The Patrol Captain coordinates with the CNF to ensure OHV rules are incorporated into widely dispersed documents such as the various hunting regulation booklets. The Law Enforcement Officers also assists Districts with the inventory and monitoring of unauthorized roads and trails.

Recommendations

The following emphasis areas should be incorporated into future work planning for implementation:

- Educate users on the Chippewa National Forest OHV rules and regulations.
- Annually update the MVUM to accurately reflect resource conditions.
- Increase law enforcement efforts to take action on illegal OHV use.
- Continue to evaluate the forest transportation system through project level environmental assessments and implement these decisions (road closures / decommissioning).
- Identify unauthorized roads and temporary roads for decommissioning.
- Obliterate unauthorized user created OHV trails.
- Meet with the MnDNR to discuss analysis conducted since the 2004 Forest Plan. Specifically look for analysis of projected need and what is available on surrounding public lands for all types of recreational vehicles.
- Continue to improve and make available electronic trail mapping data in order for users to have instant mapping capabilities on electronic devices such as smart phones and I-pads.
- Allocate resources to construct and maintain approximately 1.5 miles of OHV designated trail on the Blackduck district.
- Work collaboratively with Itasca County to add 10 miles of OHV designated trails in the Deer River District area. Conduct the appropriate level of analysis to designate the trails as OHV.

7. Transportation Management

Key Points

- New system road construction has been virtually nonexistent in the past decade. Emphasis has been on decommissioning roads to reduce road miles.
- Coordination with local highway departments emphasizes safety on roadways with improved maintenance and provides a seamless interface with the neighboring public road agencies based on coordinated use, function and agency goals.

Monitoring Question

To what extent is the Forest, in coordination with other public road agencies, providing safe, cost effective, minimum necessary road systems for administrative and public use?

Results

The Forest Plan estimated 200 miles of roads would be decommissioned (O-TS-8). By the end of FY 2014, decommissioning occurred on 194 miles of road with another 234 miles reviewed and approved for decommissioning. Removing these roads from the transportation system aids the Forest is reducing miles of roads to maintain, increases interior habitat for wildlife, and protects waterways from erosion and sedimentation. Less than 1 mile of new system road was constructed in the past decade.



Table 7-1. Objective and Operating Levels.

Maintenance Level	OBJECTIVE ML	OPERATING ML	Difference Operating - Objective	Explanation	2014 % Maintained
1	278.32	263.58	14.74	Less operating at ML than planned	5%
2	1,433.72	1,692.66	-258.94	More operating at ML than planned	86 miles
3	249.77	191.27	58.50	Less operating at ML than planned	80% 424 miles
4	253.78	250.95	2.83	Less operating at ML than planned	
5	26.98	21.53	5.45	Less operating at ML than planned	
Decommission	234.03				
TOTAL	2,476.60	2,419.99			

Data: System = Forest Service = Jurisdiction; Status =Existing

The Forest manages almost 2,500 miles of roads of various maintenance levels. As appropriated maintenance funds and personnel to manage the road system decrease, the passenger car roads receive less than adequate maintenance and operate at levels below the objective level. The high clearance roads show a higher mileage than the objective, as some of the passenger car roads operate at a reduced level. In addition, roads that should be closed (maintenance level 1) are left open; and there are an additional 234 miles of roads that are yet to be decommissioned.

Sometimes an existing roadway has a higher public need for an improved road standard, such as needed for passenger car traffic. In these cases, the Forest develops road maintenance agreements with local highway departments to provide an improved level of service. Cass and Itasca Counties, and the Leech Lake Band of Ojibwe all renewed road maintenance agreements in the past year to maintain a portion of Forest Service system roads to provide better services to the public.

Recommendations

- Implement a Forest-wide inventory of unauthorized roads to determine the number, mileage, and condition of these roads. Incidental evidence indicates that they are prevalent on the forest but we are not tracking them or the resource damage they cause. Determine if these unauthorized roads should be added to the road system, decommissioned or closed.
- Systematically monitor decommissioned roads to ensure closures remain effective. Determine which types of closure are most effective to in specific situations so that we can build on this success. Coordinate internally on road closure opportunities using a variety of funding opportunities.
- Prioritize and implement the roads that have been approved for decommissioning. Monitoring for effectiveness.
- Develop a signing and education outreach to help explain to the public why specific roads are managed at certain operational maintenance levels.
- Coordinate with LLBO and other interested entities on road maintenance issues.

8. Watershed Health and Riparian

Key Points

- Impoundments are being removed to address quality concerns, restore aquatic organism passage and connectivity, and address safety issues.
- Monitoring of removals and improvements indicate that fish passage, connectivity, and aquatic objectives are being met.

Monitoring Question

To what extent is Forest Management affecting water quality, quantity, flow timing and the physical features of aquatic riparian, or wetland ecosystems?

Results

The Forest's primary method for obtaining aquatic ecosystem desired conditions is through responsible riparian, infrastructure, and watershed management. Projects that directly improve aquatic habitat have been tied to aquatic organism passage improvements at roads, decommissioning or modification of waterfowl impoundments, modification of lake outlet dams, walleye spawning habitat enhancements, and targeted beaver dam removals.

Impoundment Removals

Seven Forest waterfowl impoundments were removed in FY 2014. Reasons for their removal include water quality concerns, aquatic organism passage (AOP) problems and safety issues. The restoration of these sites is also driven by the Forest Plan watershed direction and aligns with many Forest Plan desired conditions, objectives, and goals. In addition to restoring AOP at all seven sites, natural hydrology was re-established in 359 acres detailed in the chart below:

Table 8-1. Impoundments removed and acres restored.

Impoundment	Ranger District	Restoration Acres
Loon Lake	Deer River	119
Pine Tree	Deer River	23
Highway 6	Deer River	14
Ketchum	Walker	51
Bag Lake	Walker	84
West banks	Deer River	19
Egg Lake	Deer River	49
	Total	359

Aquatic AOP Improvement Sites Monitoring and Results

Fish passage monitoring was conducted during the spring of 2014 to determine the effectiveness of past AOP improvements and at a planned AOP improvement sites. Prior AOP improvement sites include Sixmile Lake and Pigeon Impoundment and the planned AOP improvement site is Bear Brook Impoundment.



Six Mile Lake

The Six Mile Lake outlet dam was removed in 2012 and replaced with a series of rock arches to maintain lake water levels while providing passage to aquatic organisms. From April 22 until May 4, 2014, this site was monitored for adult fish migration within the rock arch series using trap nets. 128 individual fish were captured including 79 northern pike, 41 walleye, 7 white suckers, and 1 pumpkinseed sunfish. Juvenile and adult fish were observed traversing the upper rock arch into the lake. The results indicate that habitat and AOP objectives are currently being met at this site. Prior to the dam removal there was very little fish passage except under flooded condition.

Pigeon Impoundment

The Pigeon Impoundment control structure was removed in 2010 and a rock arch series was constructed in its place to provide AOP while maintaining waterfowl habitat in this high use impoundment. From April 22 until May 1, 2014, the site was monitored for adult fish migration within the rock arch series using trap nets. 148 individual fish were captured of which there were 81 northern pike, 66 yellow perch, and one bullhead. Traps were pulled prior to white sucker migration due to continual muskrat damage. Current and previous year's results show high levels of successful fish passage and indicate that habitat and AOP objectives are being met at this site. Prior to the removal, there was virtually no fish passage.

Bear Brook Impoundment

The Bear Brook Impoundment failed in 2013 and temporary repairs were made to stop erosion. The site is a complete barrier to aquatic organisms when it is both full and drawdown due to a narrow perched outlet pipe and an elevation difference between the downstream and the impoundment area. From April 22 until May 1, 2014 traps were set below the site to determine if migrating fish were using the site and would likely benefit from being able to access more habitat. 143 northern pike and 1 white sucker were captured. The site is being evaluated for AOP options in 2015 and if implemented, the site will be monitored for effectiveness in subsequent years. Implementation of this project will restore connectivity and fish passage on approximately five miles of quality stream habitat with the Upper Mississippi River Basin.

Other Accomplishments

- Since 2005, over 100 stream crossings, wildlife impoundments, and dams have been repaired, removed, or modified to minimize erosion, improve flow, and restore aquatic organism passage.
- Over 500 acres of wetlands have been reclaimed since 2004. This includes road obliteration, road relocation, and wildlife impoundment removal.
- Erosion control and water quality improvement resulted due to lakeshore stabilization of Six Mile, Portage, and Cass Lakes and 25 acres of lakeshore that was stabilized through maintenance/repair of boat accesses.
- Dumpsite cleanup has been ongoing for a number of years.
- 27 wells have been abandoned since 2004.
- Protective and proactive measures in riparian areas are being included in stand prescriptions. Unfortunately, proactive management goals are often not achieved. Harvesting in riparian areas needed to achieve diversity and planting objectives may not be done.

Implications

- Removals of impoundments, dams, and improvements to aquatic passages have been effective in restoring passage, connectivity, improving flows and reducing erosion.

9. Soils

The physical, chemical and biological characteristics of a soil determine how it performs its biologic, hydrologic and other ecological functions. Assessment of the soil properties contributes to an understanding of how soil productivity is being affected by management activities.

Key points

- Forest Plan Standards and Guidelines are being met.
- Expand monitoring to include long term monitoring and soil disturbance pre and post treatment.

Monitoring Question

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

Background

A national protocol, the Forest Soil Disturbance Monitoring Protocol (FSDMP) (Gen. Tech. Report WO-82b, September 2009), was used for monitoring. This protocol is designed to quickly assess changes to soil properties by evaluating:

- Forest floor depth
- Forest floor impacted
- Live plant
- Fine Woody (< 7cm)
- Coarse Woody (> 7cm)
- Bare Soil
- Rock
- Topsoil displacement
- Erosion
- Rutting (< 5cm, 5-10cm, > 10cm)
- Burning (light, moderate, severe)
- Compaction (0-10 cm, 10-30cm, 10-30cm)
- Platy/Massive/Puddled structure (0-10cm, 10-30cm, or > 30cm)

This protocol can be used on a variety of management activities, however, for 2014, all sites chosen where related to timber management (harvest and site preparation for planting). Seven sites were monitored, all of them post-treatment. Sites had management activities within the last year (6/2013 – 4/2014).

The method consists of evaluating a series of small (approximately 6 inch diameter circles). Each monitoring point is assigned a disturbance class based on the greatest degree of disturbance. For example, if an area showed ruts that were less than two inches (five centimeters) deep (disturbance class 1) and platy structure between 4-12 inches (10 and 30 centimeters) (disturbance class 2), the sample point was assigned an overall disturbance class of 2.

Finally, based on professional judgement, the evaluator decided if each sampling location had been detrimentally impacted. Areas that are detrimentally disturbed are not expected to return to a naturally functioning condition within a reasonable time (approximately 18 years) (NCASI, 2004). This decision was based on the intended harvest management objectives paired with the evaluator's judgment of the site's ability to restore ecological soil productivity (varies by soil type). The determination of detrimental is based on an evaluation of each individual point. The rest of the areas, even if in disturbance class 3, are expected to recover naturally before the next rotation period.

Additional details on the methodology and sampling design are explained in the soils report in the project file.

Results

The Chippewa National Forest monitored 7 post-treatment units in 2014. The results are shown in Table 9-1 for individual units and averages are presented in Table 9-2.

Table 9-1. Forest Soil Disturbance after Vegetation Management Treatments

Timber Sale	Unit ID	Disturbance Class (% of Unit)				Detrimental (% of unit)	Treatments	Soil Texture
		Class 0	Class 1	Class 2	Class 3			
West Missy Salvage	1	63	10	9	18	18	Clear-cut w/leave trees (12/2013) & Mechanical Site Prep (4/2014)	Fine sand to loamy fine sand
Natures Lake	06	100	0	0	0	0	Improvement Cut (6/2013)	Very fine sandy loam
Fourtown	12	100	0	0	0	0	Clear-cut w/leave trees (1/2013) & Mechanical Site Prep (7/2013)	Fine sandy loam
Fourtown	11	100	0	0	0	0	Two-aged shelterwood (1/2013) & Mechanical Site Prep (7/2013)	Fine sandy loam
Sucker Lake	002	78	6	6	9	9	Clear-cut w/ leave trees (7/2014)	Fine to very fine sandy loam
Santiago Salvage	001	100	0	0	0	0	Commercial Thin (3/2014)	Fine sandy loam to silt and very fine sandy loam
McDonald	20	88	10	0	2	2	Clear-cut w/ leave trees (3/2013) & Mechanical Site Prep (7/2013)	Loamy sand

Table 9-2. Forest soil disturbance monitoring class averages for the 7 units.

	Disturbance Classes (% of unit)				Detrimental (% of unit)
	Class 0	Class 1	Class 2	Class 3	
Averages	89.8	3.7	2.1	4.1	4.1

Implications

Table 9-2 shown above lists the average disturbance classes for all sites sampled in 2014 and the total percentage of sites listed as detrimental. The majority of the sites sampled showed no detrimental disturbance, however 2 of the sites sampled (West Missy and Sucker Lakes) exhibited higher percentages of detrimental disturbance-- 18% and 9%. The West Missy unit displayed a high percentage of detrimental disturbance within the locations of mechanical site prep. This site was disc trenched to prepare the site for planting. Soils between these trenches

were for the most part undisturbed. Planting was the desired goal for this unit and though soil disturbance was higher, the Forest considers this necessary for planted seedling survival. Table 9-3 below shows the averages without the West Missy unit.

Table 9-3. Post Harvest Forest Soil Disturbance Monitoring Class Averages for the 6 monitored units (without units with highest disturbance).

	Disturbance Classes (% of unit)				Detrimental (% of unit)
	Class 0	Class 1	Class 2	Class 3	
Averages	94.3	2.7	1	1.8	1.8

These six units displayed low soil disturbance. The data suggests that forest management practices are not resulting in significant changes to soil productivity.

Recommendations

- The two units that displayed high detrimental soil disturbance would be good longer term soil disturbance monitoring candidates, especially if compared to other mechanical prep sites with similar and different soils. This could aid in making mechanical preparation techniques more efficient and possibly less disturbing to the soil resource.
- Future Forest Soil Disturbance Monitoring should focus on collected data pre and post treatment in management units. Having the before and after data, will give a much better comparison on disturbance due to management practices in each unit. This information can be separated by multiple variables to show which treatments, season, and soil types indicate more or less disturbance.

10. Unit Monitoring

Key Points

Monitoring of treatment units from the July 2012 wind storm indicated the following:

- Complexity and scale of the project, limited stand data and site information at the time of planning, and changing personnel, appears to have limited understanding and accomplishment of project's restoration objectives.
- Generally treatments planned were appropriate, realistic, and implementable.
- Soil was adequately protected.
- Wildlife objectives for green reserve trees and snags were met given blowdown conditions and limitations in units treated.
- Fuels reduction activities along roads on the Pike Bay Experimental Forest appeared adequate.
- At the time of implementation there were changes in treatments that were not consistent with project objectives and expected outcomes. Coordination with the District Ranger and IDT regarding changes did not always occur. Concerns noted:
 - Treatment changes may not fall within the effects disclosed for the project.
 - Project objectives such as restoring fire to the landscape or forest type conversions may be compromised or not achieved.
 - Social perspective and context for commitments the Line Officer made to external groups and the need to follow-up with them was overlooked.

Further discussion is needed in the following areas:

- Better coordination is needed during project planning on how purchaser requirements for activity fuels could achieve fuels reduction objectives or facilitate prescribe burning.
- The potential use of herbicide treatments could be considered in future projects.
- Monitoring of disc trenching needs to occur followed by a discussion of the pros and cons of this treatment.

Background

The Forest monitored several harvest units that resulted from a July 2, 2012 windstorm. The windstorm damaged approximately 108,000 acres of National Forest land damaged to some degree. In response to the storm damage, the Forest prepared the Blowdown Restoration Project EA. The project decision, signed July 2013, included harvesting in damaged stands, fuels

reductions treatments, site preparation and conversion of aspen to other forest types, and prescribed burning in larger blocks to restore fire to ecosystems.

The project planning team had limited post-storm data on site conditions. Stand data provided some basic data on species in the stands but did not depict the extent of storm damage. Time and safety concerns did not allow for complete field review or verification of all the sites and proposed treatments. Decisions were based primarily on interpretation of post-storm aerial photos.

Monitoring Question

Monitoring and evaluation requirements will provide a basis for a periodic determination of the effects of management practices. 36 CFR 219.11 (d).

Monitoring Method

Four units harvested during 2013-2014 were selected for monitoring. Units represented a variety of treatments from fuel reduction, harvesting, site preparation and prescribed burning. Sites we looked at were on the Pike Bay Experimental Forest or in areas with high tribal interest.

The focus of the monitoring field day was to look at

- Fuels treatments to reduce fuel loadings in a designated buffers along roads in the Pike Bay Experimental Forest,
- Units harvested and planned for ecosystem burning, and
- A species conversion site converting aspen to jack pine.

At each site the vegetation, wildlife, soils, fire/fuels treatments were reviewed to determine consistency with direction as planned in the Environmental Assessment, implementation of Forest Plan standards and guidelines, mitigation measures, and effectiveness.

Results

- **Soils** --Landing locations were acceptable and size was minimal although there was some uncertainty regarding the location, current and past use of one landing. Some compaction on the landings was evident. Elsewhere, in one unit there was some compaction of top 3-5" but compaction was not evident below 5". No erosion and minimal rutting was noted. Slash was retained on skid trails when required to protect the soils. Old skid trails



were re-used when available. Soil surface structure was intact. Overall there was minimal soil disturbance. Adequate slash for coarse woody debris was retained. In some places there may have been too much slash potentially impeding regeneration establishment.

Further discussion is needed on the pros and cons of disc trenching. It is considered an effective and important tool by some in achieving site preparation for reforestation. On the other hand, we do not have good data on the effects to soils, plant communities, and non-native invasive species.

- **Silviculture and Vegetation** --On some sites, planned treatments were consistent with implemented treatments, thereby meeting objectives. On other sites, modifications occurred during implementation that are not consistent with achieving the planned objectives or desired conditions. There were changes in site preparation treatments, fuels treatments, prescribed burning plans, and planting of jack pine on an aspen site planned for conversion to conifer. Questioned was the feasibility of achieving desired conditions given the costs to convert an aspen site; yet, this is a Forest Plan objective and a treatment supported by the Tribe during the planning process. The targeted use of herbicides on these sites would make meeting objectives more economical and realistic to achieve.
- **Wildlife** --Green tree residuals and snags were left as appropriate and available but overall were limited. Marking of snags for retention was constrained because of the safety of working in blowdown.
- **Fuels and Fire** -- Fuels reduction objectives were met in the road buffer treatment. One of the objectives of the EA was to “restore fire to the ecosystem in larger burn blocks” for ecological and native plant community reasons. Prescribed burning was planned in the EA for units but was not being carried forward for implementation. Silvicultural prescriptions included burning but focused on fuels reduction and appeared to miss the ecological objectives. In addition, ecological objectives for burning were not clearly defined in the EA. Changes were not coordinated with the IDT or District Ranger and documentation was lacking.

Better discussion and coordination is needed during project planning on how purchaser requirements for activity fuels could achieve fuels reduction objectives or facilitate prescribe burning. For example, whole tree yarding, which the FS can require, could

eliminate the need for piling and burning of piles, or lopping and scattering of slash may not be necessary if piling and burning is going to be done. Biomass removal and utilization is not required in our contracts. Once slash is placed on the landing, it becomes an optional item with the purchaser to utilize this material as biomass.

Implications

- The complexity and size of the project, limited data and knowledge of site conditions, and changing personnel during planning and into implementation, appears to have limited understanding and follow through of project's restoration objectives.
- Changes in prescriptions and treatments were not consistent with project objectives, did not involve coordination with the IDT or the District Ranger. Commitments the District Ranger made to external groups and the need to follow-up with them was overlooked.

Recommendations

- Complex projects, or those crossing unit boundaries, warrant emphasis on coordination and understanding of the treatment goals and objectives.
- Coordination and discussion with the District Ranger and IDT needs to occur regarding changes treatments.
- Herbicide application to reduce tree competition could be considered in future projects.

11. Fire & Fuels

Within this chapter the topics of Fuels Reduction and Wildland Fires are discussed. Activities from FY 2010 – FY 2014 are included; 2010 was the last time fire and fuel information was reported in a Monitoring and Evaluation Report.

Fuels reduction section tracks the number of acres that are treated for hazardous fuels reduction through fire, mechanical treatment and timber harvest activities during FY 2014 and discusses how these treatments are meeting resource objectives. The Wildland fire section tracks the number of unwanted wildfires by causal category and acreage.

Key Points

- The Forest is meeting hazardous fuel reduction objectives for wet meadow and upland burning. Wet meadow treatments have been successful in reducing the number and size of person caused fires. The upland burning program is successful in reducing the fuel loading that contributes to increased fire behavior in wildland fire situations. In addition, these burns accomplish objectives for wildlife habitat improvement and restore fire to a fire dependent pine ecosystem.
- Fire statistics show person caused fires are the main cause of wildland fires on the Forest. These fires result in the most acres burned.
- The Forest Plan does not allow for the management of wildland fire for resource benefit, and thus all wildland fire is deemed to be unwanted wildland fire and actively suppressed to protect life and natural resources.

A. Fuels Reduction

Monitoring Question

How, where, and to what extent will prescribed fire be used to maintain desired fuels levels, and/or mimic natural processes, and/or maintain/improve vegetation conditions, and/or restore natural processes and functions to ecosystems?

Background

Based on reviewing the Forest Service Activities Tracking System (FACTS) database, the forest accomplished 44,372 acres of fuels reduction projects from 2010 through 2014. Of the total acres treated for fuels, 8,432 acres were accomplished as primary fuels

projects, and 35,940 acres were accomplished as integrated projects with other disciplines.

The Forest accomplished 15,394 acres of prescribed burning during that timeframe. The remainder of the acres were accomplished by mechanical means such as timber harvest (21,890 acres) or chipping, crushing, and piling of fuels (7,088 acres). Prescribed burning is comprised of three different types of burning: pile burning, broadcast burning (wet meadows and harvest slash), and understory burning (upland burning).

Pile Burning

The primary objectives of pile burning are to reduce fuels that result from some type of mechanical treatment. The majority of this burning focuses on fuels created during timber harvest activities. This type of burning activity accounts for roughly 1,207 acres during the 2010-2014 timeframe. The objectives include:

1. Consume at least 70% of the 1-hour and 10-hour fuels.
2. Consume at least 50% of the 100-hour and 1000-hour fuels.

Wet Meadow Burning

From a hazardous fuels standpoint, the objectives of these burns are related to fuels reduction, and moderating the potential fire behavior of the light flashy fuels to aid in suppression of a fire should one start in these areas. This burning accounts for 13,093 acres. The objectives included:

1. Remove 50% or more of the 10-hour fuels across 50 – 100% of the burn area.
2. Remove 50% or more of the 10-hour fuels across 75 – 100% of the burn area.
3. Top Kill 25% or more of encroaching brush on 50 – 100% of the burn perimeter.

Secondary objectives from this type of fire use are the reduction of shrubs species that encroach upon these meadows with the lack of fire, and also improvement of wildlife habitat.



Photo on the left depicts pre-burn conditions of brush prior to leaf out. Photo on the right depicts post-burn condition of brush which had been top killed by fire.

Upland Burning

The objectives for these burns may vary based on the overall objectives of each burn unit. Objectives may include removing understory vegetation such as balsam fir to decrease the ability of a surface fire to transition to a crown fire that may cause a stand replacing fire, or they may mimic a high frequency/low severity fire that would have historically been common in the pines stands of our Forest.

The Forest burnt 1,094 acres of uplands in 46 burn units. Generally the objectives for hazardous fuels reduction are:

1. Remove 75% or more of the 1-hour fuels.
2. Remove 50% or more of the 10-hour fuels.
3. On average, limit crown scorch on overstory pine to <50%.

Secondary objectives of these burns include stimulation of native plants such as blueberries, and improvement of browse for wildlife.



Photos above show pre and post-burn conditions of the sample site. Note the reduced surface fuels and fire-killed balsam fir in post-burn photo.

Results

Wet Meadow Burning

Based on monitoring wet meadow burns completed from 2010-2014, the Forest is meeting specified hazardous fuels reduction objectives. While the objectives are being met, the benefits from a fuels standpoint are short lived due to the fact that a new crop of fuel (meadow grass) will regenerate during the growing season. Until a new crop of grass has regenerated and cured, burning reduces the hazardous fuels and also the occurrence of human caused fires. These burns have been successful in reducing the

number and size of person caused fires within the Forest. In addition to fuels reduction, other resource benefits from burning include maintaining a meadow ecosystem and improving wildlife habitat.

Upland Burning

Monitoring results of the upland burning indicate the forest has been successful in meeting the hazardous fuels objectives for the upland burn units. Generally results exceed the objective of removing 75% of the 1 hour fuels within the units being burnt. The reduction of the 10 hour fuels exceed the objective of 50% removal of the fuels. Crown scorch of the overstory pine is typically within the 20-25% range for all units being burnt.

Monitoring results indicate that the upland burning program is successful in reducing the fuel loading that can contribute to increased fire behavior should a wildland fire occur within the burn units. By decreasing the fire behavior, the overstory pines have an increased ability to survive a wildland fire. Additionally, these burns may become effective areas for suppression activities due to decreased fuels loading and decreased fire behavior.

In addition to the removal of fuel loading, these burns accomplish secondary objectives of wildlife habitat improvement and restoring fire to a fire dependent pine ecosystem.

Looking back over the 2010-2014 timeframe, the Forest's prescribed fire program has been and continues to be successful in meeting the respective burn objectives. Given the limited burning windows, there is potential for increased success in the future, especially in the upland burning program, through different ways of doing business. An example includes utilizing larger burn units instead of many small units. Larger burn units would increase efficiency, reduce cost, and allow for better use of the limited burn opportunities. Other examples include integrating fuels needs with other programs such as wildlife, or engaging outside partners to increase funds and personnel that may be available to implement high priority burns. Many of these changes are already being implemented and success is being realized.

B. Wildland Fires

The presence of fire on the landscape is appropriate and desirable, but unwanted wildland fire is actively suppressed where necessary to protect life, investments, and natural resources (D-ID-6, FP p. 2-18).

Monitoring Question

What level of wildland fire on the landscape is appropriate and desirable and to what extent is unwanted wildland fire on the landscape suppressed?

Results

Monitoring tracks trends in the number and acres of wildland fires and the causal agents that are occurring on the forest. With this information, fire managers can determine future needs within the fire program such as changes to prevention needs, hazardous fuels treatments, etc.

Based on fire reports completed for wildland fires within the protection area of the Chippewa National Forest, there were 23 wildfires which burnt a total of 86 acres during FY 2014. These figures were short of the 20 year average of 48 fires and 264 acres for the forest. The smallest fire was 0.1 acres, the largest 36 acres, and the average wildfire acreage burned was 3.7 acre. All wildland fires on the forest were contained and/or controlled during initial attack operations.

For the years from 2010 through 2014, the forest has averaged 26 fires a year with an average of 109 acres a year. Table 11-1 displays fire name, acres burned, and year burnt for fires five acres or larger occurring between 2010 and 2014. Table 11-2 shows wildfire acres burnt during the past 5 years and also the 20 year average for each statistical cause. Table 11-3 shows the number of wildfires by statistical cause during the past 5 years and also the 20 year average.

Table 11-1. 2010-2014 Wildfires 5 Acres or Larger

Fire	Acres Burned	Year
Airport Road	7	2010
172	21	2010
Cedar	10	2010
Royale	11.5	2010
Cut Bank	67	2010
Mississippi	75	2010
Federal Ditch	5.6	2010
Airport Road	7	2010
County Road 4	24.6	2012
Tamarack Point	5	2012
Snowmobile Club	5.2	2012
Ball Club	61	2012
Snake	24.7	2012
Portage	38	2012
Little Winnie	6	2013
Knutson Dam	5.1	2013

Boggy Lake	6	2013
Ghost	5.8	2014
Boy Lake	36	2014
Anchor Point	5.3	2014
Highway 46	22.5	2014

Table 11-2. Wildfire Acres During Past 5 Years and Fire Cause

Cause	2010	2011	2012	2013	2014	20 Year Average
Lightning	.1	.1	.1	0	.1	3.4
Equipment	1.3	.5	2.2	.1	2	1.7
Smoking	.2	0	0	2.1	0	1.5
Campfire	2.6	0	5.6	.2	.1	9.7
Debris Burning	59.2	12.2	31.7	12.7	7.3	28.4
Railroad	0	0	0	0	0	0.4
Arson	77.6	0	99.1	3.2	44.8	171.9
Children	0	0	1.2	.1	0	2.7
Miscellaneous	90.8	.2	44.8	13.1	31.5	43.8
TOTALS	231.8	13	184.7	31.5	85.8	263.5

Table 11-3. Number of Wildfires by Statistical Cause During Past 5 Years

Cause	2010	2011	2012	2013	2014	20 Year Average
Lightning	1	1	1	0	1	1
Equipment	4	2	3	1	1	1.6
Smoking	2	0	0	2	0	.9
Campfire	2	0	6	1	1	3.2
Debris Burning	11	6	4	6	2	14.6
Railroad	0	0	0	0	0	1.3
Arson	8	0	12	4	0	14.25
Children	0	0	1	1	0	2.7
Miscellaneous	21	2	10	7	8	8.45
TOTALS	49	11	37	22	13	47.9

Looking at the statistics for wildland fires in FY 2014 and over a twenty year average on the Chippewa National Forest, it becomes obvious that person caused fires are the main cause of wildland fires on the forest. These fires are also the fires that result in the most acres burnt. The majority of the fires listed under the miscellaneous category are suspected to be person caused, but a definitive cause for the fire is not identified.

The Forest Plan does not allow for the management of wildland fire for resource benefit, and thus all wildland fire is deemed to be unwanted wildland fire and actively suppressed to protect life and natural resources.

Implications

- The Forest is meeting hazardous fuel reduction objectives for wet meadow and upland burning.
- Wet meadow treatments have been successful in reducing the number and size of person caused fires.
- The upland burning program is successful in reducing the fuel loading that contributes to increased fire behavior in wildland fire situations. In addition, these burns accomplish objectives for wildlife habitat improvement and restore fire to a fire dependent pine ecosystem.
- Fire statistics show person caused fires are the main cause of wildland fires on the Forest. These fires result in the most acres burned.

12. Costs

This section looks at trends in budget allocation, compares some costs today with those at the time of Forest Plan revision, and presents information on agreements and partnerships.

Key Points

- Costs of site preparation, planting, and seeding today are much higher than used in Forest Plan revision. Establishing jack pine is substantially more expensive than anticipated.
- Grants and agreements make an important contribution to provide work opportunities and to achieve resource accomplishments.
- Joint Chiefs Upper Mississippi Headwaters Restoration Project has increased collaboration and partnerships across all ownerships and resulted in the accomplishment of several successful projects.

Monitoring Requirement

How close are projected costs with actual costs?

Results

Annual Budget allocations

The budget allocations have remained relatively stable in recent years. There is roughly a \$514,000 (approximately 4%) difference between the low in 2012 and the high in 2014.

Table 12-1. Budget allocations for the Chippewa National Forest for FY 2011 through FY 2014.

Fiscal Year	Total Budget
2011	\$ 13,150,337
2012	\$ 12,840,897
2013	\$ 13,078,914
2014	\$ 13,355,300

Not reflected in total budget numbers are the annual fluctuations in program areas, often times fairly substantial depending on National and Regional emphasis areas. The dollars received do not necessarily align with the identified workload and have posed challenges. Note that the dollar figures in the above table have not been adjusted for inflation.

Comparison of Management Activity Costs

The Forest Plan identified costs for Management Activities in Table BEIS-2, (Appendix B, Volume II). Activities and 1998 costs used in Forest Plan revision are listed in the table below. For comparison purposes, 2014 average costs and the difference between planned and average

cost are also displayed. These costs have not been adjusted for inflation. Some of the costs have not changed much since 1998 (sale preparation and administration, release). However, there are some significant increases, primarily in planting, inter-planting, seeding, and site preparation depending on the site conditions. These differences are shown in the last column.

Table 12-2. Management activity costs from the Forest Plan (1998) and 2014.

Activity	Costs per acre (1998)	Average Costs per acre (2014)*	Difference per acre
Sale Preparation and Administration: clearcutting	119	119	0
Sale Preparation and Administration: thinning, shelterwood, partial cutting	152	152	0
Stocking survey	6	15	9
Site Preparation – combined mechanical and prescribed fire	115	300 (range 130-400)	185
Site Preparation – prescribed fire	143	250	107
Planting	218	400	182
Inter-planting	119	400	281
Seeding	36	150	114
Release (normal is 2.5 releases)	332	332	0
One Release	133	133	0
Browse protection for planted white pine	133	60	-73
Browse protection for natural white pine	53	60	7
Pruning for blister rust in white pine	124	124	0

*Costs are not adjusted for inflation.

The Forest Plan made some assumptions about the sequence of treatments needed to establish the forest types and the costs of doing so. Some of our most common harvest and post-harvest treatments are shown in table 12-3. The Forest Plan sequence of activities and the estimated costs at the time of revision are shown in columns 2 and 3 respectively (Table BEIS-3 and BEIS-4, Volume II, Appendix B). These can be compared to the 2014 sequence of activities and costs to establish a given forest type. Differences in cost per acre between planned and actual are shown in the last column.

Table 12-3. Comparison of activities and costs to harvest and regenerate forest types.

Forest Type	FP Activities (Vol II, Appen B)	FP Total Cost* (Vol II, Appen B)	Activities 2014	2014 Cost	Difference between Planned and Actual per acre
Jack pine	cc; half of sites require site prep; nat. regen; 20% interplant; surveys	206	CC; mech site prep entire site; plant; browse protection release; surveys	1226	1020
White pine	pc; site prep; nat. regen; release; browse protection; prune	782	pc; site prep; nat. regen; release; browse protection	844	62
White pine (conversion to)	pc; site prep, plant; release, browse protection; prune; surveys	1080	pc; site prep, plant; release, browse protection; surveys	1244	164
Red Pine	Partial cut; site prep; plant; release; surveys	823	Partial cut; site prep; plant; release; browse protection; surveys	927	104
Spruce/fir	cc; site prep; plant; release; surveys	790	cc; site prep; plant; release; surveys	1166	376
Northern hardwoods	Partial cut; one release; surveys	291	Partial cut; one release; surveys	300	9

Cc= clearcut; pc = partial cut; mech site prep = mechanical site preparation; nat. regen = natural regeneration;

There are some substantial differences in the sequence of activities used today. This is most notable for jack pine. To establish jack pine, activities today are more intensive and costs are much higher than planned for during Plan revision. Because of the dense brush on the majority of jack pine sites, mechanical site preparation is needed for the entire stand. Reforestation inventories have found that natural regeneration typically is not successful so planting is needed. Because of deer herbivory, browse protection is necessary as are several release treatments from the competing brush. Costs incurred are the same whether establishing jack pine for an existing jack pine forest type or converting some other forest type to jack pine.

For white pine, to harvest and then establish natural regeneration, costs have not changed much. To convert some other forest type to white pine, costs incurred in 2014 are roughly a couple hundred dollars higher, primarily because of the site preparation activity. Typically pruning is not done.

Treatment activities in red pine have not changed substantially except for the need for browse protection which elevates the cost per acre by about \$100.

Spruce/fir activities are essentially the same today but on some sites may be several hundred dollars more expensive to accomplish depending on the need for site preparation.

Costs to establish northern hardwoods are roughly comparable and assume only one release treatment although the likelihood is that two or more release treatments would be needed.

2004-2014 Grants and Agreements

Forest collaboration with external partners has been on the rise since 2005. The Grants & Agreements program on the Chippewa has seen an increase in the number of new partnership agreements in recent years. The table below represents the number of new agreements issued between 2005 and 2014 as well as the number of modifications to existing agreements during that time period.

Table 12-4. Number of agreements from 2005-2014.

Year	Number of New Agreements	Number of Modifications to Existing Agreements	Total Value of Agreements
2005	19	11	\$331,148
2006	32	11	\$611,830
2007	37	20	\$663,887
2008	37	23	\$549,768
2009	51	44	\$3,254,481*
2010	34	43	\$2,926,966*
2011	38	45	\$2,249,482
2012	36	42	\$2,551,755
2013	38	39	\$1,904,805
2014	40	56	\$2,493,773

*includes ARRA

Since 2005 the Forest has seen an increase in the number of partnerships with the Leech Lake Band of Ojibwe that benefit natural resource management on lands within the Forest and the Leech Lake Reservation. New agreements with LLBO in 2014 involved the following projects: tree planting, non-native invasive species monitoring and treatment, heritage resource surveys, fruiting shrub improvement, restoration of impoundments and a Master Stewardship Agreement.

The July 2, 2012 windstorm impacted the Forest in numerous ways. One aspect of the blowdown has been the need to reforest the areas affected by the windstorm. The Forest received funding in 2014 from the State of Minnesota through a Conservation Partners Legacy Grant and the National Forest Foundation to help purchase seedlings for reforestation efforts.

A major event for the forest in 2014 was providing the Capital Christmas Tree. A new partnership agreement was entered into with Choose Outdoors to provide support in bringing the tree to Washington, D.C. The Forest worked closely with the Leech Lake Band of Ojibwe on this project as well.

Secure Rural Schools funding was available in 2014 and Federal Financial Assistance Awards were made to three organizations for projects to improve watersheds and roads within Beltrami, Cass, and Itasca Counties.

Joint Chiefs: Upper Mississippi Headwaters Restoration Project (UMHR)

In 2014, the Chippewa National Forest and Minnesota NRCS were awarded one of 13 Joint Chief’s Awards across the nation. The goal is to improve the health and resiliency of forest ecosystems across a large landscape regardless of ownership. This project is designed to build on existing projects with local partnerships within the headwaters of the Mississippi River. The Mississippi Headwaters area includes the Chippewa National Forest, tribal and trust lands of the Leech Lake Band of Ojibwe (LLBO), and is interspersed with private, county, and state forest landowners.

2014 Accomplishments

The first year of this three-year project laid the groundwork for increased collaboration and resulted in many successful undertakings.

Table 12-5. 2014 Accomplishments Across All Ownerships

Activity Type	2014 Progress (acres)
Early Successional Habitat Development	50, 520
Site Prep for Reforestation	697
Non-Native Invasive Species (NNIS) Control	382
Hazardous Fuel Treatments	234
Forest Stand Improvement	70

- One of the many success stories was that it allowed the creation and funding of a Leech Lake Band of the Ojibwe (LLBO) “weed crew” to conduct inventories of new NNIS infestations, confirm older documented locations, and begin treatment.
- LLBO also transplanted sweetgrass (a culturally significant plant to the Tribe) from a partnership garden to appropriate new locations on the Forest.
- Native grasses were seeded in areas of recent NNIS treatments.
- Informative posters on invasive species were placed along trails.
- Site preparation occurred in areas impacted by a 2012 windstorm to expedite the reforestation of these lands.

- NRCS was able to increase their technical assistance and financial support to private lands by 426%. This work with private landowners created additional early successional habitat for species such as the Golden Winged Warbler, fuel treatments in the wildland urban interface, reduced the fire hazard in locations to increase public safety, and reduced the risk of catastrophic wildfire in areas with heavy fuel loading due to the 2012 storm.

Although much work has been completed, there is still a need for reforestation, hazardous fuels reduction, non-native invasive species control, and long term protection and management of this vital ecosystem.

13. Heritage Resources

Key point

- Mitigation and avoidance standards are effective in protecting heritage sites.

Monitoring Question

1) Are avoidance or mitigation measures effective and being followed as recommended in project designs; and 2) are heritage resources being affected in non-project areas?

Monitoring

The Heritage Program monitored eleven archaeological sites as part of its activities in 2014. The goal of the monitoring was to assess the current condition of each of the sites and determine if heritage sites are being affected by management or other actions.

Six of the monitored sites were in the Deer River District, three were in the old Cass Lake District, and two were in the Walker District. Seven of the sites monitored are Heritage Priority Asset sites that are monitored on a regular basis. Six of these are in recreational sites or campgrounds. The other site was formally part of a recreational site. The remaining four sites were monitored during other Forest Service activities which included watershed monitoring, a permit renewal, and paraprofessional training. Each of the sites was monitored by the Forest's Heritage personnel.

Results

The Forest determined that the avoidance and mitigation standards laid out for these sites were effective. None of the monitored sites showed evidence of being affected by FS or other activities.

Recommendation

- Continue with our mitigation and avoidance strategy.

14. Climate Change

Climate change is an issue that has grown in interest and science since the 2004 Forest Plan Revision. In recent years the Forest has been involved in several studies designed to provide insight to the potential effects of climate change. The Forest has also been active in several ways to help prepare for future ecological changes.

Key Points

- The Spruce and Peatlands Response Under Climate and Environmental Change (SPRUCE) project looks at the responses of peatland ecosystems to changed climate.
- Adaptive Silviculture for Climate Change (ASCC) on the Chippewa National Forest is in the early phases of development. It will look at responses of silvicultural treatments to resistance, resilience, and adaptability to climate change.
- Another cooperative study looks at managing black ash forests in the face of emerald ash borer (EAB) and climate change. Preliminary results indicate that group selection harvest coupled with a planting strategy appear to be a viable technique to convert the black ash stands to a different composition while minimizing risks of altered hydrology.
- The ongoing development of the LANDIS II model supports the Northwoods Ecosystem Vulnerability Assessment for the Chippewa NF.
- The Forest is addressing forest adaptation for climate change in our major vegetation projects using an approach in *Forest Adaptation Resources: Climate Change Tools and Approaches for Land Managers* (Gen Tech Rpt NRS-87, 2012) and Minnesota Forest Ecosystem Vulnerability Assessment and Synthesis: A report from the Northwoods Climate Change Response Framework Project (Gen Tech Rpt NRS-133, 2014).
- In 2014 the Forest achieved seven “Yes” answers on the Climate Change Scorecard, up from 5 in 2013.
- In 2014, the Chippewa National Forest co-hosted a Climate Informed Forest Management Forum and Field Day.
- The Forest restarted its Climate Response Charter Team to help further efforts to position ourselves in the face of Climate Change.

Cooperative Studies

The forest is involved in several cooperative studies in response to Climate Change.

The Spruce and Peatland Responses under Climatic and Environmental Change Experiment (SPRUCE) Project is designed to develop an understanding of the responses of carbon-rich

peatland ecosystems to changed climate. The Department of Energy and the USFS Northern Research Station collaborate in research efforts located on the Marcell Experimental Forest which is located on the Chippewa National Forest. Construction of the facilities is underway and the system will turn on in 2015. Once constructed these open air chambers will be control to elevate air and subsurface above ambient and will have a variety of additional CO₂ treatments.



Boardwalk constructed at Spruce Site. Photo taken in May of 2014. Open air chambers will be constructed around these boardwalks and a variety of experiments will occur inside the chambers.

Just initiated is the Adaptive Silviculture for Climate Change on the Chippewa National Forest which is part of a National program. The goals of this project are to test different silvicultural approaches to climate change adaptation that will serve as useful examples across the country. Research in red pine stands on the Cut Foot Experimental Forest will study the effects of applied silvicultural treatments to increase forests resistance, resilience, and adaptability to climate change. The decision for this project was signed in July 2014. Harvest occurred during the 2014-2015 winter. This cooperative project involves the Northern Research Station, the University of Minnesota, Michigan Technological University, the Northern Institute of Applied Climate Science (NIACS), and Chippewa National Forest.

The Forest also has a study underway in black ash lowlands that will provide predictions of how emerald ash borer (EAB) will affect northern Minnesota's forests, provide critical information for management aimed at mitigating the impacts of this exotic insect, and identify potential replacement tree species that may help transition and adapt these ecosystems to a future climate. The goal is to determine how the loss of ash will impact native plant communities, the spread of invasive species, and site hydrology. Four acre treatments plots (control, clearcut,

girdle, and group selection) to simulate EAB-induced ash mortality were implemented during the winter 2012. Planting with a variety of species occurred in 2013. Preliminary results indicate that group selection harvest coupled with a planting strategy appear to be a viable technique to convert the black ash stands to a different composition while minimizing risks of altered hydrology. The project is in cooperation with Northern Research Station, the University of Minnesota, and the Chippewa National Forest.

Development of the LANDIS II model is in progress through efforts with Portland State University (lead agency), Northern Research Station (Rhinelander, WI), and the Chippewa National Forest. The model will be used to simulate forest disturbance and succession in response to anticipated climate, natural disturbance, forest management, and their interactions across all land ownerships in the Chippewa National Forest landscape. The project supports the Northwoods Ecosystem Vulnerability Assessment by providing key components of the Northwoods Climate Change Response Framework for the Chippewa NF. Final model results are expected in late 2015.

Planning

The *Minnesota Forest Ecosystem Vulnerability Assessment and Synthesis* (Gen Tech Rpt NRS-133) was published May 2014. Several employees of the Chippewa National Forest were listed as co-authors for their work adding to the report and reviewing products.

The Forest is addressing forest adaptation for climate change using an approach in *Forest Adaptation Resources: Climate Change Tools and Approaches for Land Managers* (Gen Tech Rpt NRS-87, 2012). The Forest Adaptation Resources document includes a menu of adaption strategies and a workbook to incorporate climate change into existing management on the ground. Recent vegetation projects are taking into consideration species that are considered to be “winners” or “losers” with climate change and introducing or increasing species diversity into stands where appropriate.

Employee Education

Education of employees on climate change is ongoing. There have been formal training sessions, web-based training, and training that have accompanied our involvement with some of the studies, model development, and projects mentioned above. NIACS and several cooperating universities provided formal training and a field trip to discuss climate change. There are also a number of web-based training sessions available to all employees. In addition, Forest leadership and resource specialists have had various levels of involvement in the projects discussed above. Along with their participation comes resource specific training and

explanations from the researcher coordinating the projects. This involvement increases their knowledge and understanding of how our activities can respond to climate change.

During 2014 the forest helped to co-host a Climate Informed Forest Management Conference attended by more than 100 resource managers. As part of this conference we toured several of the research sites listed above and had useful discussions with a variety of managers on how to plan for Climate Change.

Climate Change Scorecard and Climate Change Charter Team

Several years ago, the Forest Service as an agency implemented a tracking system on efforts to prepare for Climate Change. The tool, referred to as a Climate Change Scorecard, has ten categories including:

1. Employee Education
2. Designated Climate Change Coordinators
3. Program Guidance
4. Science and Management Partnerships
5. Other Partnerships
6. Assessing Vulnerability
7. Adaption Actions
8. Monitoring
9. Carbon Assessment and Stewardship
10. Sustainable operations

For each of these categories there are a variety of actions that need to be completed. In 2014, we were able to achieve “Yes” answers to seven of the categories for the first time (categories 1-7). Although we are working to maintain our current answers and continuing to work on the remaining three items this does satisfy the national requirements. The three parameters that we still are trying to affirmatively answer include monitoring (element 8), carbon assessment and stewardship (element 9), and sustainable operations (element 10). For each of these items, we have developed an action plan and hope to make additional progress in 2015.

We also restarted our Climate Change Charter team to help organize and direct climate change related activities on the Forest. This small team is designed to lead implementation of the four dimensions outlined in the Climate Change Score Card (organizational capacity, engagement, adaptation and mitigation). The goals of this team include:

- Help implement Executive Order 13423 (Appendix A) that directs federal agencies to reduce our environmental foot print.
- Demonstrate the Eastern Region’s goal of “walking the talk for sustainability.”

- Achieve annual progress on the Climate Change Score Card by engaging employees.
- Elevate all employees' understanding of climate change triggers and responses.
- Advance our understanding of the environmental implications of climate change and related adaption and mitigation activities on forests and wetlands.

Recommendations

- Better implement climate change into our project planning efforts
- Continue the efforts in this area to achieve 10 Yes answers on the climate change scorecard.

15. Species Composition, Age Class Distributions and Objectives

Key Points

- The Forest is below the Decade 1 objectives for the amount of 0-9 age class, even with the blowdown event of 2012. This trend continues into decade 2 which takes into consideration treatments that are planned and under decision but have yet to be harvested. This trend holds true for all the LEs. The focus on commercial thinning of red pine stands contributes in part to these results.
- Conversely, the amount of mature/older on the landscape has steadily increased and exceeds decadal objectives for all the LEs.
- Jack pine and spruce-fir forest types are well below decadal objectives and contribute to an overall decline in the amount of conifer on the landscape, a concern noted for conifer dependent birds. Both species are expected to decrease according to climate change model projections.
- Amount of aspen on the landscape has declined since 2004 yet still exceeds the objectives for all LEs. Additional decreases in aspen are desired. Aspen is also a species expected to decrease with climate change.
- Northern hardwoods exceed objectives due to stand re-delineation and typing and recent stand data. Further increases in this forest type are expected due to regeneration treatments that promote the release of young hardwoods in stands.
- Jack pine, spruce-fir, red pine, and aspen are projected to decrease on the landscape according to climate change models.

Section A. presents summaries of Forest-wide figures for the 0-9 and mature /older (80+ years) age classes. Section B. presents a summary of forest types and trends. More detailed information on species composition and age classes for each of the Landscape Ecosystems (LEs) is contained in Section C.

Numbers were calculated in January 2015 based on data in FACTS (corporate database) and stand data. Decade 1 ended in 2014, 10 years after signing of the 2004 Forest Plan Revision. Decade 2 spans 2015-2024.

A. Summary of young (0-9) and mature/older (80+) year age classes

- Numbers were calculated based on harvest activities recorded in our database. In instances where the harvest was clearcut or coppice, age class should have been set back to "0" and these acres then contribute to the 0-9 age class. Stands with a basal area of 50 sq. ft. or greater did not contribute to the 0-9 age class.

- All planned but unaccomplished harvests were assumed to be completed in 5 years – year 2020.
- From the July 2012 windstorm, all damage class 4 and 5 (> 60% damage) stands that were not harvested were assigned to the 0-9 age class.
- For Table 2, LE age categories over 80 years were combined into one category: 80+.
- Acres and percentages may not be accurate if databases are not up to date and reflect the amount of even-aged regeneration harvest completed.

Table 15-1. Summary of 0-9 age class objectives for uplands by LE.

Landscape Ecosystem Uplands	LE acres	2003		Existing 2015		Objectives		2020	
		Acres	%	Acres	%	Decade 1 %	Decade 2 %	Acres	%
Dry Pine	12,000	1,800	14	1,527	12	12	10	1,147	9
Dry Mesic Pine	82,000	6,800	8	3,923	5	9	9	3,970	5
Dry Mesic Pine Oak	157,400	12,700	8	8,613	5	9	9	10,823	7
Boreal Hdwd Conifer	100,000	8,900	9	5,706	6	9	10	8,439	8
Mesic No. Hdwd	65,000	5,300	8	1,486	2	5	6	2,089	3
Tamarack Swamp	20,000	1,200	7	370	2	7	8	786	4
White Cedar Swamp	13,000	1400	11	516	4	6	6	489	4
Total		38,000	8	22,100	<5	8	8	27,700	6

Results

- Interestingly, for the 3 largest LEs: Dry Mesic Pine, Dry Mesic Pine Oak, and Boreal Hardwood Conifer, the 2004 Forest Plan projected for Decade 1 and 2 as much or more than the 2003 numbers of 0-9. The 2003 reflects 1986 Forest Plan direction which was heavy to clearcutting.
- In spite of the 2012 blowdown, the amount of 0-9 decreased for all LEs since 2003. Without the blowdown, the departure would have been even greater.
- In 2015, except for the Dry Pine LE, each LE is 3-5 % below the decade 1 objectives
 - The total of 0-9 for all LE acres is < 5%. Approximately 8% of all LE acres was expected for Decade 1; this is approximately a 16,000 acre difference.
- Although only half way through Decade 2, the amount of 0-9 is currently projected to be below objectives for Decade 2.
- Minimal harvest activity occurred in the lowlands although some increased activity is evident in the second decade in the tamarack swamp LE.

Table 15-2. Summary of 80+ age class Objectives for upland for mature and older forest by LE.

Landscape Ecosystem Uplands	LE acres	2003		Existing 2015		Objectives		2020	
		Acres	%	Acres	%	Decade 1 %	Decade 2 %	Acres	%
Dry Pine	12,000	1,100	8	3,033	25	19	17	3,294	27
Dry Mesic Pine	82,000	17,900	21	30,836	38	27	29	35,174	43
Dry Mesic Pine Oak	157,400	46,600	28	59,647	38	33	33	64,021	41
Boreal Hdwd Conifer	100,000	16,500	16	28,047	28	19	22	30,377	30
Mesic No. Hdwd	65,000	14,900	22	27,447	42	37	41	30,804	48
Tamarack Swamp	20,000	3,900	21	6,966	36	27	25	13,196	40
White Cedar Swamp	13,000	4,400	33	4,901	38	37	39	5,779	44
Total	449,400	105,000	23	160,877	<36	28	30	182,645	<41

Results

- Current and projected amounts of mature and older forest exceed the objectives for all the LEs even with the effects of the 2012 blowdown.
 - Acres increased from 105,000 in 2003 to 160,977 in 2015. This is a 55,000 acre increase that exceeds the objective by 35,000 acres.
 - The trend continues with an increase from about 161,000 acres in 2015 to 182,000 acres in 2020. In five years, mature and older increased by 20,000 acres and at this time exceeds the Decade 2 objective by more than 46,000 acres.

B. Summary of Forest types

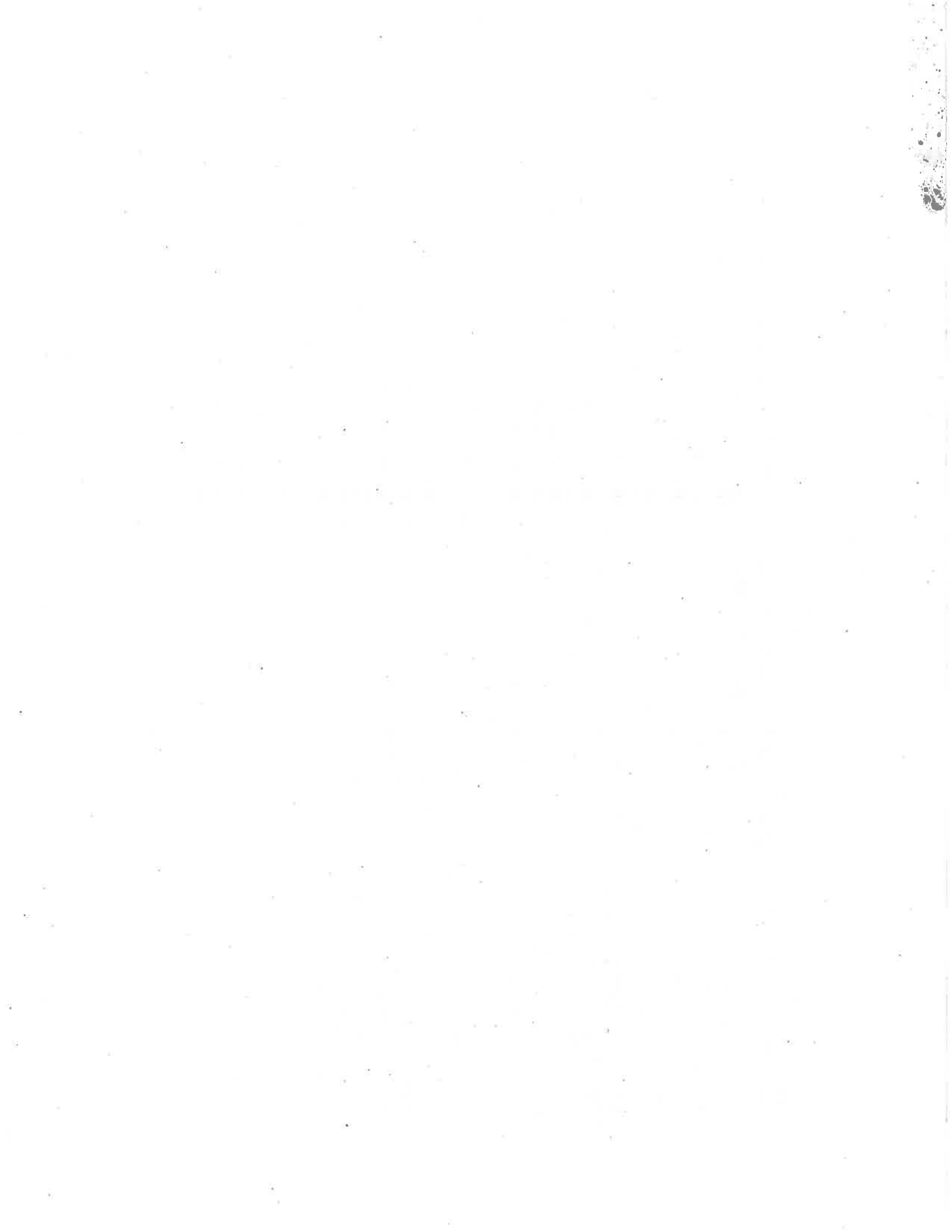
Table 15-3 provides a summary for each of the major forest types, the acres in the 0-9 and over 80+ years age classes, and the total acres in 2004, 2015, and projected decadal acres. Some key points are highlighted in the “Trends for Forest Type” column.

Results

- For conifers, decreases in jack pine and spruce-fir are counter to objectives. Acres of red and white pine (combined) have been consistent but an increase is desired. Overall conifer has decreased on the Forest landscape.
- For hardwoods, aspen is decreasing; further decreases are desired. Northern hardwood acres have increased substantially and exceed decadal objectives. Further increases are expected. This trend is not consistent with what was projected in the Forest Plan.
- Jack pine, spruce-fir, red pine, and aspen are projected to decrease on the landscape according to climate change models which is not reflected in our Forest Plan.

Table 15-3. Summary of Forest type acres and trends.

Forest Type	2004 acres	2015 acres	Decade 1 objective	Decade 2 objective	Trends for Forest Type
Jack Pine	0-9	2,200			<ul style="list-style-type: none"> • Downward trend in acres since 2004 • At half or less of decadal objectives for acres • Further decreases expected with climate change
	Mature/older (40+)	4,000			
	Total acres	10,-775	19,500	23,300	
Red & White Pine	0-9	3,600			<ul style="list-style-type: none"> • Acres fairly consistent since 2004 but below decadal objectives
	Mature/older (80+)	48,000			
	Total acres	78,000	84,000	90,000	
Upland spruce-fir	0-9	800			<ul style="list-style-type: none"> • Downward trend in acres since 2004 & well below decadal objectives • FEIS projects low levels of 0-9 • Aspen & jack pine expected to transition to spruce-fir as stands age.
	Mature/older (80+)	9,000			
	Total acres	21,000	34,000	37,100	
Aspen-birch	0-9	12,800			<ul style="list-style-type: none"> • Decrease in both 0-9 -and 80+ since 2004 as desired • Continue with desired declining trends • Further decreases expected with climate change
	Mature/older (80+)	90,000			
	Total acres	244,500	237,700	214,700	
Northern Hardwoods	0-9	2,700			<ul style="list-style-type: none"> • Currently exceed decadal objectives in part due to stand re-typing and recent stand data • Expect future increases due to aspen conversion to hardwoods • 80+ has substantially increased since 2004 • Resource mitigation makes harvesting economics marginal or infeasible.
	Mature/older (80+)	80,500			
	Total acres	81,700	64,300	69,000	



C. Species Composition and Age Class objectives by Landscape Ecosystem

Species composition and age class acres and percentages for 2015 are compared to Decade 1 objectives for each LE. The 2003 numbers are taken from tables in the Forest Plan on pages 2-60 through 2-74 and are included to provide a context for the shift and trends since the 2004 FP went into effect. The 2015 acres and percentages reflect what is accomplished and on the ground. For the age class tables, the 2020 column captures acres planned for harvest but are yet to be accomplished. It is assumed they will be accomplished in 5 years which places them in Decade 2. Generally, if movement is towards meeting Decade 1 objectives, then the Forest is on trajectory for meeting Decade 2 objectives. Lowlands are not discussed because so little harvest has occurred in them. Shifts in all forest types tend to be a function of succession, re-tying, and stand inventory rather than active management.

Dry Pine Landscape Ecosystem

Table 15-4. Species acres and percent.

Forest Type	FP 2003		2015		Objectives		2020	
	Acres	%	Acres	%	Decade 1	Decade 2	Acres	%
UPLANDS					%	%		
Jack Pine	3300	27	2756	23	35	41	2756	23
Red Pine	4900	41	4857	41	39	37	4857	41
White Pine	200	1	273	2	2	2	273	2
Spruce-fir	200	1	142	1	1	2	142	1
Oak	400	3	431	4	3	3	431	4
Northern Hdwds	100	1	462	4	1	1	462	4
Aspen	2700	23	2581	22	16	12	2581	22
Paper Birch	300	2	421	4	2	2	421	4
TOTAL	12,100	100	11,922	100	100	100	11922	100
LOWLANDS								
Black Spruce	300	71	178	46	71	71	178	46
Tamarack	100	13	58	15	13	13	58	15
Lowland Hdwds	100	13	26	7	13	13	26	7
White Cedar	<100	3	124	32	3	3	124	32
TOTAL	400	100	386	100	100	100	386	100
Non-forest			1742					

The Dry Pine LE is the smallest LE on the Chippewa National Forest, containing the smallest amount of upland acres of any of the LE's.

Table 15-5. Age class composition in acres and percentages.

Age Class	2003		2015		Objectives		2020	
	Acres	%	Acres	%	Decade 1	Decade 2	Acres	%
UPLANDS & LOWLANDS					%	%		
0-9	1800	14	1527	12	12	10	1147	9
10-39	5000	40	4588	37	45	45	4402	36
40-79	4700	37	3160	26	24	28	3465	28
80-179	1100	8	3030	25	19	17	3291	27
180+	0	0	3	0	0	0	3	0
TOTAL	12,500	100	12,308	100	100	100	12308	100
Non-forest			1742					

To meet objectives:

- Increase jack pine acres which can only be accomplished by conversions of red pine, paper birch and aspen to jack pine.
- Decrease aspen. Converting these acres to jack pine would be ideal if economically and technically feasible to accomplish.
- The 0-9 age class was met for Decade 1 primarily because of the July 2012 blowdown event
- The mature and older age classes tend to be over-represented.

Dry-Mesic Pine Landscape Ecosystem

Table 15-6. Species acres and percent.

Forest Type	FP 2003		2015		Objectives		2020	
	Acres	%	Acres	%	Decade 1	Decade 2	Acres	%
UPLANDS					%	%		
Jack Pine	1200	1	622	1	1	1	622	1
Red Pine	13000	15	12388	15	15	16	12388	15
White Pine	800	1	1073	1	4	6	1073	1
Spruce-fir	4000	5	2869	4	8	9	2874	4
Oak	5100	6	3293	4	6	6	3294	4
Northern Hdwds	12300	15	18486	23	15	15	18487	23
Aspen	38800	46	36512	45	41	37	36512	45
Paper Birch	9100	11	6306	8	10	10	6306	8
TOTAL	84,300	100	81,550	100	100	100	81555	100

Dry-Mesic- Pine/Oak Landscape Ecosystem

Table 15-8. Species acres and percent.

Forest Type	FP 2003		2015		Objectives		2020	
					Decade 1	Decade 2		
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
Jack Pine	9200	6	6699	4	9	11	6699	4
Red Pine	48900	30	48443	31	31	33	48443	31
White Pine	2500	2	2941	2	2	2	2958	2
Spruce-fir	7000	4	5404	3	5	4	5404	3
Oak	2900	2	3094	2	2	2	3094	2
Northern Hdws	13300	8	17516	11	10	11	17516	11
Aspen	65700	40	61862	39	34	30	61868	39
Paper Birch	13700	8	11857	8	7	7	11906	8
TOTAL	163,200	100	157,816	100	100	100	157887	100
LOWLANDS								
Black Spruce	10100	52	8849	44	52	52	8849	44
Tamarack	2800	15	3250	16	15	15	3250	16
Lowland Hdws	3500	18	3565	18	18	18	3565	18
White Cedar	2900	15	4487	22	15	15	4487	22
TOTAL	19,200	100	20,151	100	100	100	20151	100

Table 15-9. Age class composition in acres and percentages.

Age Class	2003		2015		Objectives		2020	
					Decade 1	Decade 2		
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
0-9	12700	8	8613	5	9	9	10823	7
10-39	58400	36	46151	29	35	34	40150	25
40-79	45600	28	43406	28	24	25	42892	27
80-119	41500	25	50029	32	27	24	51319	33
120-179	4400	3	8867	6	5	8	11829	7
180+	700	0	751	0	1	1	873	1
TOTAL	163,200	100	157,816	100	100	100	157887	100
LOWLANDS								
0-9	100	1	146	1	2	3	226	1
10-39	800	4	851	4	4	5	700	3
40-79	3300	17	3042	15	10	6	2375	12
80-119	11200	58	9504	47	53	38	8412	42
120-179	3600	19	6462	32	30	46	8178	41
180+	100	1	146	1	1	2	261	1
TOTAL	19,200	100	20,243	100	100	100	20151	100

LOWLANDS								
Black Spruce	3600	53	2893	39	53	53	2893	39
Tamarack	600	9	741	10	9	9	741	10
Lowland Hdwds	1600	24	2146	29	24	24	2146	29
White Cedar	900	13	1598	22	13	13	1598	22
TOTAL	6700	100	7378	100	100	100	7378	100

Table 15-7. Age class composition in acres and percentages.

Age Class	2003		2015		Objectives		2020	
					Decade 1	Decade 2		
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
0-9	6800	8	3923	5	9	9	3970	5
10-39	29900	36	23443	29	37	40	21560	26
40-79	29700	35	23349	29	27	22	20851	26
80-179	17800	21	30789	38	27	29	35127	43
180+	<100	0	47	0	0	0	47	0
TOTAL	84,300	100	81,550	100	100	100	81555	100
LOWLANDS								
0-9	<100	0	6	0	4	4	19	0
10-39	300	4	292	4	3	5	246	3
40-79	1200	18	625	8	7	5	509	7
80-119	3800	57	4076	55	57	45	3647	49
120-179	1300	19	2254	31	28	38	2824	38
180+	100	1	125	2	2	2	132	2
TOTAL	6700	100	7378	100	100	100	7378	100

To meet objectives:

- The largest species shifts need to be increases in spruce-fir, white pine, oak, and paper birch acres.
- Both the northern hardwoods and aspen will require significant decreases through conversions to meet decadal objectives.
- Increases are needed in the upland 0-9 age class which can only be accomplished through even-aged harvest. In 5 more years, there is a greater decline and departure in this age class. Even with the 2012 blowdown event, percentage is several points below the decadal objectives.

To meet objectives:

- Increase upland jack pine acres to more than double the existing amount. This would be difficult and expensive to accomplish given that surpluses are in the aspen and it is difficult to convert aspen stands to jack pine.
- Increase upland red pine and spruce-fir.
- Decrease upland aspen.
- Increase the upland 0-9 age class which is well below decadal objectives even with the blowdown event of 2012.
- Decrease the upland 40-79 age class acres. This could be achieved by regenerating mature stands within this age class.
- Decrease the upland 80-119 age class which is over-represented. Even-aged regeneration harvests would contribute substantially to the 0-9 age class.

Boreal Hardwood/Conifer Landscape Ecosystem

Table 15-10. Species acres and percent.

Forest Type	FP 2003		2015		Objectives		2020	
					Decade 1	Decade 2		
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
Jack Pine	500	0	402	0	0	0	402	0
Red Pine	3700	4	3580	4	4	4	3580	4
White Pine	600	1	550	1	3	4	550	1
Spruce-fir	11000	11	8069	8	12	13	8069	8
Oak	100	0	246	0	0	0	246	0
Northern Hdws	11800	11	17178	17	13	13	17178	17
Aspen	68400	66	64219	64	63	60	64244	64
Paper Birch	6900	7	5380	5	6	6	5380	5
TOTAL	102,900	100	99,625	100	100	100	99649	100
LOWLANDS								
Black Spruce	14800	49	12012	39	49	49	12012	39
Tamarack	2400	8	2922	9	8	8	2931	10
Lowland Hdws	9800	32	10821	35	32	32	10821	35
White Cedar	3300	11	5023	16	11	11	5023	16
TOTAL	30,300	100	30777	100	100	100	30786	100

Table 15-11. Age class composition in acres and percentages.

Age Class	2003		2015		Objectives		2020	
					Decade 1	Decade 2		
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
0-9	8900	9	5706	6	9	10	8439	8
10-39	48700	47	40026	40	47	45	35727	36
40-79	28800	28	25846	26	25	23	25106	25
80-179	16500	16	28044	28	19	22	30362	30
180+	0	0	3	0	0	0	15	0
TOTAL	102,900	100	99,625	100	100	100	99649	100
LOWLANDS								
0-9	200	1	324	1	4	4	746	2
10-39	1400	5	1514	5	5	8	1483	5
40-79	5100	17	3422	11	9	4	2274	7
80-119	16800	56	15419	50	52	40	13216	43
120-179	6500	22	9771	32	29	42	12618	41
180+	200	1	329	1	1	2	448	1
TOTAL	30,300	100	30,777	100	100	100	30,786	100

To meet objectives:

- Increase upland white pine.
- Increase upland spruce-fir.
- Decrease upland northern hardwoods and aspen. Convert to white pine or spruce/fir where feasible.
- Increase upland 0-9 age class which is below decadal objectives even with the blowdown event of 2012.
- Decrease the 80-179 age class which is over-represented. Even-aged harvests in suitable forest types would create 0-9.

Mesic Northern Hardwood Landscape Ecosystem

Table 15-12. Species acres and percent.

Forest Type	FP 2003		2015		Objectives		2020	
					Decade 1	Decade 2		
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
Jack Pine	100	0	102	0	0	0	102	0
Red Pine	2100	3	1940	3	3	3	1940	3
White Pine	500	1	434	1	1	1	434	1
Spruce-fir	4000	6	2654	4	6	7	2654	4
Oak	800	1	763	1	1	1	763	1
Northern Hdwds	20300	31	24438	38	32	37	24438	38
Aspen	32000	48	29466	45	47	43	29466	45
Paper Birch	6800	10	4966	8	10	8	4966	8
TOTAL	66,400	100	64,761	100	100	100	64791	100
LOWLANDS								
Black Spruce	3100	52	2373	37	52	52	2373	37
Tamarack	500	8	520	8	8	8	520	8
Lowland Hdwds	1900	31	2501	39	31	31	2501	39
White Cedar	500	9	1046	16	9	9	1046	16
TOTAL	6000	100	6440	100	100	100	6440	100

Table 15-13. Age class composition in acres and percentages.

Age Class	2003		2015		Objectives		2020	
					Decade 1	Decade 2		
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
0-9	5300	8	1486	2	5	6	2089	3
10-39	2200	33	19810	31	35	28	15858	24
40-79	24300	37	16017	25	24	26	16011	25
80-119	12800	19	24618	38	32	33	27016	42
120-189	2000	3	2737	4	5	8	3696	6
190+	100	0	92	0	0	0	92	0
TOTAL	66,400	100	64,761	100	100	100	64761	100
LOWLANDS								
0-9	<100	0	69	1	1	2	65	1
10-39	100	2	181	3	1	2	135	2
40-79	1400	23	835	13	12	6	592	9
80-119	3300	55	3699	57	57	51	3659	57
120-179	1200	20	1622	25	28	39	1899	29
180+	<100	0	35	1	0	1	91	1
TOTAL	6100	100	6440	100	100	100	6440	100

To meet objectives:

- Increase spruce-fir.
- Decrease aspen.
- Increase 0-9 age class which is below decadal objectives even with the 2012 blowdown event.
- Increase 10-39 age class.
- Decrease the 80-119 age class through regeneration harvest although some of this is needed to provide ingrowth into the 120-189 age class to meet Decade 2 objectives.

Tamarack Swamp Landscape Ecosystem

Table 15-14. Species acres and percent.

Forest Type	FP 2003		2015		Objectives		2020	
	Acres	%	Acres	%	Decade 1	Decade 2	Acres	%
UPLANDS					%	%	Acres	%
Jack pine	200	1	172	1	1	1	172	1
red pine	1300	7	1363	7	8	9	1363	7
white pine	<100	0	124	1	1	1	124	1
spruce-fir	1900	11	1678	9	16	21	1678	9
oak	200	1	355	2	0	0	355	2
Northern Hdwds	2000	11	3003	15	11	11	3003	15
aspen	10800	61	11390	58	56	49	11390	58
paper birch	1400	8	1416	7	6	5	1416	7
TOTAL	17,800	100	19500	100	100	100	19500	100
LOWLANDS								
tamarack	8400	27	8818	29	27	27	8818	29
Black spruce	14400	47	11218	36	47	47	11218	36
white cedar	4800	15	6715	22	15	15	6715	22
lowland hdwds	3200	11	4133	13	11	11	4133	13
TOTAL	30800	100	30884	100	100	100	30884	100

Very little harvest has occurred or is planned in this LE. Shifts have occurred in age class as a result of time resulting in ingrowth into the next older age class. Forest type shifts have occurred as a result of more recent stand data and photo re-delineation and stand typing.

Table 15-15. Age class composition in acres and percentages.

Age Class	2003		2015		Objectives		2020	
					Decade 1	Decade 2		
UPLANDS	Acres	%	Acres	%	%	%	Acres	%
0-9	1200	7	370	2	7	8	786	4
10-39	6500	36	6556	34	42	41	5465	28
40-79	6400	36	5608	29	23	25	5452	28
80-119	3400	19	5625	29	23	19	6085	31
120-189	400	2	1331	7	4	6	1688	9
190+	<100	0	10	0	0	0	23	0
TOTAL	17,800	100	19500	100	100	100	19500	100
LOWLANDS								
0-9	300	1	108	0	4	4	173	1
10-39	1300	4	1311	4	4	6	1066	3
40-79	5600	18	4918	16	11	8	3913	13
80-119	17300	56	14691	48	47	35	13135	43
120-179	6100	20	9663	31	34	46	12346	40
180+	200	1	193	1	1	1	251	1
TOTAL	30,800	100	30884	100	100	100	30884	100

White Cedar Swamp Landscape Ecosystem

Table 15-16. Species acres and percent by LE.

Forest Type	FP 2003		2015		Objectives		2020	
					Decade 1	Decade 2		
UPLANDS and LOWLANDS	Acres	%	Acres	%	%	%	Acres	%
Jack pine			22	0			22	0
red pine	0	0	12	0	0	0	12	0
spruce-fir	500	3	324	3	6	8	324	3
oak	0	0	2	0	0	0	2	0
No. hardwoods	200	1	571	4	2	2	571	4
aspen	8100	62	7871	61	57	52	7871	61
paper birch	0	0	220	2	0	0	220	2
black spruce	1100	8	899	7	8	8	899	7
tamarack	100	1	109	1	1	1	109	1
lowland hwdws	2300	18	2000	15	18	18	2000	15
white cedar	800	6	893	7	9	11	893	7
TOTAL	13,900	100	12923	100	100	100	12923	100

Table 15-17. Age class composition in acres and percentages.

Age Class	2003		2015		Objectives		2020	
					Decade 1	Decade 2		
	Acres	%	Acres	%	%	%	Acres	%
0-9	1400	11	516	4	6	6	489	4
10-49	4400	34	5543	43	46	49	5333	41
50-79	2900	22	1895	15	11	6	1321	10
80-109	2500	19	2206	17	16	12	2617	20
110-139	1300	10	1928	15	15	18	2237	17
140+	600	4	767	6	6	9	925	7
TOTAL	13,100	100	12855	100	100	100	12923	100

Very little harvest has occurred or is planned in this LE. Shifts have occurred in age class as a result of time resulting in ingrowth into the next older age class. Forest type shifts have occurred as a result of more recent stand data and photo re-delineation and stand typing.

III. ADMINISTRATIVE CORRECTIONS AND AMENDMENTS TO THE FOREST PLAN _____

The Chippewa National Forest Land and Resource Management Plan (Forest Plan) was revised in accordance with the 1982 Planning Rule. Since 2000, a number of planning rules have been in effect. Administrative corrections were made in accordance with the Planning Rule in effect at the time of the change. The most recent one, the 2012 Planning Rule, went into effect on March 23, 2012.

All of the changes to the Forest Plan thus far have been minor in scope. Our most recent change was a project specific amendment included in the Blowdown Restoration Project decision made July 2013.

Table 1 . Listing of Forest Plan amendments, corrections, or errata.

Type of Change	Date	Content
Amendment 1	11/15/2007	Change to Guideline on prohibited OHV use (G-ORV-1)
Amendment 2	06/04/2009	Change to North Winnie SPSNM Boundary
Amendment 3	07/19/2013	Project Specific amendment for mature and older jack pine forest (S-WL-10)
Administrative Correction 1	08/17/2006	Change to Glossary definitions
Administrative Correction 2	08/30/2006	Change to Monitoring Plan
Administrative Correction 3	08/18/2006	Change to Timber Management Guideline (G-TM-7)
Administrative Correction 4	08/18/2006	Change to Heritage, Recreation, and Access Guideline (G-WSR-7)
Administrative Correction 5	08/18/2006	Correction to Executive Summary Table
Administrative Correction 6	08/18/2006	Change to Watershed Health, Riparian Areas and Soil Resources Table (Table G-WS-8a)
Administrative Correction 7	08/18/2006	Change to SIO Map
Administrative Correction 8	09/18/2006	Change to National ORV Definitions
Administrative Correction 9	09/14/2007	Change to Proposed and Probable Practices
Administrative Correction 10	08/10/2009	Change to Boundary of Candidate Research Natural Area, Sunken Lake
Errata 1	08/18/2006	Change to Record of Decision (ROD)

In the near future we anticipate changes to our monitoring program (Forest Plan, Chapter 4) to bring it into alignment with direction provided in the 2012 Planning Rule (36 CFR Part 219.12).

The amendments, administrative corrections, as well as the corrected pages from the set of Plan documents can be found at:

<http://www.fs.usda.gov/main/chippewa/landmanagement/planning>. We encourage people to use this resource for accessing the most up to date information on amendments and administrative corrections. Future amendments will also be listed in the Chippewa NF *Schedule of Proposed Actions* which is distributed quarterly. We will continue to provide opportunity for public involvement at the project level and during any substantive changes to the Forest Plan.

IV. LIST OF PREPARERS

The following people collected, evaluated, or contributed time and/or data for this Monitoring and Evaluation Report.

Name	Discipline
Sharon Klinkhammer	Forest NEPA Coordinator/ Planner
James Gubbels	Forest Timber Program Manager
Gary Swanson	Forest Silviculturist
Millie Baird	Transportation Engineer
Christine Brown	Recreation and Lands Program Manager
Todd Tisler	Fish & Wildlife Program Manager
Cory Mlodik	Blackduck District Wildlife Biologist
Jeremy Cable	Monitoring, Inventory & Survey Team Supervisor
Neil Peterson	Tribal Liaison
Kim Jenkins	Budget & Accounting Officer
Brenda Frenzel	Grants Management Specialist
John Rickers	Resource Information Manager
Sean Dunham	Heritage Program Manager
Brian Jenkins	Fire & Fuels Specialist
Jeremy Back	Soils Program Manager
Eric Raitanen	Fisheries Biologist
Kirk Larson	Forest Botanist and NNIS Program Manager
Jim Gries	Natural Resource Team Leader

