



United States
Department of
Agriculture

Forest
Service

**Eastern
Region**

R9-FL-ME
Report

October 2021



Finger Lakes National Forest

Annual Monitoring and Evaluation Report

Fiscal Years 2014, 2015, and 2016



Looking west toward Seneca Lake

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, 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, audiotape, American Sign Language, etc.) should contact the State or local Agency that administers the program or contact USDA through the Telecommunications Relay Service at 711 (voice and TTY). 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 [How to File a Program Discrimination Complaint](#) 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, Mail Stop 9410, 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.

Photo credit: USDA Forest Service

Table of Contents

Approval	ii
1. Introduction.....	1
Monitoring Plan	1
Monitoring Implementation Guide.....	1
Annual Monitoring Schedule.....	2
Annual Monitoring and Evaluation Reports.....	2
Annual Monitoring and Evaluation Report Outline	2
2. Discussion of Monitoring	3
Aquatic Habitat.....	5
Aquatic Population - Lakes	5
Fire.....	6
Forest Health.....	8
Heritage	10
Human Dimensions	11
Invasive Species Population	13
Lands	16
Program Management.....	17
Range.....	24
Rare Plants Population.....	25
Recreation.....	27
Soils	35
Terrestrial Wildlife Habitat	37
Terrestrial Wildlife Population.....	39
Vegetation.....	40
Water	42
3. List of Preparers.....	44
Appendix A: Payments to Towns	45
Appendix B: Threatened, Endangered and Sensitive Species (Fauna and Flora).....	47
Appendix C: Literature Cited.....	51

Annual Monitoring and Evaluation Report Fiscal Years 2014, 2015, and 2016

Finger Lakes National Forest

USDA Forest Service, Eastern Region
October 2025

This Annual Monitoring and Evaluation Report combines monitoring completed in fiscal years 2014, 2015, and 2016 for the Finger Lakes National Forest Land and Resource Management Plan (Forest Plan) dated 2006. Monitoring and evaluation of forest plans is required by the National Forest Management Act and associated planning regulations at 36 CFR 219 dated September 30, 1982. The Finger Lakes National Forest monitoring plan is described in Chapter 4 (Monitoring and Evaluation) of the Forest Plan. Monitoring consists of mandatory components found in every forest plan, as well as monitoring that is tailored to address specific Finger Lakes National Forest resource concerns raised from public involvement and Forest Service interdisciplinary team review.

Approval

I have reviewed the *Finger Lakes National Forest - Fiscal Years 2014, 2015, and 2016 Annual Monitoring and Evaluation Report* including its findings, conclusions, and recommendations. I conclude the report meets the intent of both the Forest Plan (Chapter 4) as well as the 1982 36 CFR 219 regulations.

John A. Sinclair
Forest Supervisor
Green Mountain & Finger Lakes National Forests

Date

1. Introduction

Monitoring and evaluation reporting is required by the National Forest Management Act and associated 1982 planning regulations (36 CFR 219.12(k)) to determine how well the Finger Lakes National Forest (FLNF) Land and Resource Management Plan (Forest Plan) is being implemented. The *Finger Lakes National Forest - Fiscal Years 2014, 2015, and 2016 Annual Monitoring and Evaluation Report* documents the results of the monitoring accomplished during fiscal years 2014 to 2016 (October 1, 2013, to September 30, 2016). The report describes monitoring items by resource category, provides data pertaining to the effects and effectiveness of Forest Plan management direction, and discusses various resource management efforts implemented during fiscal years 2014, 2015, and 2016. A major part of the report is to determine if the resource outputs, management costs, returns, and environmental objectives were achieved as envisioned in the Forest Plan.

Monitoring Plan

Chapter 4 of the FLNF Forest Plan (Monitoring and Evaluation, or Monitoring Plan) includes programmatic direction for monitoring and evaluating Forest Plan implementation. Chapter 4 defines the over-arching, strategic questions that must be addressed by the Forest Service through monitoring, including broad timetables and schedules for analysis and reporting.

In addition to direction for monitoring and evaluation, the Forest Plan describes the FLNF goals, objectives, and desired future conditions. The Forest Plan allocated land to different management areas, each with unique desired future conditions, major emphasis, and management direction.

Specifically, monitoring and evaluation provides a basis to determine:

- Whether Forest Plan implementation is achieving multiple resource goals, objectives, and desired conditions
- If application of standards and guidelines are effective in maintaining the productivity of the land
- If conditions or demands in the area covered by the Forest Plan have changed significantly enough to require a revision to the Plan

The Forest Plan may also be amended to adapt to new information and changed conditions identified through monitoring and evaluation efforts. Through this adaptive management approach, the Forest Plan is kept current.

Monitoring Implementation Guide

In addition to the programmatic direction provided in the 2006 Forest Plan, Forest Service staff completed the *Monitoring Implementation Guide* (also referred to as the Monitoring Guide) in 2007. The monitoring guide provides more specific procedural guidance to implement the monitoring strategy outlined in the Forest Plan. The guide contains specific monitoring elements, along with methods, protocols, and analytical procedures to be followed. The monitoring guide is a suite of monitoring activities used to help Forest Service staff understand and answer the Forest Plan monitoring questions. Based on information garnered through annual monitoring and evaluation reports, the monitoring guide has been updated to incorporate suggested changes since 2007. The annual monitoring and evaluation report for fiscal years 2014, 2015, and 2016 is based on the 2012 Monitoring Guide.

Annual Monitoring Schedule

The *Annual Monitoring Schedule* outlines monitoring items, time frames, roles, and locations for the upcoming year and is linked directly to both the 2006 Forest Plan and the Monitoring Guide. The Forest Service prepares and revises this schedule as necessary as part of the annual work planning process. Some monitoring items are performed or measured annually, whereas others are scheduled with different time intervals that are determined necessary or appropriate for timely and effective evaluation. The schedule was last updated in 2012.

Annual Monitoring and Evaluation Reports

Annual monitoring and evaluation (M&E) reports provide a forum for the review of current-year findings including:

- What monitoring activities were completed?
- What Forest Plan monitoring questions were addressed?
- How well did the monitoring address those questions?
- Do future monitoring activities need modification?

Comparison of results with those from previous years can identify trends and highlight where management is or is not achieving desired goals. It is during this annual review that Forest Service staff can determine if changes to the 2006 Forest Plan or the Monitoring Guide are necessary.

Annual M&E reports are prepared by an interdisciplinary team of Forest Service specialists that incorporate information gathered from various sources including partners, private citizens, and non-profit organizations. The Forest Service is grateful to the people who contribute their monitoring efforts and results and who take an interest in actively participating in the management of the FLNF.

Annual Monitoring and Evaluation Report Outline

This report is divided into three chapters:

- Chapter 1 is the introduction providing an overview of the monitoring program.
- Chapter 2 includes the detailed results of the monitoring and evaluation of elements specified in the Monitoring Plan, Guide and Schedule. Each element includes background information, a brief explanation of the monitoring activities and protocols, evaluation of monitoring results, and conclusions or recommendations.
- Chapter 3 is a list of the Forest Service staff that provided information for the report.

The activities and outputs monitored may be traced to one of three sources:

1. The 1982 planning regulations associated with the National Forest Management Act (36 CFR 219 dated September 30, 1982) which outline specific activities and outputs to be monitored.
2. Forest Plan requirements (Chapter 4) selected to facilitate comparison between actual conditions and desired future conditions.
3. Questions derived from public comments which are particularly useful for monitoring public satisfaction with the resources and services provided by FLNF.

2. Discussion of Monitoring

The following table (Table 2-1) consists of elements from Tables 4.1-3 through 4.1-7 of the Forest Plan. It identifies the resource element, monitoring question and driver, and frequency of measurement that are discussed in this report.

Table 2-1. Resource areas, monitoring questions and drivers, and measurement frequency.

Resource Element		Monitoring Question(s)	Monitoring Driver	Frequency of Measurement
1	All	How close are actual outputs and services to projected outputs and services?	A quantitative estimate of performance comparing outputs and services with those projected by the 2006 Forest Plan.	Annual
2	All	How close are actual costs to projected costs?	Documentation of costs for carrying out the planned management prescriptions as compared with costs estimated in the Forest Plan.	Annual
3	All	To what extent have Objectives been attained?	Forest Plan Objectives	Annual
4	All	To what extent have Standards and Guidelines been applied?	Forest Plan Standards and Guidelines	Annual
5	All	What are the effects of management practices prescribed by the 2006 Forest Plan?	Forest Plan Management Area Guidance	Annual
6	Transportation System	Is the use of vehicles off roads causing considerable adverse effects on resources or other forest visitors; how effective are forest management practices in managing vehicle use off roads?	Regulation requirements (36 CFR) 295 that use of vehicles off roads shall be planned, implemented and monitored in order to protect resources and visitors from considerable adverse effects, promote public safety, and minimize conflicts with other NFS land uses of the NFS lands	Annual
7	Recreation	Is the quality of the Forest Service trail system and recreation facilities being improved through operation and maintenance?	Forest Plan Goal 11	Annual
8	Soil	To what extent are Forest Service management and restoration activities maintaining or improving soil quality?	Forest Plan Goal 3	1-5 Years
9	Water	To what extent is Forest management affecting water quality, quantity, flow timing, and the physical features of aquatic, fisheries, riparian, vernal pool, and wetland habitats?	Forest Plan Goal 4	1-5 Years
10	Wildlife: Management	To what extent are forest management activities providing habitat for MIS?	Forest Plan Goal 2, Maintain and restore quality, quantity, amount, and distribution of habitats to	Annual

	Resource Element	Monitoring Question(s)	Monitoring Driver	Frequency of Measurement
	Indicator Species		produce viable and sustainable populations of native and desirable non-native plants and animals.	
11	Native and Desired Non-Native Species	To what extent are management activities contributing toward population viability for native and desired non-native species? To what extent do management activities contribute toward restoration and maintenance of habitat for native and desirable non-native species?	Forest Plan Goal 2	Variable
12	Vegetation	Are harvested lands adequately restocked according to Plan goals?	Lands are adequately restocked as specified in the Forest Plan.	Annual
13	Insects and Disease	Are insect and disease levels compatible with objectives for maintaining healthy forest conditions?	Destructive insects and disease organisms do not increase to potentially damaging levels following management activities.	Annual
14	Interpretation and Education	In what way is the Forest Service providing information and education opportunities that enhance the understanding of the FLNF?	Forest Plan Goal 12	Annual

Aquatic Habitat

Evaluation Question: Pond Habitat

Monitoring Question: To what extent do Forest Service Management activities contribute toward restoration and maintenance of habitat for native and desirable non-native species?

Detailed Monitoring Question: Is habitat quality and quantity being maintained in FLNF ponds? Is aquatic vegetation encroaching upon more of the surface area of ponds? Are water control structures well maintained and support adequate water levels in ponds?

Monitoring Activities: In fiscal year 2014, a survey was completed on 83 ponds on FLNF which included an assessment of whether aquatic vegetation covered over or under 50 percent of the pond surface. Qualitative monitoring of water control structures is conducted by Forest Service staff on an ongoing, opportunistic basis.

Evaluation & Conclusions: A total of 37 of the 83 ponds surveyed (about 46 percent) had under 50 percent surface coverage by aquatic vegetation. The 2012 FLNF Monitoring Guide discusses pond monitoring and indicates that vegetative cover of 50 percent or less is the desired condition; however, this is not a defined Forest Plan objective. The 2014 data indicate that fewer than half of the ponds assessed are meeting this metric, but data points before or after this assessment are not available and a trend cannot be determined. Information related to the condition of any control structures during the fiscal years 2014 to 2016 monitoring period was not recorded or reported in a way that allows for discussion of Forest Plan implementation or effectiveness. However, the Forest Service staff have continued to identify pond control structure maintenance needs and regularly works toward funding and completing the needed maintenance.

Recommendations: Monitoring the estimated pond coverage by aquatic vegetation should be accomplishable; however, the monitoring guide should be improved to better define a process and objective. The monitoring guide also references data related to pond levels relative to capacity, but this is not clearly represented in the guide and should be removed or clarified. Monitoring of control structures could be effective at the 3 to 5 year time-scale or in response to potentially damaging events. Better guidance for how to record and store information related to pond control structures would also be helpful.

Aquatic Population - Lakes

Evaluation Question: Pond Fisheries

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

Detailed Monitoring Question: Are fish populations in ponds being maintained at levels to sufficient to support recreational fisheries or natural reproduction? If not, is supplemental stocking or habitat improvement required?

Monitoring Activities: Monitoring for this item was not completed or is not available for the fiscal years 2014 to 2016 monitoring period.

Evaluation and Conclusions: Evaluation of pond fisheries cannot be completed.

Recommendations: The monitoring plan components related to this question (e.g., variables/ parameters, units of measure, etc.) could be improved or clarified. More qualitative measures might be more appropriate to help ensure that monitoring is achievable and can help answer the monitoring question.

Fire

Evaluation Question: Prescribed Fire

Monitoring Question: What are the effects of management practices prescribed by the 2006 Forest Plan?

Detailed Monitoring Questions: Is prescribed fire effectively used as a tool to meet management objectives set forth in the Forest Plan? Are prescribed burns meeting the fire effect objectives set forth in each burn plan?

Monitoring Activities: There were no wildland fires managed for resource benefit. Most prescribed fires successfully met objectives with exception to some wildlife units that were “greening up” with too high fuel moisture to effectively consume vegetation.

The forest is actively reintroducing fire into historically fire adapted landscapes on a small scale in grasslands and shrublands for wildlife habitat. Proposals to apply prescribed fire to the landscape oak have been considered, but not planned to implement as a silvicultural treatment.

The prescribed fire monitoring program was developed over the course of the fiscal years 2014 to 2016 monitoring period utilizing burn severity and composite burn index to track both first and second order fire effects and pollinator plant response. Focus of fuels monitoring has been finding the most suitable place on the landscape for fire where plant communities are fire-adapted and the ability to implement safely against constraints of forest plan standards and guidelines.

Evaluation and Conclusions: Criteria for managing wildfire for resource benefit excludes most of FLNF based on high Wildland Urban Interface component. Interdisciplinary fire effects monitoring is needed to enhance future application of fire on the landscape.

Recommendations: Consider areas of historical fire regime along with current fire science and research during Forest Plan revision to plan future management where prescribed or wildfire would otherwise be excluded.

Evaluation Question: Fire Agreements

Monitoring Question: To what extent have Standards and Guidelines been applied?

Detailed Monitoring Question: How many agreements have been developed and maintained with outside partners?

Monitoring Activities: Some local agreements currently exist with cooperators. An annual operating plan exists with New York State agencies. Research of existing agreements through NRM and grants and agreements personnel found: Six (6) local agreements were in place with cooperators, but all expired in 2014, and one (1) operating plan was in place with New York State agencies.

Evaluation and Conclusions: Maintaining local agreements would allow agency fire managers and cooperators to communicate resource needs more effectively and allow for compensation for equipment and personnel used during suppression activities. The current Annual Operating Plan with the New York State agencies allows for resource sharing with the state but does not cover local volunteer fire departments or other cooperators. Active agreements increase cross-boundary training opportunities and allow sharing of materials, resources, and personnel to implement these trainings. Active agreements also support Forest Plan implementation by having a defined fire response agreement in place with local and

state cooperators. The longevity of local agreements is three years and reviewed annually for amendment updates.

Recommendations: Initiate new and maintain existing local agreements to aid cross-boundary communication and interactions with local and state cooperators. These agreements will allow for reimbursement of expenses for equipment and personnel responding to wildfire occurrences on federal lands.

Evaluation Question: Hazardous Fuels

Monitoring Question: To what extent have Standards and Guidelines been applied?

Detailed Monitoring Question: To what extent have hazardous fuels been reduced?

Monitoring Activities: The entire FLNF is within the Wildland Urban Interface (WUI). Approximately 900 acres were treated with prescribed fire during the fiscal years 2014 to 2016 monitoring period. Prescribed fire complexity analysis contributes to primary hazardous fuels reduction efficiency. Primary hazardous fuels activities consist of prescribed fire in the WUI with objectives to enhance wildlife and pollinator habitat of both shrublands and grasslands. Secondary hazardous fuels activities include mowing and mastication for wildlife habitat, grazing, and disposal of non-native invasive plants.

Evaluation and Conclusions: Best management practices are followed when implementing prescribed fire activities. The WUI and various constraints and project specific mitigation measures increase complexity of implementing prescribed fire acres.

Recommendations: Managers should continue working across program areas to optimize prescribed fire application.

Evaluation Question: Fire Prevention

Monitoring Question: To what extent have Standards and Guidelines been applied?

Detailed Monitoring Questions: How many wildfires were suppressed with no reportable accidents/injuries or damage to private property? How many acres of private property burned from fires with ignition on Forest Service land?

Monitoring Activities: Wildcad report was queried by the Northeastern Interagency Coordination Center (NECC) to track the number of wildfire occurrences on FLNF. Other methods that would be available to query would be Firestat or Inform. The New York State fire managers are also a method of data collection in the event a fire response by a cooperator occurred but was not entered into any of the databases listed previously.

Mixed severity fires occur annually but are small, typically less than half an acre but occasionally up to 15 acres. Stand replacement fires in mixed wooded vegetation are at a return interval of 200 (+) years and are 1,000 (+) acres in size (LANDFIRE Rapid Assessment Vegetation Models).

An average of 3 fires per year occurred on NFS lands during the fiscal years 2014 to 2016 monitoring period. The average size was 1 acre which with a total of three acres annually. The number of fires responded to by cooperators was not readily available, but it can be confidently assumed that there were more wildfire occurrences during this time span than were reported. With this in mind, it is assumed that five fires occurred per year with an occasional outlier of 10 to 15 acres in a grass fuel model.

Evaluation and Conclusions: Wildfire suppression activities were effective and met all associated Forest Plan goals and objectives. Human-caused fires are the leading cause of wildfires on NFS lands and occur annually. Prescribed fire implementation is reducing the fuel loading thus reducing the availability of fuels for combustion in the event of an unplanned ignition. These activities along with continued public education on the hazards of wildfires will likely keep wildfire size, intensity, and occurrences lower.

Recommendations: Increase prescribed fire activities on the landscape to reduce the availability of fuels and decrease the fire behavior and intensity for wildfires that do occur.

Forest Health

Evaluation Question: Increase of Destructive Insects and Diseases

Monitoring Question: Are insect and disease levels compatible with objectives for maintaining healthy forest conditions?

Detailed Monitoring Question: To what extent have destructive insects and disease organisms increased?

Monitoring Activities: A variety of monitoring activities are conducted at the State and national forest level by several different agencies and organizations. Forest Service staff review this data and cooperate with partners to assess forest health conditions, supplementing observations made during inventory and management activities. Monitoring efforts during fiscal years 2014 to 2016 are summarized in Table 2-2.

Table 2-2. Insect and disease monitoring conducted in fiscal years 2014 to 2016.

Insect or Disease Agent	Organization & Date of Monitoring	Type of Monitoring Effort
Sirex wood wasp (<i>Sirex noctilio</i>)	NY Department of Environmental Conservation (DEC), FLNF, ongoing	Statewide survey, stand inspections and walk-through examination.
Hemlock Woolly Adelgid (<i>Tsugea adelges</i>)	Cornell University Entomology Dept., NY DEC, FLNF and partners, ongoing	Walk-through with foliage inspection. Mapping/description of infestation site.
Root diseases and invasive insects	USDA Forest Service - Northeastern Area State & Private Forestry, ongoing	Stand inspections and walk-through examination.
Thousand Cankers Disease (TCD)	NYS Department of Conservation, FLNF, ongoing	Statewide surveys, stand inspections and walk-through examinations.
Defoliation, dieback or mortality from any insect or disease agent	NY DEC aerial survey, flown summer 2015 and 2016	Annual Aerial Detection Surveys of forest health conditions statewide.

Monitoring is increasing because of the higher risk for more non-native insect and disease pests to infest NFS lands. Currently Sirex wood wasp and hemlock woolly adelgid (HWA) occur on FLNF and emerald ash borer (EAB) has been found in the county. There is also potential for thousand canker disease (TCD) to afflict black walnut. Gypsy moth populations have been low and defoliation has been minimal, although the potential exists for future outbreaks.

In New York, damage mapped from the 2014 forest health aerial survey totaled about 36,000 acres of the approximately 10 million acres surveyed statewide by air. This was a significant decrease in damage detected from the previous year. Much of the difference is attributed to the collapse of gypsy moth populations in western New York. In 2015, gypsy moth defoliation accounted for about two thirds of damage mapped.

A major drought impacted forest health conditions in most of New York in 2016. In July, nearly a quarter of the State was considered to be in “severe” drought status by the National Drought Mitigation Center,

the worst drought in New York since the drought center began compiling statistics in 2000. Drought is expected to cause significant stress on trees and plant communities on FLNF and throughout the State. This stress will likely be compounded with other factors and effects may be seen for several years.

The HWA population on FLNF continues to grow and hemlock mortality is increasing as evidenced by surveys and walk-through examinations. Despite the establishment of biocontrol agents on NFS lands (*L. nigrinus*), significant hemlock mortality is expected unless further management is conducted. Hemlock elongate scale has also been detected in hemlock stands at Caywood Point, and is likely increasing mortality. Mark Whitmore (Cornell University), Will Brendecke (Forester, FLNF), Isabel Munck and Michael Bohne (FHP, DFO) surveyed Caywood Point in October 2012. It was determined that the high value hemlocks at the site should be treated with insecticide to prevent further mortality. A biological evaluation for the proposed suppression and prevention project was completed by Forest Health Specialists from the DFO in fiscal year 2013. The Forest Service contracted out the systemic application of *imidicloprid* and basal bark application of *dinotefuran* on 300 large hemlocks covering 134 acres in seven stands at Caywood Point. In 2015, a Decision Memo approved the Hemlock Woolly Adelgid Suppression Project, authorizing chemical and biological treatments for HWA on 2,872 acres on FLNF. Treatments were implemented in several stands in 2015 and 2016, with additional treatments planned for future years.

A variety of silvicultural techniques can be used to increase forest diversity and resilience in the face of stressors. Field assessments and inventory to support the Finger Lakes Invasive Pest Study (FLIPS) continued in 2015 with a final environmental assessment and Decision Notice anticipated for early 2017. This decision will authorize silvicultural treatments and commercial harvest to mitigate forest health risk on up to 800 acres.

Evaluation and Conclusions: Insect epidemics and resulting population numbers vary greatly from year to year, resulting from a combination of susceptible host habitats, favorable weather conditions, and previous year population levels. Individual tree mortality within mature stands increases as the forest ages. Current harvest levels are low on FLNF and average stand age is increasing. The most extensive forest damage observed in fiscal years 2014 to 2016, was the defoliation and mortality of hemlock resulting from HWA and hemlock elongate scale infestation. Sirex wood wasp has been identified on FLNF, but surveys have not yet shown extensive damage. Non-native and off-site softwood plantations are most at risk from Sirex wood wasp. Forest health risk in these stands is high due to high stem density and overstocking. Planted species and genetics are also not well adapted to sites in many stands. Light gypsy moth defoliation has also been observed on FLNF, as well as white pine needle damage. Beech bark disease continues to affect beech trees throughout the Forest.

EAB has been positively identified within 30 miles of FLNF and is considered a significant pest of concern. Oak wilt has also been detected in New York but has not yet been found near FLNF. Other non-native insects and diseases of risk that have not been identified in western New York include Asian longhorned beetle, southern pine beetle, winter moth, and the agents that cause thousand cankers disease, and sudden oak death.

Insect and disease levels at present do not significantly impact Forest Service management to maintain forested conditions and objectives, however significant forest health risks exist, particularly for eastern hemlock, ash species and softwood plantations. Increasing mortality in plantations should be monitored and salvage opportunities should be evaluated. These stands should also be evaluated for conversion to a more resilient, diverse mix of native species. Forest staff should continue to monitor insect and disease activities, and review data from available aerial and ground detection monitoring efforts. Monitoring of HWA should be prioritized given recent population increases and the need for treatment. Monitoring for EAB and siren wood wasp should also continue. EAB is currently the most significant invasive insect species in the State, although treatment options are limited.

Recommendations: No changes to monitoring and evaluation measurements, indicators or methodology are recommended.

Heritage

Evaluation Question: Heritage Resource Program Objectives

Monitoring Question: To what extent have Forest Plan Objectives been attained?

Detailed Monitoring Question: Have Heritage Resource program management objectives related to: backlogged site evaluations; meeting curation guidelines; developing a Geographic Information Systems (GIS) model for prehistoric site locations; increasing partnerships for Section 110 activities; consulting with State Historic Preservation Officers (SHPO) and Tribes; and incorporating heritage components into historic building management plans been addressed?

Monitoring Activities: During fiscal years 2014 to 2016, a minimum of two outreach and stewardship opportunities were conducted involving archaeological site tours and public presentations. Partnerships continued with Western Michigan State University to analyze artifacts collected from historic farmsteads on FLNF, and one site evaluation was conducted at the FLNF Hector Ranger Station.

No tribal consultations were noted during this monitoring period; however, Forest Service staff attended an introductory meeting between the Oneida and Tribal Relations Specialist Larry Heady to learn about the tribe's interests and identify ways to work together in the future.

No other data was recorded for FLNF.

Evaluation and Conclusions: Section 110 Heritage Program Managed to Standard (HPMtS) goals were met from the outreach and stewardship opportunities during this monitoring period. Progress has been made to evaluate cultural resources on FLNF, however, there has been little to no progress on deferred maintenance projects.

Recommendations: Continued partnerships and outreach with local historical societies and the Western Michigan State University is important for the recurring interest received from outreach opportunities. Consultation efforts with Federally recognized tribes need to continue and expand to ensure their project-specific concerns are being met and they are receiving Forest-wide representation.

Evaluation Question: Heritage Resource Site Protection

Monitoring Question: To what extent have Forest Plan Objectives been attained?

Detailed Monitoring Question: Have Heritage Resources across the FLNF been inventoried and protected?

Monitoring Activities Approximately 800 acres of broad scale inventory of cultural resources were conducted during fiscal year 2016 for the Finger Lakes Invasive Pest Strategy (FLIPS) Project. One site monitoring was also completed in fiscal year 2015. All heritage sites are protected with implementation of Forest-wide standards and guidelines, and project specific mitigation measures.

Evaluation and Conclusions: Cultural resource monitoring forms are prepared for each archaeological site identified during the monitoring surveys to highlight current or potential impacts to the resource. The condition assessments demonstrate which sites need maintenance, such as vegetation or erosion management.

Recommendations: Continued inventorying and monitoring of cultural resources on a rotating schedule is necessary to mitigate or document adverse effects as they arise.

Evaluation Question: Heritage Resource Standards and Guidelines

Monitoring Question: To what extent have Forest Plan Objectives been attained?

Detailed Monitoring Question: Have heritage resources within the “Areas of Potential Effect” of FLNF-sponsored projects (undertakings) been protected and managed according to Forest Plan Standards and Guidelines?

Monitoring Activities: Although several projects were reviewed in accordance with Section 106 of the National Historic Preservation Act (NHPA) during fiscal years 2014 to 2016, heritage program data was not readily available specifying which projects were reviewed. Projects with a determination of No Adverse Effect were protected from management activities through mitigations measures or exclusion boundaries. Mitigation measures were added to the eight sites that were identified in association with the FLIPS project. No data was available during this monitoring period specifying if monitoring occurred post-implementation of any projects.

Evaluation and Conclusions: A review of project activities is necessary for compliance with the NHPA and allows for historic properties to be identified and mitigation measure applied prior to project implementation. Post-project monitoring efforts provide the necessary data to confirm site protection mitigation measures were followed and provides opportunity to adjust mitigations needs for future projects to reduce potential effects to the resource.

Recommendations: Continue using Forest Plan-level Standards and Guidelines, and project-specific design criteria and/or mitigation measures to ensure the preservation of cultural resources. Working with project proponents before and after implementation will help ensure protection measures are met.

Human Dimensions

Evaluation Question: Partnerships Maintenance and Enhancement

Monitoring Question: To what extent have Forest Plan Objectives been attained?

Detailed Monitoring Question: Are partnerships active and effective on the Finger Lakes National Forest and are Forest Service personnel participating in partnership activities?

Monitoring Activities: Agreements with partners, such as challenge cost-share agreements and participating agreements, are recorded for the Green Mountain and Finger Lakes (GMFL) National Forests (combined) in the Natural Resource Management database, including partner cash, non-cash and in-kind contributions (Table 2-3). Reporting contributions from partner agreements is a consistent, accurate method for reporting contributions; however, it is recognized this does not account for all annual volunteer hour contributions. Volunteer hours are reported inconsistently and there is no accurate way to depict annual volunteer contributions at this time for GMFL. Similarly, there is no consistent data collection effort to document and quantify the number of partners engaged in any given year since many partners may informally collaborate with the GMFL outside of a signed agreement.

Table 2-3. Partner agreement contributions in New York and Vermont from fiscal years 2014 to 2016.

Fiscal Year	Non-Federal Contributions	Other Federal Contributions	State Contributions	Total
2014	\$501,960.30	\$95,111.59	\$0.00	\$597,071.89
2015	\$485,282.47	\$0.00	\$33,000.00	\$518,282.47
2016	\$222,699.69	\$210,000.00	\$0.00	\$432,699.69
Total	\$1,209,942.46	\$305,111.59	\$33,000.00	\$1,548,054.05

In addition to monitoring agreements, individual and group volunteer contributions were recorded over the monitoring period (Table 2-4).

Table 2-4. Volunteer contributions in New York and Vermont from fiscal years 2014 to 2016.

Fiscal Year	Number of Volunteers	Total Hours Contributed	Equivalent Fund Contribution	Percent of Full-Time Employee Contributed
2014	66	320	\$7,216.00	0.18
2015	26	5,054	\$116,595.78	2.81
2016	113	6,821	\$159,702.76	3.79
Total	205	12,195	\$283,514.54	6.78

Evaluation and Conclusions: Over the fiscal year 2014 to 2016 monitoring period, partners contributed over \$1.5 million dollars to National Forest System management (Table 2-3) (USDA Forest Service, 2025b) and volunteers contributed the equivalent of \$283,514.54 and the equivalent human-power of 6.78 full-time employees (Table 2-4). Most of the funds contributed (78 percent) are from non-federal contributions, such as non-profit matches. Other federal contributions make up 20 percent, for example an Air Force agreement supporting wildland fire operations, and state contributions make up 2 percent.

Partner contributions recorded in agreement data often reflect the ability of the Forest Service to fund an agreement, wherein the partner is required to make a substantial match, typically a minimum of 20 percent. When the Forest Service is able to contribute more funding into a challenge cost-share agreement, the resulting partner matching contributions rise. From fiscal years 2014 to 2016, the Forest Service projected wildfire suppression costs to be hundreds of millions of dollars over the available budget. As a result, funds from programs such as recreation and wildlife were necessary to cover the shortfall, limiting the available agreement dollars. Solutions to end the “fire borrowing” practice are anticipated by 2018.

Recommendations: No changes are recommended.

Evaluation Question: Teacher Professional Development in Forest Stewardship

Monitoring Question: To what extent have Objectives been attained?

Detailed Monitoring Question: Did teacher professional development in Forest stewardship occur?

Monitoring Activities: During fiscal years 2014 to 2016 monitoring consisted of recording the number of teachers trained and programs offered.

Evaluation and Conclusions: Forest Service staff continue to provide teacher/student development and programming annually in an effort to educate the next generation of National Forest users. This work comes in several forms including outreach to schools, outreach to teachers and providing in-person programming delivered by Forest Service staff. In addition, agreement/funding opportunities and natural

resource programming are annually provided to cooperating partner organizations. Public education of Forest Stewardship through community events is ongoing. It is estimated that approximately 12 programs per year occur geared toward educating teachers, students, partners, and the public.

Recommendations: Continue to provide professional teacher development opportunities through the continuation of outreach programs and facilitate ideas to encourage families and children into the natural world.

Evaluation Question: Payments to Towns

Monitoring Question: To what extent have Objectives been attained?

Detailed Monitoring Questions: What was the amount paid to each FLNF town through PILT, 25% fund or Secure Schools. What type of communications have occurred on this topic with each town?

Monitoring Activities: There are two types of federal payments reaching municipalities that have NFS lands: 1) Payments in Lieu of Taxes; and 2) Public Law 106-393, Secure Rural Schools and Community Self-Determination Act of 2001, reauthorized in 2008. Payments in lieu of taxes funds are directed to towns, and the Public Law 106-393 funds are directed to school districts. See Appendix A for additional information on the federal payments and specific payment information for each FLNF town.

Evaluation and Conclusions: Towns are sent information regarding payments as soon as it is released.

Recommendations: Continue informing towns of the status of the Payment to Towns legislation as well as yearly appropriations.

Invasive Species Population

Evaluation Question: Non-native Invasive Species

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

Detailed Monitoring Question: To what extent are non-native invasive species impacting other Forest resources?

Monitoring Activities: The impact of non-native invasive plants (NNIP) on FLNF resources has been monitored by surveying the extent of infestations in areas identified for protection, or in areas most likely to be sources of seeds or plant propagules that could be dispersed into areas to be protected. It also includes monitoring any treatments. All data was gathered using the USDA Forest Service Natural Resources Information System (NRIS) protocol, to be entered into the NRIS corporate database. All sites monitored provide baseline information that can be used during ongoing implementation NNIP control activities authorized by the 2008 Forest-wide Invasive Plant Control Project decision.

Botanical inventory for both NNIP and rare plants occurred in the following locations:

Fiscal Year 2014 (285.2 acres)

- Late growing season inventory at Caywood Point Recreation and Education Special Area (215 acres)
- Late growing season inventory of all 86 ponds (70 acres) on FLNF

Fiscal Year 2015 (444.7 acres)

- Early growing season inventory at 1) Caywood Point Recreation and Education Special Area (215 acres); and 2) all 86 ponds (70 acres) on FLNF
- Shannon grassland for grazing (159.5 acres)

Fiscal Year 2016 (712.7 acres)

- Stands proposed for harvest as part of the Finger Lakes Invasive Pest Strategy (FLIPS) project

Caywood Point was prioritized for survey because cursory field visits suggested it was the most ecologically unique site on FLNF and highly infested. The ponds were also prioritized because FLNF is located at the top of the watershed, and any NNIP present could potentially be spread throughout the watershed, depending on hydrological connectivity of waterbodies, or ability of aquatic wildlife or recreational users to spread them. The FLIPS project required inventories to meet Forest Plan standards and guidelines for invasive species; forest management activities have the potential to introduce and spread non-native invasive plants, which could then hamper tree regeneration or alter habitat for desirable plant and animal species.

Caywood Point is not only ecologically unique, but also infested with a wider variety of NNIP than any other site on FLNF. Existing NNIP includes two trees, seven shrubs, two woody vines, one herbaceous vine, five forbs, and one grass. Multiflora rose, Morrow and related honeysuckles, and common buckthorn are all found throughout the entire 215-acre parcel, and garlic mustard is close to being as widespread as the shrubby NNIP. Most of the remaining species are in small patches of less than an acre to a very few acres.

Multiflora rose, Morrow honeysuckle, common buckthorn, and garlic mustard were also the most common NNIP in the FLIPS project area, but only four other species of NNIP were found. One of these was Japanese barberry, which is believed to create good microsites for deer ticks. Sites were quite variable; some had almost impenetrable NNIP thickets, and others had more native plant communities.

Three aquatic NNIP were found in the 82 FLNF ponds surveyed. Eurasian watermilfoil was found in four ponds, curly leaf pondweed was found in 12 ponds, and water chestnut was found in two ponds. Although the management goal is for no ponds to be infested, especially since FLNF is on top of the watershed, 21 percent of ponds found to be infested is good progress to control NNIP.

Non-native invasive plant treatment occurred in the following locations:

Fiscal Year 2014 (1086.7 acres)

- Knapweeds and thistles were broadcast sprayed in eight grasslands (756.6 acres).
- Woody NNIP were masticated in parts of two grasslands (28.8 acres) and spot sprayed 2 parts of 2 others (26.5 acres); this is intended to be followed up by future foliar sprayed herbicide of regrowth.
- Woody NNIP were cut back using chainsaws in one grassland for wildlife (274.8 acres); this is intended to be follow up by future foliar sprayed herbicide of regrowth.

Fiscal Year 2015 (849.8 acres)

- Knapweeds and thistles were broadcast sprayed in eight grasslands (779.5 acres).
- Knapweeds and thistles were treated by foliar spot spraying in wet areas in six grasslands (70.3 acres), which requires a different herbicide than can be broadcast sprayed in upland habitats.

Fiscal Year 2016 (527.8 acres)

- All NNIP were treated at most of Caywood Point (170.1 acres).
- Knapweeds and thistles were broadcast sprayed in one grassland (134.2 acres).

- Hand-sprayed herbicide was used in eight grasslands and one wetland creation site (60 acres).
- Ahouse West grassland was divided into three sections (163.5 total acres) to compare three methods of treating woody NNIP: foliar spot spray (71.3 acres), manual using shovels and a weed popper (63.2 acres), and Buckthorn Baggies® and some hand-pulling (29 acres). The foliar spot spray was most effective.

Evaluation and Conclusions: Most monitoring protocols were efficient and easy to use and allowed the assessment of short-term effectiveness of the treatments. Broadcast herbicide in grasslands is generally effective at reducing knapweeds and thistles in grasslands, and most effective when a grassland is sprayed two to three times over a period of a few years. Foliar spot-spraying the same species using different herbicide in wet areas (required, since the herbicide broadcast sprayed in uplands is not legal to apply in wet areas) is less effective and allows these habitats to continue to be a source for reintroducing these species to the rest of the grassland. Foliar spot-spraying woody species is generally effective though it needs more than one treatment. The same method used on garlic mustard is minimally effective, most likely due to the extensive seed bank. Cutting woody NNIP is only temporarily effective at knocking back these shrubs and needs to be followed by foliar spot spray of regrowth. Buckthorn Baggies® only kill about 40 percent of shrubs treated, and temporarily reduce growth on the remaining 60 percent.

Forest Plan Goal 2 directs management to “maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals” (Forest Plan, p. 10). Management activities have complied with this direction by having rare plant and NNIP inventories completed at Caywood Point and at all FLNF ponds. Knowing what NNIP are present, along with what rare plants occur there that need protection, allows the development of effective treatment plans. Management activities also complied with Forest-wide Pests, Diseases, and Non-Native Invasive Species Standard S-1 (Forest Plan, p. 28) by incorporating information on the status and threat of invasive species in FLIPS project development.

We are discovering that it is never enough to treat infestations one or two times. The reasons for this vary; in some cases, the treatment method is simply not 100% effective, and in other cases, the method might be effective, but there is an abundant NNIP seed source in the soil. It is also very difficult to prevent new infestations that can arrive at a site by several means, including wind, rain, wild and domestic animals, and human activity of all kinds.

Recommendations: Despite successful NNIP control treatment challenges, the monitoring question measurements, indicators, and methodology seem to be working, although they assess only the extent of infestations and effectiveness of treatments, not the impact on other resources. Impact on other resources may be best assessed qualitatively by specialists who manage other resources. For example, a silviculturist may recognize reduced tree seedling regeneration in a forest heavily infested with garlic mustard, and a range manager may notice decreased forage in a pasture infested with knapweeds and thistles.

After several years of implementing the 2008 Forest-wide Invasive Plant Control Project, Forest Plan Forest-wide standards and guidelines for NNIP (Section 2.3.10 Forest Health and Disturbance Process, p. 28) seem more idealistic than realistic.

- G-1 emphasizes use of basic prevention measures, but is not clear on what these are, does not provide guidance on how to use them, or explain their value. This guideline would be more helpful if it referred the reader to the Best Management Practices (BMP) for the Eastern Region (available online at https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5412822.pdf) and recommended implementing the BMP most appropriate for the specific activities undertaken. It is also recommended that training be developed for all field-going staff, and that the Forest Leadership Team develop and communicate expectations regarding prevention measures. In

addition, it is recommended that each district have the ability to clean machinery in the field, including between sites.

- G-2 directs management to attempt to determine the source of infestation before treatment begins. While that is sage advice (its goal is to prevent immediate reinfestation of a site after it is treated), it is often not feasible on FLNF, where most sites are infested. It is recommended that the wording be changed to “To increase the likelihood of treatment success, if the source of an infestation can be identified, attempt to address it prior to treating the infestation”.
- G-2 encourages restoration, but does not define what that is, or how to go about developing restoration plans. It is recommended that the wording be changed to “Include restoration, rehabilitation, or revegetation, as defined by Forest Service Manual 2070”.
- G-2 also directs management to use herbicides only when other methods are ineffective, but monitoring has identified that the most suitable method is often very species-specific and is also influenced by time and budget. It is recommended that the wording be changed to “use the method most likely to be effective given the species, infestation characteristics, and available resources”.
- G-3 suggests prioritization of treatment actions, but that prioritization does not align with what is feasible on the ground. Realistically, the choice of treatments is based on the sources of funding available, the availability of staff to identify and carry out priorities, and the need to focus on response to proposed ground-disturbing projects. It is recommended the first two bullets remain the same (prevention and early detection rapid response) and that the remaining four bullets be combined into one that encompasses containing and controlling established infestations.
- G-5 encourages use of weed-free forage, but there is no system in place for enforcing this guideline. Since the primary people who would bring forage onto National Forest land are the Hector Grazing Association permittees, it is recommended that a clear policy be established and enforced, with penalties for non-compliance.

Lands

Evaluation Question: Land Ownership Adjustment

Monitoring Question: To what extent have Forest Plan Objectives been attained?

Detailed Monitoring Question: To what extent has the FLNF land base been adjusted through purchase, exchange, transfer, interchange, boundary adjustment and donation?

Monitoring Activities Conservation partners, state and local colleagues, and interested citizens have provided tremendous assistance in identifying lands from willing sellers that would benefit the National Forest System. Land adjustment activities are recorded in the Landownership Adjustment Data System (LADS), including the acquisition of parcels, the donation of parcels to the federal government, the exchange of land, and the conveyance of land. The LADS system recorded no land adjustment activities on FLNF during fiscal years 2014 to 2016.

Evaluation and Conclusions: The information and collaboration gained from partners and the willingness of local participation continues to highlight the importance of partnerships and community involvement in adjusting FLNF land base.

Recommendations: Continue to work with partners, state entities and communities to help identify, evaluate, and subsequently acquire properties and secure rights of ways to accomplish land adjustment goals.

Evaluation Question: Special Uses - Lands

Monitoring Question: To what extent have Forest Plan Objectives been attained?

Detailed Monitoring Question: Is the Forest improving its administration of existing authorizations?

Monitoring Activities: Data for special use permits is consolidated for the Green Mountain (Vermont) and Finger Lakes (NY) National Forests and is found in the Special Uses Database System (SUDS). Information for this report was obtained by pulling the fiscal year-end Administered to Standard report. SUDS contains six elements that can feed into determining if a permit is administered to standard: is the authorization current, are fees calculated, has a bill been issued, is insurance current, has the permit area been inspected on the appropriate schedule, and have performance evaluations been conducted on the appropriate schedule (Table 2-5).

Table 2-5. Special use permit authorization and Administered to Standard Report for Green Mountain and Finger Lakes National Forests from fiscal years 2014 to 2016.

	Fiscal Year 2014	Fiscal Year 2015	Fiscal Year 2016
Total Recreation Authorizations	64	41	42
Recreation Authorizations to Standard	30	29	34
Percent Recreation to Standard	47%	71%	81%
Total Lands Authorizations	111	110	105
Lands Authorizations to Standard	58	53	53
Percent Lands to Standard	52%	48%	50%

Evaluation & Conclusions: The Forest is improving the administration of existing authorizations.

Recommendations: More dedicated staff is needed to continue improving the administration of special use authorizations.

Program Management

Evaluation Question: Desired Future Condition

Monitoring Question: What are the effects of management practices prescribed by the 2006 Forest Plan?

Detailed Monitoring Question: What activities have occurred in management areas? How have these management actions helped to achieve the desired future condition of the management area? Have activities occurred that detract from the desired future condition of the management area?

Monitoring Activities: The total number of projects approved in fiscal years 2014 to 2016 to implement the Forest Plan is provided in Table 2-6 by the level of analysis required by the National Environmental Policy Act (NEPA). Table 2-7 shows the list of projects approved for each fiscal year.

Table 2-6. Number of projects approved for implementation in fiscal years 2014 to 2016.

National Environmental Policy Act – Level of Analysis	Fiscal Year 2014	Fiscal Year 2015	Fiscal Year 2016
Record of Decision (EIS – Environmental Impact Statement)	0	0	0
Decision Notice (EA – Environmental Assessment)	0	0	0
Decision Memo (CE – Categorical Exclusion)	5	4	2
Letter to the File (CE – Categorical Exclusion)	0	1	0

National Environmental Policy Act – Level of Analysis	Fiscal Year 2014	Fiscal Year 2015	Fiscal Year 2016
Supplemental Information Report	1	0	0
Total Projects Approved	6	5	2

Table 2-7. List of projects approved for implementation in fiscal years 2014 to 2016.

Project Name (alphabetical order)	NEPA Level ¹	Fiscal Year Approved	Project Description
Backbone Horse Camp Trough	DM	2014	Dredge the existing pond and install pipe to feed new water hydrant in the developed campground.
Blueberry Patch Wetland Restoration	DM	2016	Restore wetlands in Blueberry Patch Swamp area.
Breakneck Brook Large Wood Debris (LWD) Restoration	DM	2014	Placement of LWD in a 1-mile stretch of Breakneck Brook.
Finger Lakes Runner's Club Special Use Reissuance	DM	2015	Reissuance of 5-year permit to authorize Forest-wide running event.
Hemlock Woolly Adelgid Suppression	DM	2015	Suppress HWA infestations across the forest landscape with biological/chemical treatments using new CE Farm Bill authority.
Invasive Plant Control (IPC) SIR	SIR	2014	Review Finger Lakes Invasive Plant Control EA/DN for new glyphosate risk assessment, use of imazapyr, use of imazapyr/glyphosate mixture, and to consider control efforts on non-NFS lands where Forest Service funding is used.
North Hill Culvert Installation	LTF	2015	Install culvert along "qualified abandoned" town road to address soil & water impacts.
Peterson Pasture Hedge Row Removal	DM	2014	Obliterate hedgerow and convert to pasture.
Smith Pond Dry Hydrant	DM	2014	Dry hydrant placement into Smith Road pond.
Springer Spaniel Field Trial SUP	DM	2015	Issue permit for one-time event to conduct the 2015 English Springer Spaniels National Amateur Championship on grassland for wildlife and grazing pastures.
Teeter and Foster Ponds Repair	DM	2016	Repair or replace water control structures at Teeter and Foster ponds.
Wetland Creation and Restoration	DM	2014	Creation and/or restoration of wetlands in grasslands for wildlife. Combined A-House West and Potomac North Wetland Creation projects, and Terry Berry Wetland Restoration project.
Youth Pioneer Event SUP	DM	2015	Issue permit for Mormon youth to reenact church historical walk west on trails and roads.

¹ DM = Categorical Exclusion – Decision Memo; LTF = Categorical Exclusion – Letter to the File; SIR = Supplemental Information Report.

Evaluation and Conclusions: There were a total of 12 projects approved for Forest Plan implementation during fiscal years 2014 to 2016. In addition, there was one project reviewed with a supplemental information report to determine whether changed conditions warranted a new decision. Although approved during this monitoring period, some are ongoing and are anticipated to be completed in outyears. All projects were designed and found to be consistent with Forest Plan direction including goals, objectives, and forest-wide and management area standards and guidelines. Collectively, these projects have moved existing conditions toward desired future conditions according to each management area direction where they are located.

Recommendations: Continue management activities that improve the desired future condition for all management areas and are designed to reach plan objectives. Look for opportunities to increase Forest Plan implementation in all management areas. Continue to monitor progress in reaching desired future conditions.

Evaluation Question: Outputs Accomplished - Other Resources

Monitoring Question: How close are actual outputs and services to projected outputs and services?

Detailed Monitoring Question: How do actual outputs compare to those projected in Forest Plan Appendix D, Proposed and Probable Practices, specifically related to heritage, recreation, roads, vegetation, rare, ecological, wildlife, and fisheries resources?

Monitoring Activities: Table 2-8 shows the outputs and services provided on FLNF during fiscal years 2014 to 2016.

Evaluation and Conclusions: Most resource outputs and services are moving toward estimated total amounts for the first decade of Forest Plan implementation (2006 to 2015).

Table 2-8. Estimated and actual outputs achieved in fiscal years 2014 to 2016 (Forest Plan Appendix D, Proposed and Probable Practices).

Activity or Practice	Unit of Measure	Estimated Amount (Decade 1) ¹	Actual Amount Achieved: Fiscal Year 2014	Actual Amount Achieved: Fiscal Year 2015	Actual Amount Achieved: Fiscal Year 2016
Recreation Resources					
Trail Improvement	Miles	3-6	1	2	1
Trail Maintenance – to standard	Miles	50-200	5	5	5
Trail Rehabilitation	Miles	20-40	0	3	2
Trail Maintenance – total system	Miles	380	36.61	35	36
Vegetation					
Site Preparation/ Reforestation	Acres	250	0	0	0
Stand Improvement	Acres	80-120	0	0	0
Thinning Harvest	Acres	250-300	0	0	0
Shelterwood Regeneration	Acres	100-150	0	0	0
Shelterwood Removal	Acres	50-100	0	0	0
Selection Harvest	Acres	325-375	0	0	0
Clearcut	Acres	30-50	0	0	0
Wildlife, Fisheries, Rare Plant, Rare or Outstanding Natural Community Resources					
Shrub Opening Maintenance	Acres	1,000-1,500	48.6	10	87.25
Wildlife Pond Maintenance	Ponds	6	0	0	0
Pasture Maintenance					
Mowing	Acres	7,500-10,000	1,284	1,492	1,400
Liming	Acres	500-1,000	0	0	0

Activity or Practice	Unit of Measure	Estimated Amount (Decade 1) ¹	Actual Amount Achieved: Fiscal Year 2014	Actual Amount Achieved: Fiscal Year 2015	Actual Amount Achieved: Fiscal Year 2016
New Fencing	Miles	4-6	0	.12	0
Reconstruct Fence	Miles	20-30	0.5	1.4	1.7
New Stock Pond	Ponds	3	0	0	0
Facilities	Facilities	5	2	3	1
Total Forage Production	Animal Unit Month	108,500	8,131	7,137	8,393
Non-Commercial Clearcutting of Aspen	Acres	80	0	0	10
Monitor condition of sites and species under special forest product permits	Sites	All	Not available	Not available	0
Inventory for TES species and rare or outstanding natural communities	Acres	1,600	285.2 – plants; 2,019 grassland birds RFSS	444.7- plants; 1,533-grassland birds RFSS	712.7 – plants; 1,775 grassland birds RFSS
Monitor known rare or outstanding ecological, biological, or geological features, including TES occurrences	Sites	All	16 sites for RFSS plants	9 sites for RFSS plants	2 sites for RFSS plants
Prepare conservation plans for each rare or outstanding area	Sites	7	0	0	0
Establish RNAs	Sites	2	0	0	0
Protect known occurrences of TES species	Sites	All	All TES species protected during project implementation	All TES species protected during project implementation	All TES species protected during project implementation
Protect, and where feasible, improve or restore habitat conditions for TES species	Sites	All	10 grasslands for RFSS plants Wildlife- all sites protected during project implementation	8 grasslands & 6 riparian areas for RFSS plants Wildlife- all sites protected during project implementation	10 grasslands & 1 wetland creation site for RFSS plants Wildlife- all sites protected during project implementation
Protect important habitat sites for TES bats	Roost and den trees	Adequate numbers of roost and den trees	TES bats are not limited by available summer habitat. Known maternity roost areas are protected during project review/ implementation	TES bats are not limited by available summer habitat. Known maternity roost areas are protected during project review/ implementation	TES bats are not limited by available summer habitat. Known maternity roost areas are protected during project review/ implementation
Update conservation assessments for RFSS	Species	All	0	0	0
Fish Stocking	Ponds	6	3		
Fish Surveys	Surveys	3	Not available	2	3

Activity or Practice	Unit of Measure	Estimated Amount (Decade 1) ¹	Actual Amount Achieved: Fiscal Year 2014	Actual Amount Achieved: Fiscal Year 2015	Actual Amount Achieved: Fiscal Year 2016
Heritage Resource Protection Acres Surveyed	Acres	250-750	Not available	Not available	800
Agreements w/County Law	Agreements	2	0	0	0
NF land signs placed and/or maintained	Signs	20-30	Not available	Not available	Not available

¹ These numbers represent the sum of annual activities in years 1 through 10 (2006 to 2015).

Recommendations: Continue to monitor outputs and services to determine if there are shortcomings in services provided and/or if adjustments should be made to the estimated outputs due to budget constraints or a change in the need to produce these outputs. Review total outputs for the fiscal years 2006 to 2015 monitoring period to determine if changes are needed for estimated outputs during the second decade of Forest Plan implementation (2016 to 2025).

Evaluation Question: Costs of Plan Implementation

Monitoring Question: How close are actual costs to projected costs?

Detailed Monitoring Question: To what extent is the Forest Service providing a mix of products, services, and amenities?

Monitoring Activities: The cost of implementing the 2006 Forest Plan is based on current budgets for all program areas excluding timber outputs. The Forest Service at the Washington and Regional levels track some outputs related to Forest Plan implementation, otherwise known as targets, on a yearly basis. Cost of providing these outputs is estimated through FLNF program work plans. Table 2-9 displays the targets that were achieved on the Green Mountain and Finger Lakes National Forests in fiscal years 2014, 2015, and 2016, and the estimated cost for achieving that target. Information is presented as a collective report for both National Forests because the information is tracked regionally in a combined report.

Table 2-9. Fiscal years 2014 to 2016 target accomplishments and estimated cost.

Target Activity	Amount Accomplished Fiscal Year 2014	Estimated Cost Fiscal Year 2014	Amount Accomplished Fiscal Year 2015	Estimated Cost Fiscal Year 2015	Amount Accomplished Fiscal Year 2016	Estimated Cost Fiscal Year 2016
Inventory and Monitoring						
Annual monitoring requirements completed	All items	Not available	All items	Not available	All items	Not available
Inventory data collected or acquired to standard	All items	Not available	All items	Not available	All items	Not available
Forest Planning						
Amendments Underway	0	\$0	0	\$0	0	\$0
Facilities						
Forest administrative and other facilities maintained to standard	21 facilities	\$ 26,987	21 facilities	\$ 535,902	19 facilities	\$138,184

Target Activity	Amount Accomplished Fiscal Year 2014	Estimated Cost Fiscal Year 2014	Amount Accomplished Fiscal Year 2015	Estimated Cost Fiscal Year 2015	Amount Accomplished Fiscal Year 2016	Estimated Cost Fiscal Year 2016
Recreation sites managed to standard	112 sites	\$146,225	118 sites	\$ 150,345	118 sites	\$ 152,170
Hazardous Fuels						
Treated with prescribed fire to reduce the risk of catastrophic wildland fire	628 acres	\$67,196	780 acres	\$ 83,430	636 acres	\$ 68,052
Lands						
Land acquisitions/ adjustments	0 acres	\$0	144.23 acres	\$741,000	378.84 acres	\$295,000
Boundaries marked	16.7 miles	\$ 192,067	15.1 miles	\$ 228,864	14.9 miles	\$ 149,921
Non-Recreation special use permits administered to standard	68 permits	\$ 93,075	62 permits	\$ 59,800	63 permits	\$ 88,581
Non-Recreation special use applications processed	10 applications	\$ 21,965	18 applications	\$ 56,075	8 applications	\$ 65,000
Rights of way acquired	0	\$0	0	\$0	0	\$0
Vegetation and Watershed						
Forest vegetation established	107 acres	\$ 21,400	700 acres	\$ 140,000	309 acres	\$ 61,800
Timber stand & genetic tree improvement	118 acres	\$ 23,600	98 acres	\$19,600	101 acres	\$ 20,200
Treated annually for noxious weeds and invasive plants	1180.2 acres	\$ 107,615.07	1130.6 acres	\$ 68,267.26	659.9 acres	\$ 195,834.04
Range land vegetation improved	746 acres	\$ 30,093	1039 acres	\$ 32,209	1077 acres	\$ 31,771
Soil and Water resource acres improved	1,508 acres (soil & water resources improved acres were not reported specifically in FY14, values represent affected zones from projects that would improve soil & water resource functioning)	\$ 185,399 (reported cost was retrieved from WIT & includes rough estimates & cost place holders that likely do not accurately reflect actual Forest expenditures for these projects)	1,113 acres	\$ 150,065 (reported cost was retrieved from WIT & includes rough estimates & cost place holders that likely do not accurately reflect actual Forest expenditures for these projects)	160 acres	\$ 47,856 (reported cost was retrieved from WIT & includes rough estimates & cost place holders that likely do not accurately reflect actual Forest expenditures for these projects)

Finger Lakes National Forest

Target Activity	Amount Accomplished Fiscal Year 2014	Estimated Cost Fiscal Year 2014	Amount Accomplished Fiscal Year 2015	Estimated Cost Fiscal Year 2015	Amount Accomplished Fiscal Year 2016	Estimated Cost Fiscal Year 2016
Wildlife, Fish and Threatened, Endangered and Sensitive Species						
Lake habitats restored or enhanced	275 acres	\$ 11,350	188.2 acres	\$82,991	224.9 acres	\$9,028
Stream habitats restored or enhanced	43.37 miles	\$432,150	36.76 miles	\$1,383,515	79.32 miles	\$297,899
Terrestrial habitats restored or enhanced	5,263.6 acres	\$272,412	5,858.85 acres	\$253,356	4,479.66 acres	\$489,521
Range						
Grazing allotments managed to 100% standard	4,911 acres	\$ 52,466	4,911 acres	\$ 66,080	4,911 acres	\$ 65,900
Recreation						
Heritage assets managed to standard	Not available	Not available	Not available	Not available	Not available	Not available
Recreation site capacity operated to Standard	872,445 PAOT days	\$146,225	917,780 PAOT days	\$ 150,345	917,780 PAOT days	\$ 152,170
Number of interpretive and conservation education plans implemented	1 plan	\$60,000	1 plan	\$ 60,000	1 plan	\$60,000
Recreation special use authorizations administered to standard	32 permits	\$17,925	32 permits	\$ 5,093	38 permits	\$2,918
Recreation Special use applications processed	30 applications	Not Reported	11 applications	Not Reported	16 applications	Not Reported
Trails improved to standard	3 miles	\$108,210	3 miles	\$53,471	2 miles	\$49,764
Trails maintained to standard	211.3 miles	\$178,014	479.4 miles	\$196,889	471.7 miles	\$232,869
Wilderness Areas managed to standard	8 areas	\$131,018	0 areas	\$92,856	0 areas	\$81,897
Roads						
Roads decommissioned	0 miles	\$181,089	2.6 miles	\$503,467	0 miles	\$387,500
High clearance roads maintained	16.6 miles		12.8 miles		22.61 miles	
Passenger car roads improved	0.2 miles		0.1 miles		1.0 miles	
Passenger car roads maintained	66.7 miles		64.13miles		62.1 miles	
Lands covered by motor vehicle use map (MVUM) – includes development of the GM MVUM	408,972 acres	Not available	408,972 acres	Not available	408,972 acres	Not available

Target Activity	Amount Accomplished Fiscal Year 2014	Estimated Cost Fiscal Year 2014	Amount Accomplished Fiscal Year 2015	Estimated Cost Fiscal Year 2015	Amount Accomplished Fiscal Year 2016	Estimated Cost Fiscal Year 2016
Timber						
Timber volume sold	9,579 ccf	\$879,000	8,246 ccf	\$ 901,000	10,079 ccf	\$ 1,023,000

Evaluation and Conclusions: Tracking costs of Forest Plan implementation activities provides program managers unit cost information that is helpful in the development of work plans and out-year planning. Over an extended period, tracking these costs can be used to develop management activity unit cost trend information enabling managers to make more informed decisions about the costs of management activities.

Recommendations: Continue to track Forest Plan implementation accomplishments and estimated costs to develop trend information that can improve efficiency and effectiveness.

Range

Evaluation Question: Watering Facilities

Monitoring Question: To what extent have objectives been attained?

Detailed Monitoring Question: Are we providing functioning livestock watering facilities to support approximately 10,000 Animal Unit Months (AUMs) annually?

Monitoring Activities: Forest Service rangeland staff and Hector Cooperative Grazing Association (HGA) annually inspect all existing watering facilities to assess maintenance and adequacy of systems. HGA provided maintenance activities throughout fiscal years 2014 to 2016 including valve and cement trough repair in some pastures. In fiscal year 2015, HGA also built new riparian fencing around the pond in Shannon pasture to exclude livestock. New troughs were installed and ponds were fenced out in Hawes and Woodard pastures, providing a controlled water source. There were 8,131, 7,137, and 8,393 AUMs supported with functioning watering facilities in fiscal years 2014, 2015, and 2016, respectively. Watering facilities are adequate to support at least 10,000 AUMs; however, for this monitoring period there were fewer animals on pastures than permitted to graze because of a lower demand by area farmers.

Evaluation and Conclusions: Of the 44 human-made ponds across FLNF providing water to livestock, reviews throughout this monitoring period indicate that although all were functioning, several require dredging to remove sediment and to repair earthen dams damaged from nearly 40 years of natural, rodent (i.e. beaver and muskrat), and livestock-caused bank erosion. Cattle exclusion fencing was found to be in disrepair on a few ponds, allowing for total cattle access. Additional ponds identified in the 2009 Grazing Allotment Management Plan Decision Memo authorizing grazing unit maintenance will continue to be prioritized for repair as funding allows. Also, repair and replacement of pipeline and trough fixtures will continue to ensure livestock watering needs are met.

Recommendations: The HGA are encouraged to seek innovative alternatives to fund watering facility maintenance needs. HGA routinely provides maintenance and monitoring of watering areas, but additional new fencing to enhance water quality and riparian protection in pastures for wildlife and livestock will result in increased costs. Monitoring and watering facility improvements are expected to continue in fiscal year 2017 and beyond to ensure livestock facilities are providing sufficient water. Forest Service will also continue to use appropriated funds to improve watering facilities on National Forest System lands.

Evaluation Question: Animal Unit Months

Monitoring Question: To what extent have objectives been attained?

Detailed Monitoring Question: Are we maintaining forage production sufficient to support approximately 10,000 animal use months annually?

Monitoring Activities: Monitoring activities were not conducted in fiscal year 2014 due to continued staff vacancies. Up to 30 samples per pasture were collected in fiscal year 2015, measuring cool season grasses and forbs and undesirable vegetation. The sampling scheme divides all 39 pastures into six forage productivity classes. Samples are taken from one pasture of each representative soil type within each class. Clippings of each forage type (grasses, legumes and undesirables) are collected and dried to determine a green weight to dry weight conversion factor. Monitoring activities were completed via contract utilizing the same protocols and pasture units as were used in previous monitoring years.

Evaluation and Conclusions: Although the early mowing of goldenrod and herbicide treatments for non-native invasive plants successfully reduced targeted vegetation fiscal years 2014 to 2016, repeated herbicide treatments are needed for knapweed and thistles to reduce the surviving seed bank within the soil. Continued treatments and monitoring are planned to assess the effectiveness of this ongoing treatment intended to enhance forage quality and grassland habitat conditions. Forage biomass continues to rise in average across the years with data indicating pastures are producing adequate forage to support current grazing numbers.

Goldenrod and non-native invasive species continue to pose management challenges to long-term livestock grazing and forage production, especially in areas not recently mowed or sprayed. Control activities approved in the 2008 Forest-wide Invasive Plant Control Decision Notice guide the efforts to improve forage and wildlife habitat within grasslands. The use of herbicides, experimental sheep grazing, rotational grazing with cows, biological controls (i.e. release of approved insects), and earlier mowing for goldenrod are expected to continue contributing toward long-term enhancement of forage quality in pastures. These activities should continue in additional pastures with high infestations where spraying and mowing were not recently implemented.

Recommendations: No changes to the monitoring question are recommended.

Rare Plants Population

Evaluation Question: Regional Forester Sensitive Species (RFSS) Plant Population Trends

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

Detailed Monitoring Question: What are the population trends for sensitive plants on the FLNF? To what extent is management sustaining or enhancing habitat conditions for populations?

Monitoring Activities: The RFSS list was updated in 2012 to include 20 plant species (see Appendix B, Table B-2). Monitoring data collected for each rare plant population is stored in NRIS TESP-IS, the Forest Service corporate database. This botanical data includes: 1) number of ramets or genets, 2) percent reproductive, 3) spatial extent of population, 4) number of populations of a species, and 5) ranked condition of populations. At times the available taxa list in NRIS does not keep up with species tracked, so additional data is stored in a FLNF level spatial layer, called "Rare Plants not in NRIS". Monitoring trends for each species are summarized in Appendix B, Table B-3.

In addition to monitoring known populations of RFSS, annual botanical inventory is undertaken to search for new populations, either in response to a proposed ground-disturbing project, or to learn more about habitats the Forest Service is responsible for managing.

Botanical inventory for rare plants and non-native invasive plants occurred in the following locations during the fiscal years 2014 to 2016 monitoring period:

Fiscal Year 2014 (285.2 acres)

- Late growing season inventory at Caywood Point Recreation and Education Special Area (215 acres); 29 non-RFSS plants found that are rare or scarce in the Cayuga Lake Basin, and will be evaluated for listing as RFSS during the next list update scheduled for fiscal year 2017
- Late growing season botanical inventory of all 86 ponds (70 acres) on FLNF
- 16 of 20 RFSS plants (58+ populations) monitored

Fiscal Year 2015 (444.7 acres)

Early growing season inventory at Caywood Point Recreation and Education Special Area (215 acres)

- Early growing season botanical inventory of all 86 ponds (70 acres) on FLNF
- Shannon grassland for grazing (159.5 acres)
- 9 of 20 RFSS plants monitored

Fiscal Year 2016 (712.7 acres)

- Stands proposed for harvest as part of the Finger Lakes Invasive Pest Strategy (FLIPS) project
- 2 of 20 RFSS plants monitored

Evaluation and Conclusions: Forest Plan Goal 2 directs management to “maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals” (Forest Plan, p. 10). Forest Plan Forest-wide Standards and Guidelines for Rare and Unique Biological Features (Forest Plan, p. 26) require management to maintain a list of all threatened, endangered and sensitive (TES) species (Standard S-1) and investigate all project sites for TES species (Standard S-2). Management activities complied with Forest Plan direction by having rare plant and inventories completed at Caywood Point, at all FLNF ponds, in grasslands where active rangeland management occurs, and in the stands proposed for harvest as part of the Finger Lakes Invasive Pest Strategy (FLIPS) project. Management activities have also complied with Forest Plan direction by monitoring known rare plant occurrences on a cyclical basis. Past monitoring aimed for a five-year cycle, but as the botany program of work has increased, this has changed to a seven-year cycle.

Finally, broadcast and spot herbicide treatments of NNIP in grasslands and at Caywood Point benefited RFSS and other rare plants that occur there, and will be evaluated for the next RFSS list update anticipated in fiscal year 2017. Acres of NNIP treatments are provided in the Non-native Invasive Species monitoring item section.

After three years of monitoring activities for the 20 plant species on the RFSS list, trends are unknown for five, are variable and uncertain for one, and stable for the remaining 14. Butternut trees (*Juglans cinerea*), one of the RFSS for which trends are unknown, has many occurrences on FLNF and is known to be dying from the butternut canker; there is little action the Forest Service can take to prevent the impacts of that disease. Canada lily (*Lilium canadense*), another RFSS for which trends are unknown, may either be declining, or may simply be temporary wherever it occurs: small populations are discovered and then quickly dwindle or disappear. Two other species for which trends are unknown, bottle gentian (*Gentiana clausa*) and Copenhagen hawthorn (*Crataegus boyntonii*) have not been monitored. Yellow wild-indigo (*Baptisia tinctoria*), the fifth species for which trends are unknown, was only found in one place on FLNF, and has not been found in recent years; it may truly be missing. Blunt-lobed grapefern

(*Botrychium oneidense*) for which trends are uncertain, is very vulnerable due to tiny populations, but is assumed to be stable.

Recommendations: Species-specific recommendations are provided in Appendix B, Table B-3. The biggest challenges are: 1) extensive infestations of NNIP in most habitats that could eventually limit the ability of some RFSS to persist due to competition; 2) limited funds to treat NNIP as many times as needed to be successful; and 3) small botany staff spread too thin to monitor as frequently as desired. There is an ongoing need to cultivate partnerships with local volunteers, including The Finger Lakes Native Plant Society and Cornell University or other colleges, who might be able to support the monitoring program.

Forest Plan Forest-wide standards and guidelines for NNIP (Forest Plan, Section 2.3.10, p. 28), Guideline G-1 emphasizes use of basic prevention measures. If this guideline were better implemented, it might be possible to reduce the potential effect of NNIP on RFSS. It is recommended training be developed for all field-going staff, and that Forest Leadership Team develop and communicate expectations regarding prevention measures. In addition, it is recommended that each district be able to clean machinery in the field, including between sites. No other changes are needed to the Forest Plan or the monitoring question or methodology.

Recreation

Evaluation Question: Recreation Visitor Satisfaction

Monitoring Question: To what extent have objectives been attained?

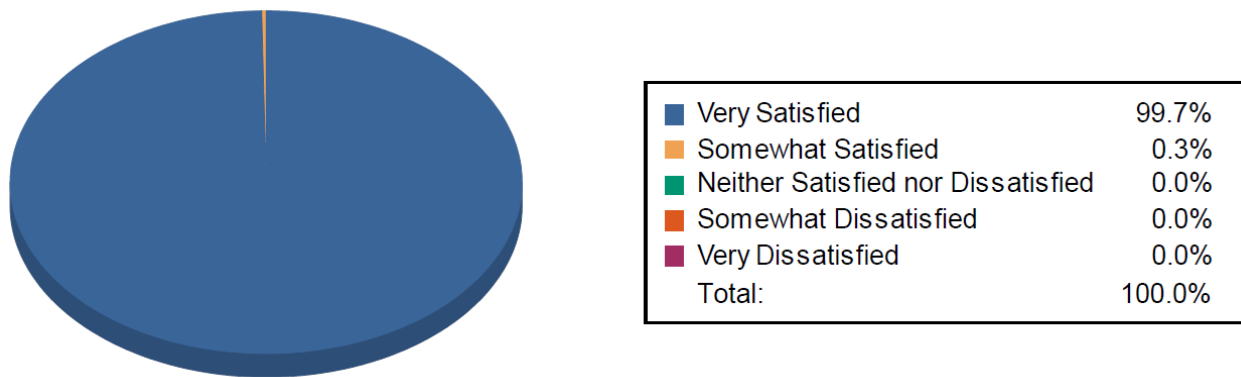
Detailed Monitoring Question: Are we providing high quality recreation services that meet the expectations of the public?

Monitoring Activities: The National Visitor Use Monitoring (NVUM) program provides reliable information about recreation visits to national forest system managed lands at the national, regional, and forest level. The NVUM program has two concurrent goals. First, to produce estimates of the volume of recreation visitation to National Forests and Grasslands. Second, to produce descriptive information about that visitation, including activity participation, demographics, visit duration, measures of satisfaction, and trip spending connected to the visit. Specific NVUM protocols, terminology, limitations, data, annual reports, and other information is available at: <https://www.fs.usda.gov/about-agency/nvum/>

The NVUM data is collected and reported on a five-year cycle. To assess visitor satisfaction, recreation visitors were asked through the NVUM program to provide an overall rating of their visit to the national forest, on a 5-point Likert scale, ranging from not important to very important. Visitors rated both the importance and performance (satisfaction with) of these elements.

Evaluation and Conclusions: Based on 2015 NVUM data, an overwhelming majority of visitors (99.7 percent) to FLNF report they are “very satisfied” with their overall National Forest experience (Figure 2-1) (USDA Forest Service, 2018 a, b and c).

Figure 2-1. Percent of National Forest Visits by Overall Satisfaction Rating.



In respect to providing high-quality recreation services, NVUM monitoring looks at the satisfaction elements most readily controlled by managers. These are aggregated into four categories: developed facilities, access, services, and visitor safety and the site types sampled are aggregated into two groups: developed sites (including both day use and overnight developed sites) and dispersed areas. The “Percent Satisfied Index (PSI)” identifies the proportion (percent) of elements and sites with a numerical rating of 4 or 5, equivalent to the percent of all recreation customers who are satisfied with agency performance. The agency’s national target for this measure is 85 percent. Table 2-10 displays the aggregate PSI scores for FLNF.

Developed recreation sites met user expectations to a very high degree for developed facilities (88 percent), access (88.5 percent) and the feeling of safety (100 percent); however, visitors to undeveloped areas are less satisfied with available services (70.3 percent). Visitors to undeveloped areas had expectations met for developed facilities (100 percent), access (88.3 percent) and the feeling of safety (100 percent); however, visitor satisfaction dropped below the agency’s national target of 85 percent to 43.2 percent for services in undeveloped areas on FLNF (USDA Forest Service, 2018 a, b and c).

Table 2-10. Percent Satisfied Index¹ scores for aggregate categories.

Satisfaction Element	Satisfied Survey Respondents (percent)	
	Developed Sites ²	Undeveloped Areas
Developed Facilities	88.0	100.0
Access	88.5	88.3
Services	70.3	43.2
Feeling of Safety	100.0	100.0

¹ This is a composite rating. It is the proportion of satisfaction ratings scored by visitors as good (4) or very good (5). Computed as the percentage of all ratings for the elements within the sub-grouping that are at or above the target level and indicates the percentage of all visitors that are reasonably well satisfied with agency performance.

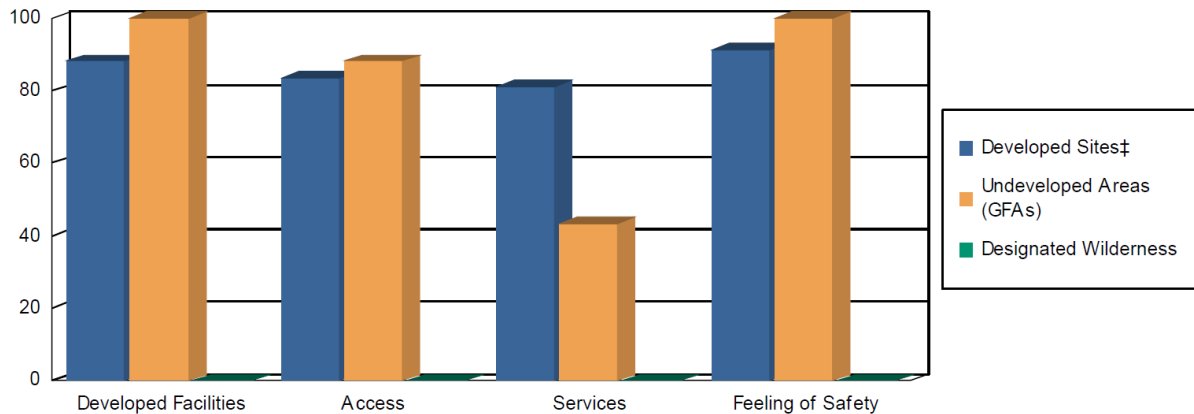
² This category includes both Day Use and Overnight Use Developed Sites.

The NVUM results also identify the proportion of satisfaction ratings in which the numerical satisfaction rating for a particular element is equal to or greater than the importance rating for that element, known as the “Percent Meet Expectations (PME).” This indicator tracks the congruence between the agency’s performance and customer evaluations of importance. The idea behind this measure is that those elements with higher importance levels must have higher performance levels. Lower scores indicate a gap between desires and performance. Figure 2-2 shows all scores rated above 80 percent suggesting there is no significant gap between public desires and agency performance, with the exception of services provided in undeveloped areas (below 50 percent); the FLNF has no Congressionally-designated Wilderness so

those scores do not apply. Additional details from the NVUM results indicate that PME scores would increase if efforts focused on improving trail conditions.

Figure 2-2. Percent Meets Expectations Scores.

‡ This category includes both Day Use and Overnight Use Developed Sites.



Recommendations: No significant changes to recreation management and maintenance should be taken based on monitoring results; however, opportunities to improve trail conditions should be considered to narrow the gap between public desires and agency performance. Forest Service recreation staff should continue to use NVUM data collection to help inform future decisions in addition to assessing and implementing site-specific improvement plans and maintenance to improve visitor satisfaction.

Evaluation Question: Recreation Visitor Satisfaction

Monitoring Question: To what extent have objectives been attained?

Detailed Monitoring Questions: Is the Forest providing recreation equity to serve diverse publics? Is there disproportionate utilization of recreation resources by demographic?

Monitoring Activities: This monitoring question compares data from the USDA Forest Service National Visitor Use Monitoring program conducted on the Green Mountain and Finger Lakes (GMFL) National Forests to 2010 US Census data in order to examine whether there is disproportionate utilization of recreation resources on NFS lands.

National forest visitation data for racial and ethnic minority and non-minority user groups was obtained from the NVUM program (USDA Forest Service 2018a, b and c). Visitor inventories are conducted on a five-year cycle; the most recent datasets from 2005, 2010 and 2015 were utilized for this study. The NVUM data was then compared with 2010 demographic data obtained from the US Census Bureau (US Census Bureau 2010) for Massachusetts, New York, Vermont, and the United States. The difference between NVUM (percent Forest Visitor Minority) and US Census (percent Minority) was computed.

Evaluation and Conclusions: It is important to discuss a limitation associated with this analysis before discussing the results. The 2005 and 2010 NVUM results include data for the Green Mountain (VT) and Finger Lakes (NY) National Forests (GMFL) combined; the 2015 NVUM results are specific to FLNF only. In addition, the comparison between US Census and NVUM datasets considered Census populations from the national average as well as Census populations from the three states representing the majority of NVUM responders averaged from the 2005, 2010 and 2015 results: Massachusetts

(approximately 10 percent of responders); New York (approximately 10 percent of responders in 2005 and 2010; 90 percent of responders in 2015); and Vermont (approximately 50 percent of responders); however, national forest visitation estimates represent all visitors regardless of the distance they traveled.

Results suggest an inequity gap wherein racial minorities are not utilizing FLNF recreation opportunities at the same rate as their white counterparts (see Figure 2-3). The percent of NVUM responders reporting as Black/African American, Asian, and Hispanic/Latino are consistently below Census population percentages for Massachusetts, New York, Vermont and the United States with the exception of 2005. Hispanic/Latino NVUM responders exceeding the percentage of Vermont Census data (2.32 percent Hispanic/Latino NVUM responders and 2 percent Hispanic/Latino Vermont population by Census) (USDA Forest Service 2018a, b and c and US Census Bureau 2021). National Visitor Use Monitoring responders identifying as female gender also showed National Forest visitation estimation percentages below Census data (see Table 2-11).

Table 2-11. National Visitor Use Monitoring (NVUM) percent visitation by reported gender in comparison to 2010 U.S. Census Bureau data from the national average as well as Census population data from the three states representing the majority of NVUM responders.

Gender	2005 GMFL ¹ NVUM	2010 GMFL ¹ NVUM	2015 FLNF ¹ NVUM	2010 Census: VT	2010 Census: NY	2010 Census: MA	2010 Census: US
Female	41.85%	38.94%	45.67%	50.60%	51.40%	51.50%	50.80%
Male	58.15%	61.06%	54.33%	49.40%	49.60%	49.50%	49.20%

¹ 2005 and 2010 NVUM results include data for the Green Mountain (VT) and Finger Lakes (NY) National Forests (GMFL) combined. The 2015 NVUM results are specific to FLNF only.

Figure 2-3. National Forest Visitor Demographic Comparison to U.S. Census Data.

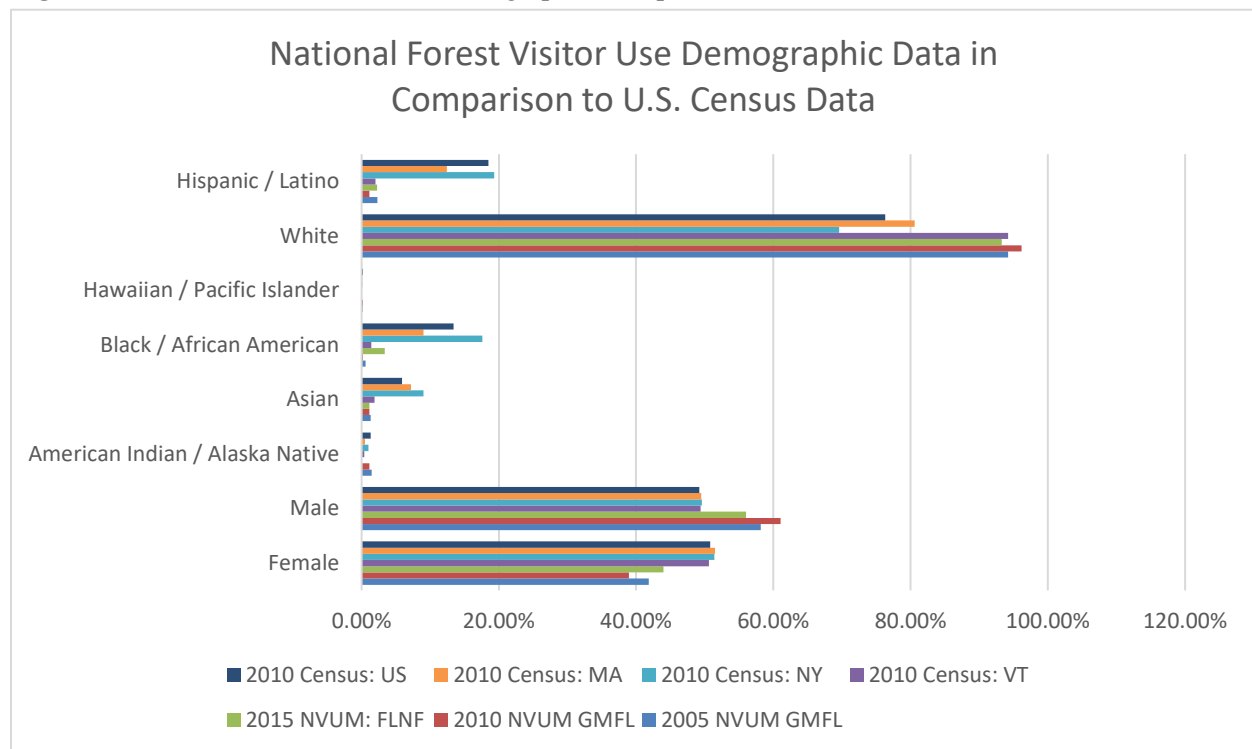


Figure 2.3 shows percentage of National Visitor Use Monitoring (NVUM) responders reporting by gender and race/ethnicity in comparison to US Census Bureau 2010 data population percentages for

Massachusetts, New York, Vermont, (three states representing the majority of NVUM responders), and the United States. NVUM responses are recorded by year and location: Green Mountain and Finger Lakes (GMFL) National Forest or FLNF only.

Recommendations: The results from this study suggest there is disproportionate utilization of forest recreation opportunities for many racial and ethnic minority groups, demonstrating the need for the Forest Service to identify and evaluate strategies that would enhance greater racial and ethnic inclusion in outdoor recreation. There is also a need to better refine measures to encourage diversity and inclusivity in local decision-making and planning processes to best serve all our publics and to sustain future relevance of the agency (Flores, et al 2018).

Evaluation Question: Trail Maintenance

Monitoring Question: Is the quality of the Forest Service trail system being improved through operation and maintenance?

Detailed Monitoring Question: Is the amount of deferred maintenance on the FLNF trail system being reduced?

Monitoring Activities: This monitoring question measures total deferred maintenance divided by total system trail miles for FLNF; however, information for fiscal years 2014 to 2016 was not generated to capture snapshots in time of the deferred maintenance and National Forest Trail System miles during these years.

Evaluation and Conclusions: Not available.

Recommendations: Ensure annual reports are generated to capture deferred maintenance and trail mileage data for future reporting efforts.

Evaluation Question: Recreation Facility Maintenance

Monitoring Question: To what extent have Objectives been attained?

Detailed Monitoring Question: Is the Forest reducing deferred maintenance on developed recreation facilities and sites? Is the Forest increasing the number of recreation facilities that are maintained to standard?

Monitoring Activities: This monitoring question measures percent recreation facilities managed to standard and trends; however, information for fiscal years 2014 to 2016 was not generated to capture snapshots in time of the deferred maintenance and the number of recreation facilities managed to standard during these years.

Evaluation & Conclusions: Not available.

Recommendations: Ensure annual reports are generated to capture deferred maintenance on developed recreation facilities and the number of recreation facilities managed to standard for future reporting efforts and trend data.

Evaluation Question: Trends in Trail Partnerships

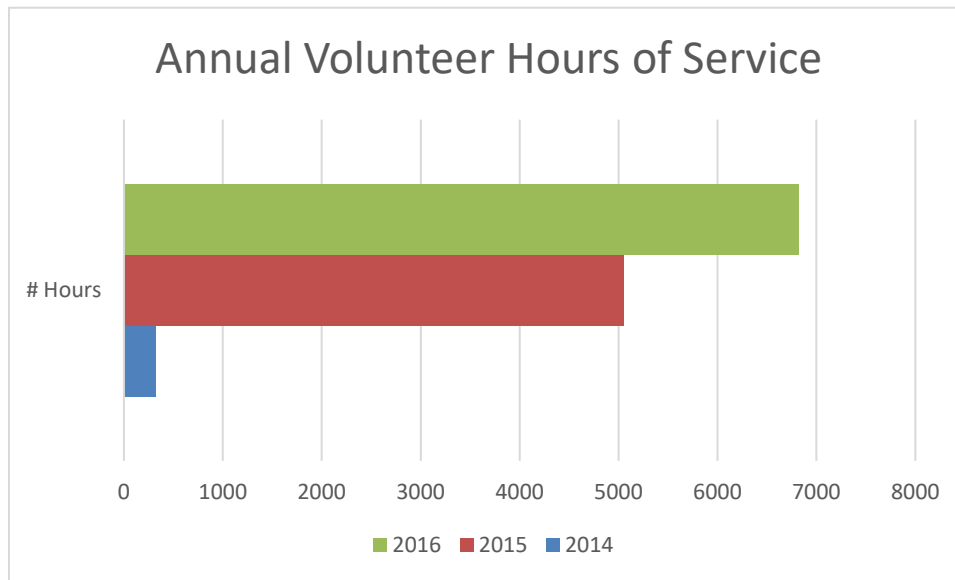
Monitoring Question: To what extent have Objectives been attained?

Detailed Monitoring Question: How well is the Forest using partnerships to assist in the operations and maintenance of the Forest trail system?

Monitoring Activities: Forest Service staff and partners collect volunteer data annually, including demographic figures, total volunteer numbers, hourly contributions, and more. This data is compiled and reported nationally through the Volunteer & Services Reporting system for both individual and group volunteers on the Green Mountain and Finger Lakes (GMFL) National Forests as a combined report.

Evaluation and Conclusions: Figure 2-4 depicts annual volunteer contributions (total hours) over the fiscal years 2014 to 2016 monitoring period in both Vermont and New York. Annual volunteer contributions rose sharply from 320 total hours in 2014 to 6,821 hours in 2016. The reason for this trend is unclear but could be the result of increased Forest Service partner/volunteer engagement as well as improved reporting. Additionally, several large projects were implemented in 2016; these projects had consistent social media presence with organized volunteer events resulting in an outpouring of volunteer support.

Figure 2-4. Annual Volunteer Contributions (Hours) on the GMFL National Forests.



Recommendations: A Volunteer Program Coordinator is needed to expand volunteer recruitment, training, management, and reporting.

Evaluation Question: Effects of Vehicle Use Off Roads

Monitoring Question: Is the use of vehicles off roads causing considerable adverse effects on resources or other forest visitors; how effective are forest management practices in managing vehicle use off roads?

Detailed Monitoring Question: What are the trends in the illegal use of vehicles off roads?

Monitoring Activities: During fiscal years 2014 to 2016, monitoring of off-road vehicle use continued in conjunction with routine law enforcement patrols. Off-road vehicle use includes summer off-highway vehicles (OHVs), including all-terrain vehicles (ATVs) and utility terrain vehicles (UTVs), as well as winter over-snow vehicles (snowmobiles). As patrols and trail condition inventories document incidents or the issuance of notices of violation, the incidents are recorded and entered into the Law Enforcement and Investigation Management Attainment and Reporting System (LEIMARS) database. Retrieved data can be used to show trends; however, the number of incidents fluctuates depending on the availability of law enforcement and forest protection officer personnel.

Evaluation & Conclusions: This monitoring question measures the change in law enforcement incidents and violations utilizing data entered over the ten-year period of 2006-2016 for the Green Mountain and Finger Lakes (GMFL) National Forests (data reports do not differentiate by state or forest). Figures 2-5 and 2-6 show trends and provide baseline quantitative data to which monitoring can be added annually. Data are separated into “incidents” (includes warnings and visual identification of a violation) and “violations” where somebody receives a citation for the infraction.

The data shows an overall decreasing trend from 2006 to 2016 for OHV incidents and violations in Vermont and New York. The reasons for this trend is unclear, but could be the result of: 1) a decreased field presence of law enforcement personnel; 2) better understanding from the public due to improved education, signing and barrier control efforts; and 3) increased partner collaboration to help address unauthorized use and to better align public demand for snowmobile and off-highway vehicle trails with approved and designated National Forest System trails. In addition, the Forest Service has been making a focused effort to include mitigation measures for site-specific projects to deter unauthorized vehicles through public collaboration and education, and installation of signing and engineering controls such as gates, stiles and boulders.

The data shows no discernible trend in snowmobile incidents and violations for the 2006 to 2016 period. This is likely the result of varying levels of law enforcement personnel, including Forest Protection Officers, and fluctuating capacity to provide weekend snowmobile patrols.

Figure 2-5. Law Enforcement Incidents and Violations for Over-Snow Vehicles between 2006 and 2016 on the Green Mountain and Finger Lakes National Forests (combined).

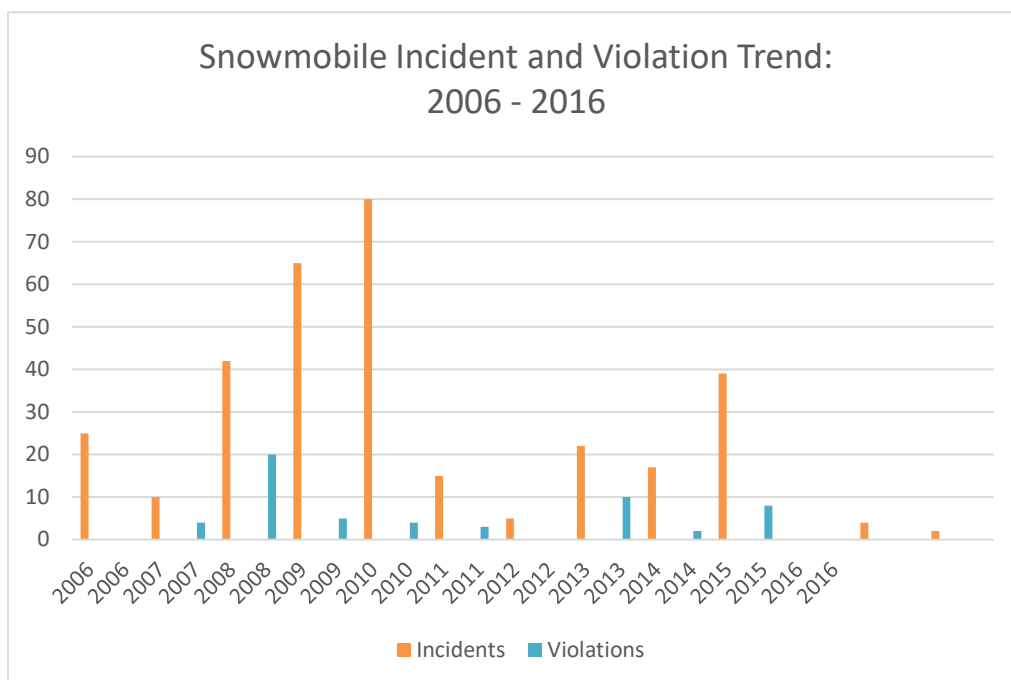
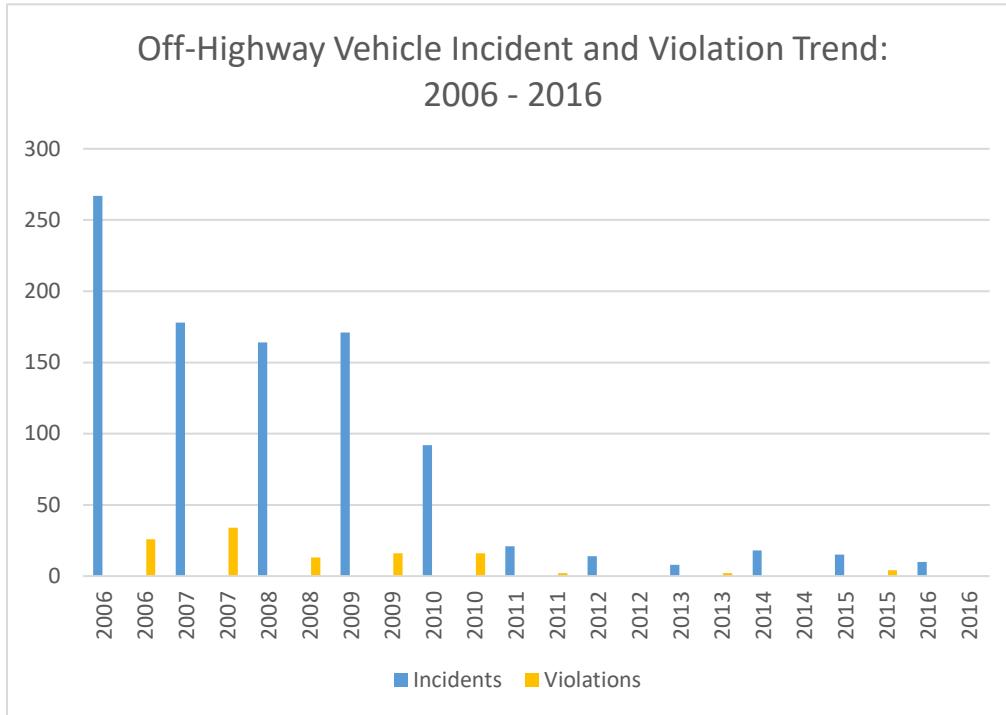


Figure 2-6. Law Enforcement Incidents and Violations for Off-Highway Vehicles between 2006 and 2016 on the Green Mountain and Finger Lakes National Forests (combined).



Recommendations: Continue to work with law enforcement to refine methods of collecting and analyzing data so that summer off-highway vehicle and over-snow vehicle incidents are accurate and mapped with GIS, including distinguishing between incidents in Vermont and New York. Add more qualitative data such as narratives based on site specific project analyses and monitoring. Increase patrol and presence in areas with repetitive violations and install travel management barriers to deter repetitive, unauthorized use.

Evaluation Question: Visual Quality Objectives

Monitoring Question: To what extent have Objectives been attained?

Detailed Monitoring Question: Is the Forest being managed in accordance with the visuals standards and guidelines found in the Forest Plan and are the visuals standards and guidelines and any additional site-specific design criteria effective in helping to meet the VQOs (Visual Quality Objectives)?

Monitoring Activities: Annual monitoring trips provide the opportunity to review project implementation and adherence to Forest Plan Forest-wide Visual Quality standards and guidelines (Forest Plan, Section 2.3.14, pp. 32 and 33), as well as project-specific design criteria and mitigation measures. During the monitoring trips, resource staff determine if the VQOs were met and if not met, discuss what could have been done to achieve VQO and/or what could be done toward meeting VQO.

Additionally, ongoing field reviews identify visual concerns from project implementation and major storm events as well as opportunities to enhance visual resources.

Evaluation and Conclusions: Based on available documentation, annual monitoring trips did not identify any projects that failed to adhere to VQOs.

Recommendations: Continue to monitor the visual resource for compliance with Forest Plan standards and guidelines. Look for opportunities for rehabilitation following major storm events as well as opportunities for visual enhancement along roads, trails and recreation sites.

Evaluation Question: Scenic Integrity Objectives

Monitoring Question: To what extent have Objectives been attained?

Detailed Monitoring Question: Has the Forest transitioned from the current Visual Management System to the Scenery Management System?

Monitoring Activities: The transition to managing with scenic integrity objectives from using the Visual Management System to the Scenery Management System (SMS) has not been completed.

Evaluation and Conclusions: Competing priorities and inadequate staff and skills have delayed the transition to the SMS.

Recommendations: Forest Service staff should continue to explore opportunities to transition to the SMS as soon as practical.

Soils

Evaluation Question: Soil and Water Standards and Guidelines, Mitigation Measures, and Soil Quality Standard Compliance

Monitoring Question: To what extent have Standards and Guidelines been applied?

Detailed Monitoring Question: Were Standards and Guidelines and mitigation measures implemented on selected projects, and to a lesser extent, were they effective in protecting the soil and water resources?

Monitoring Activities:

1) Soil, Water and Riparian Resource Monitoring

In fiscal years 2014 to 2016, soil monitoring activities measured the implementation and effectiveness of Forest Plan Standards and Guidelines (S&Gs) designed to control erosion, prevent sedimentation, protect wetlands, and maintain soil and water quality. Periodic visits were made to recreation, construction, and road maintenance projects, and special use permit sites to determine whether Forest Plan S&Gs and mitigation measures were implemented and effective in minimizing soil erosion, stream sedimentation, and impacts to wetlands and water quality. This monitoring also helped determine whether Forest Plan Goals 3 and 4 of the Forest Plan were achieved. These goals direct the Forest Service to maintain the ecological functions of the soil, and maintain or restore aquatic, riparian, and wetlands habitats (Forest Plan, pp. 12 and 13). Soil ecological functions include the ability of the soil to store water, provide a substrate for plant growth, filter pollutants, and store carbon.

Monitoring was completed by Forest Service soil scientists and technicians. The monitoring method consisted of a visual inspection of primarily recreation trails.

2) Soil Disturbance/Soil Quality Monitoring

No soil disturbance or soil quality monitoring was conducted in conjunction with vegetation management activities since none occurred during this monitoring period.

3) Wetland Implementation Monitoring

Wetland monitoring was conducted at recently constructed wetlands to assess whether they were functioning as designed, since wetlands were first created on FLNF starting in fiscal year 2013 as approved in the Dugue Road and Aman North Wetlands Creation Decision Memo dated May 2013. The first wetland creation included five small wetlands at Dugue Grassland in 2013, five in Aman North Grassland in 2014, three in Ahouse West Grassland in 2014, and three in Potomac North Grassland in 2015. Terry Berry Wetland was constructed in August 2016. All were monitored after construction.

Visual and wetland hydrology and species monitoring with photo documentation, and audio frog monitoring were conducted at the constructed wetlands to assess whether they functioned as designed.

Hydrology monitoring consisted of visually estimating the area of each constructed wetland's extent occupied by standing water, wet sediment, or dry sediment. The full extent was considered the area covered in standing water at the point of overflow at the constructed spillway. Hydrology was monitored on 13 days spaced about two weeks apart from March 31 to October 1, 2015 at each of the 13 constructed wetlands at Dugue, Aman North, and Ahouse West Grasslands. These wetlands plus Terry Berry wetland were monitored a day each in March, May, July, August, and September 2016.

Plant and animal species of interest were recorded during each hydrology/photo-monitoring visit, in addition to four pictures of each wetland - one facing the wetland from each cardinal direction (north, south, east, west).

Audio frog monitoring was completed one evening in April, May, and June 2015 using FrogWatch USA methodology to assess the presence and levels of five species: Wood Frog, Spring Peeper, Green Frog, Gray Tree Frog, and American Toad.

Evaluation and Conclusions:

1) Soil, Water and Riparian Resource Monitoring

Forest Plan S&Gs and project specific mitigation measures were usually met and were effective in protecting the resources. Overall impacts to soil, water, and wetland resources were small in magnitude, duration, and extent. Erosion, stream sedimentation, and wetland disturbance were not often observed. In the instances requiring improvement, all related to recreation trail use and maintenance, further damage to resources was avoided through communication with staff and corrective action.

2) Soil Disturbance/Soil Quality Monitoring

No monitoring occurred.

3) Wetland Implementation Monitoring

Percent standing water was close to 100 percent most of the year in fiscal year 2015 at most of the wetlands. Percent standing water dropped to 50 to 60 percent by mid-September in Dugue 2 and Aman North 1 and 2, 30 to 40 percent in Aman North 3 and 4 and Ahouse West 2, and 10 percent in Dugue 3. There was no standing water by mid-September in Dugue 5 and Ahouse West 3 and 4. In fiscal year 2016, percent standing water in March and May was 100 percent in all wetlands. In July, August, and September, standing water ranged from 0 to 10 percent at all wetlands, except for the Potomac North wetlands. Potomac North 1 had 10 to 60 percent standing water, Potomac North 2 had 80 percent standing water, and Potomac North 3 had 30 to 80 percent standing water. Terry Berry was monitored once on September 13, 2016, just after construction and was found with five percent standing water. These numbers indicate the wetlands are functioning as designed holding water for most of the year but dry up

during the driest season of some years. This helps to not support predatory amphibian species requiring year-round water.

Plant and animal notes taken at the wetlands in 2015 include the presence of tadpoles, ground nuts, tickseed sunflower, dense cattail cover at Dugue 3. In 2016, cattails were observed at all five of the Dugue wetlands, two at Ahouse West, and four at Aman North, although only 6 or 7 had dense cattail patches. None were observed in Potomac North or Terry Berry. Many spring peepers and other frogs were heard, frog eggs, tadpoles, caddis flies, dace, leopard frogs, mallards were observed, and wetlands were well vegetated with wetland species. The wetlands are functioning as a hotspot for diversity and are supporting a variety of amphibian species as intended. A large variety of wetland plant species planted and seeded thrived at the wetlands.

Recommendations:

1) Soil, Water and Riparian Resource Monitoring

Continue similar monitoring.

2) Soil Disturbance/Soil Quality Monitoring

Monitor soil quality before and after timber harvests using the Forest Soil Disturbance Monitoring Protocol (Page-Dumroese et al. 2009) if they occur, including multiple units per harvest prescription, focusing on sensitive soils, biomass harvest, and summer harvests, where soil disturbance is expected to be highest.

3) Wetland Implementation Monitoring

Continue similar monitoring. Once a month is sufficient for hydrology monitoring. Not as many pictures are needed on future visits - one per wetland each trip would suffice.

Terrestrial Wildlife Habitat

Evaluation Question: Grassland Habitat

Monitoring Question: To what extent do Forest Service Management activities contribute toward restoration and maintenance of habitat for native and desirable non-native species?

Detailed Monitoring Questions: What are the conditions of grasslands and pastures on the FLNF? What are the vegetative conditions and wildlife use patterns of grazed and non-grazed grasslands? Do maintenance programs produce desired conditions?

Monitoring Activities: Grassland bird surveys on grassland units scheduled to have treatments were completed in fiscal years 2014 to 2016. Grassland bird surveys are conducted annually on pastures and fields designated by Forest Service staff as candidates for maintenance mowing or other treatments. Weather conditions may affect surveys since they cannot be completed when rain, dense fog, persistent winds greater than 5 mph, or when high temperatures and humidities can suppress bird song.

In a typical year, the surveys are conducted from the last half of May through the first week of July. Based on 90 years of first Spring arrival dates for the nearby Cayuga Lake Basin (Smith, unpublished), all migratory grassland birds have arrived in the area by an average date of May 5 and have settled on their territories by the last week of May. In a typical year, bobolinks are forming pre-migratory flocks by mid-July, sometimes earlier.

A survey route is typically followed that allows the observer to access all parts of a pasture or field, so that detection of birds by either sight or sound is optimized, using detection distances established during past field work for Henslow's sparrow and grasshopper sparrow for guidance. Of the grassland birds observed on FLNF, Henslow's sparrow possibly has the weakest, most difficult to detect song. In surveying pastures and fields using the area-search method, an estimated distance of at least 300 feet is maintained from the fence (or other obvious boundary for fields that were not pastured or fenced) marking the boundary of the area being surveyed. All obligate grassland bird species detected "within the fence line" were identified and counted and their breeding status noted. If either Henslow's sparrow or grasshopper sparrow are detected by song, visual confirmation of its identity was attempted.

Evaluation and Conclusions: In fiscal year 2014, there were 28 pastures/grasslands surveyed and seven RFSS species documented. In fiscal year 2015, there were 24 pastures/grasslands surveyed and three RFSS documented. In fiscal year 2016 there were 24 pastures/grasslands surveyed with no RFSS documented. The yearly grassland bird surveys with the presence of savannah sparrows recorded where they were found. Savannah sparrows were found in 51 of 75 units surveyed in the three years monitored.

The major emphasis for the Grasslands for Wildlife Management Area (MA) is "...to provide cover and nesting habitat for game and non-game species that are dependent on grassland habitats..." (Forest Plan, p. 44). Monitoring surveys show grassland conditions within the MA are providing the habitat intended by this direction.

The major emphasis for the Grasslands for Grazing MA is "to provide grasslands for domestic livestock grazing" to provide management of grass forb production (Forest Plan, p. 41). Maintenance of grassland pastures is commensurate with producing edible forage for cattle as well as both game and non-game species. Quality and amount of grazing forage is addressed in the Animal Unit Months monitoring item.

Recommendations: The MA Wildlife Guidelines G-2 states: "Snags and large-diameter trees in, and adjacent to, grasslands should be retained as raptor perches". This could be revised to state: "some snags and large diameter trees..." to allow more flexibility to increase utilization by grassland birds. Raptor perches are not limited on FLNF. Desired future conditions are still applicable.

Evaluation Question: Wildlife Reserve Trees

Monitoring Question: To what extent do Forest Service management activities contribute toward restoration and maintenance of habitat for native and desirable non-native species?

Detailed Monitoring Questions: Are we retaining the best individual trees and snags? How do they persist/ improve/degrade over time? How well did retained future trees and snags develop over time?

Monitoring Activities: No specific monitoring was completed during fiscal years 2014 to 2016 to assess retention of trees and snags, how they persist/improve/degrade over time, or how well retained future trees and snag develop over time.

Evaluation and Conclusions: No data was collected or recorded for the question indicator or measurement during this monitoring period.

Recommendations: No recommended changes.

Terrestrial Wildlife Population

Evaluation Question: Threatened, Endangered, and Sensitive Bats

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

Detailed Monitoring Question: Are management actions adequately protecting ecological conditions required by threatened, endangered, and sensitive bat species known to occur on National Forest System lands?

Monitoring Activities: Indiana bat (*Myotis sodalists*) is a federally listed endangered species (Appendix B, Table B-1). Eastern small-footed bat (*Myotis leibii*), little brown (*Myotis lucifugus*), northern long-eared bat (*Myotis septentrionalis*), and tri-colored bat (*Perimyotis subflavus*) are identified as sensitive species (listed as Regional Forester Sensitive Species as of December 2011). The Anabat is a system of specialized bat detectors and analysis software used to identify and survey bats by recording their ultrasonic echolocation calls. Anabat driving routes were performed in fiscal years 2014 and 2015; but no records could be found for fiscal year 2016.

Evaluation and Conclusions: All projects must comply with Endangered Species Act consultation requirements prior to implementation to ensure Indiana bat protection. All site-specific project analyses include a biological evaluation to ensure sensitive species viability and to preclude trends toward endangerment that would result in the need for Federal listing. Although Anabat monitoring was completed in fiscal years 2014 and 2015, the data is not available.

Recommendations: No recommended changes.

Evaluation Question: Threatened, Endangered, and Sensitive Herptiles (snakes, turtles, salamanders, bog turtle)

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

Detailed Monitoring Question: What are the population trends of black rat snake; bog and wood turtles; Jefferson, blue-spotted, longtail, and slimy salamanders on the FLNF and adjacent lands? Do they need protection or habitat management?

Monitoring Activities: There are no herptiles identified as sensitive species (listed as Regional Forester Sensitive Species as of December 2011). No specific monitoring was completed in fiscal years 2014 to 2016 to ascertain the presence, location and number of herptile individuals and no recorded sightings are available.

Evaluation and Conclusions: Although no herptiles are considered sensitive species, and effort is made to protect amphibian habitat with associated Forest Plan Forest-wide standards and guidelines and project specific mitigation measures. There has been no indication these species need any additional protection beyond Forest Plan standards and guidelines and project specific mitigation measures.

Recommendations: Consider removing this question from the monitoring program. None of these species are currently on the RFSS list for FLNF. While these species distribution and state ranking vary, Forest Service staff have not collected any associated information and will not likely have resources to determine their presence based on other priority species.

Vegetation

Evaluation Question: Outputs Accomplished - Volume and Acres of Timber Offered and Sold

Monitoring Question: How close are actual outputs and services to projected outputs and services?

Detailed Monitoring Question: How do actual outputs compare to those projected in Appendix D, Proposed and Probable Practices, specifically related to timber offered and sold?

Monitoring Activities: Forest Activity Tracking System (FACTS) and Timber Sale Accounting (TSA) reports were used during fiscal years 2014 to 2016 to monitor timber offered and sold along with the type of timber harvesting practices used to implement the Forest Plan.

Evaluation and Conclusions: No timber sales were sold or operated during this monitoring period. No progress was made in achieving the annual allowable sale quantity (ASQ). The Forest Plan average annual Allowable Sale Quantity (ASQ) is the maximum amount of timber volume that may be offered and sold during Decade 1 (2006 to 2015), expressed on an annual basis. The annual average ASQ for FLNF is 258 thousand board feet (MBF). The annual amount of timber sold may exceed 258 MBF as long as the decadal ASQ (2.58 million board feet) is not exceeded.

The amount of timber volume sold and acres harvested each year remain well below the levels stated in the Forest Plan. Only one timber sale has been sold and operated on FLNF since Forest Plan revision was completed in 2006 (Cotton Mill Timber Sale). That sale included approximately 510 thousand board feet (mbf) of timber volume on 65 acres, which is approximately 25 percent of the estimated output for the first ten years of Forest Plan implementation. This shortfall in timber output limits the Forest Service's ability to meet other Forest Plan goals and objectives such as those related to habitat, age class, or composition. Work has started on the Finger Lakes Invasive Pest Strategy project which may lead to additional timber harvesting on up to 800 acres over the next five to ten years.

Recommendations: No recommended changes.

Evaluation Question: Stocking Level

Monitoring Question: Are harvested lands adequately restocked according to Forest Plan goals?

Monitoring Question: Are lands adequately restocked within five years of a regeneration harvest or site preparation activities?

Monitoring Activities: Monitoring protocols and procedures for stocking surveys are well established and consistent with Forest Service Handbook (FSH 2409.17, Silvicultural Practices). Reforestation success is measured on new plantations or harvested stands in years one, three, and five (if needed) following the planting or other regeneration effort. Successful reforestation is assured when new stands are certified as "free to grow" by year five. No stands were surveyed for first, third or five year stocking surveys during fiscal years 2014 to 2016 since the only regeneration harvest completed since Forest Plan revision (11 acres harvested in 2010) was certified fully stocked in fiscal year 2013.

Evaluation and Conclusions: None needed.

Recommendations: No recommended changes.

Evaluation Question: Sustainability of Special Forest Product Gathering

Monitoring Question: To what extent have Objectives been attained?

Detailed Monitoring Questions: How many and what special forest products do people gather? How many require permits, and how many permits were issued annually, for which products/species? How many requests for permits were denied? How many SFPs are being evaluated for permit requirement?

Monitoring Activities: Forest Service staff monitor the quantity and type of permitted Special Forest Products (SFP). Firewood is the only SFP gathered by permit on the FLNF since Forest Plan revision. Firewood removal is monitored during regular patrols conducted by Law Enforcement and Forest Protection Officers. Illegal tree cutting and removal is also tracked annually on FLNF. Often this is related to illegal firewood removal, although it also includes cutting trees around campsites as well as theft of valuable timber.

Evaluation and Conclusions: Firewood permit volumes have been variable, ranging between 40 to 110 cords per year since 2006. During fiscal years 2014 to 2016, firewood permit volume was stable with 59 cords, 63 cords, and 50 cords authorized in fiscal years 2014, 2015, and 2016, respectively. This averages about 57 cords per year during this monitoring period.

The Forest Service continues to evaluate opportunities for additional firewood harvesting to meet demand. Several factors support the sustainability of this increased use, including (1) timber harvesting on the FLNF is well below the Allowable Sale Quantity established in the 2006 Forest Plan; (2) the focus of firewood harvesting is on readily accessible dead and down trees; and (3) an increasing abundance of dead and dying trees due to the maturing of forests and density related mortality.

There have been no requests for any historically gathered products other than firewood on FLNF, such as Christmas trees, boughs, and small trees. The following SFPs have been identified as being of concern in the FLNF area in terms of sustainable harvesting: ginseng, lady slippers, wild leeks, fiddleheads, sweetgrass, and black ash. Occasionally there are queries about gathering products such as ginseng or goldenseal, as well as other plants. Ginseng and goldenseal are not known to occur on FLNF, and if they were found, they would be protected plants as their populations would be small and vulnerable. Lady slippers are already protected from harvesting in the State of New York and on FLNF. Personal use of leeks, fiddleheads, and other plants do not require a permit when gathered in small quantities. This use is not monitored, however public queries are infrequent – perhaps one or two per year on average, and overall collection rates seem to be low based on observed use.

Recommendations: No recommended changes.

Evaluation Question: Rare or Outstanding Natural Areas

Monitoring Question: To what extent have Forest Plan Objectives been attained?

Detailed Monitoring Question: To what extent are rare and outstanding biological, ecological, or geological features on the FLNF being protected, maintained, or enhanced?

Monitoring Activities:

The following site visits occurred during fiscal years 2014 to 2016:

- Hector Oak Woods cRNA (8/3/2013)
- Potomac Creek Woods (7/22/2014)

- Blueberry Patch Swamp (10/13/2014)
- Caywood Point Cliffs and Woodland (10/28/2015)
- Sawmill Creek Ravine cRNA (8/4/2013, 7/27/2014, 10/29/2015)

Additional monitoring activities or actions:

- April 2015 Decision Memo for hemlock woody adelgid control actions, which includes portions of Caywood Point Cliffs and Woodland, The Gorge, The Ravine, South of Blueberry Patch, Mill creek Ravine, and Breakneck Creek Ravine sites.
- Hemlock woody adelgid treatment implemented in summer 2014 at Caywood Point Cliffs and Woodland. Effectiveness was monitored during the 2015 site visit.

Evaluation and Conclusions: Although the Forest ecologist position was vacant starting in 2016, Forest Plan Goal 6 and associated objective to protect rare natural communities were met during this monitoring period (Forest Plan, p. 13). Sites on FLNF with outstanding biological, ecological, or geological features were monitored at a rate to keep up with the Forest ecological program's desired 5-year site visit interval. NNIP infestations were documented at many of the sites and control treatments are needed to maintain the integrity of these sites (see Non-native Invasive Species monitoring item). Additional treatment to control hemlock wooly adelgid is also needed.

Recommendations: No recommended changes.

Water

Evaluation Question: Forest-wide Water Quality Monitoring

Monitoring Question: To what extent is Forest management affecting water quality, quantity, flow timing, and the physical features of aquatic, fisheries, riparian, vernal pool, and wetland habitats?

Detailed Monitoring Question: What is the existing status of water quality on the FLNF, and how are our management activities affecting water quality?

Monitoring Activities: No water quality, water quantity or flow timing monitoring was conducted during fiscal years 2014 to 2016. Data available from the USGS stream gaging network are minimal in the area and not representative of stream flow and timing issues that may influence management of streams on FLNF. Although data were not collected for this monitoring question, it is presumed the Forest Service staff did not permit any activities that were likely to degrade processes related to stream flow quantity or timing. Such activities could include large-scale conversion of land use and land cover types (such as forested lands to agricultural lands) or installation of a dam.

During this monitoring period, no dams were removed that would restore more natural processes related to stream flow quantity and timing. Project activities did include the complete construction of wetlands/ restoration of wetland function at three sites; Ahouse 2-4, Potomac North 1-3, and Terry Berry (see Soil and Water Standards and Guidelines, Mitigation Measures, and Soil Quality Standard Compliance monitoring item). These projects are intended to reduce flood flows and increase base flows, though this effect may only be measurable at the small scale until hydrological functions can be restored across more of the landscape.

Evaluation and Conclusions: Water quality on FLNF are generally impacted by legacy land use impacts, existing roads, and livestock grazing. Although data are not available to specifically discuss the condition of water quality, permitted and administrative land uses are generally designed with the intent of preventing degradation of water quality or of restoring previously degraded water quality.

Monitoring stream discharge (quantity and timing) in the plan area is not within the financial and technical capability of the Forest, even with assistance from partners. Given the Forest Service's capacity for monitoring stream discharge, this monitoring question does not appear to be well suited to helping decide whether management is meeting the objectives in the Forest Plan, or what impacts climate change may be having on Forest resources. Related indicators such as regional precipitation and temperature patterns may be appropriate in addressing the climate-related core monitoring element but are not likely useful in determining whether plan components are effective and appropriate and whether management is being effective in maintaining or achieving progress toward the desired conditions and objectives for the plan area.

Recommendations: Consider removing or modifying this question and related indicator(s) from the monitoring program.

3. List of Preparers

Table 3-1 provides the Forest Service interdisciplinary team that collected, evaluated, or compiled data for the fiscal years 2014, 2015, and 2016 Annual Monitoring and Evaluation Report:

Table 3-1. Preparers of the fiscal years 2014 to 2016 Annual Monitoring and Evaluation Report.

Name	Position or Resource
Jay Strand	Monitoring Team Leader/Forest Planner
Holly Knox	Recreation Program Manager/Public Services Staff Officer
Suzanne Gifford	Ecologist
Gregory Flood	Wildlife Biologist
Dan McKinley	Fisheries Program Manager
John Mccann	Watershed Program Manager
Angie Quintana	Soil Scientist
Jeffrey Tilley	Silviculturist
MaryBeth Deller	Botanist
Matt Lark	Range
Steven Pytlik	Recreation Planner
Karen Bucher	Archaeologist and Heritage Resource Specialist
Lindsay Rae Silvia	Fire and Fuels Technician
Tami Schroeder	Realty Specialist
Brian Austin	Engineer
Ethan Ready	Public Affairs Officer

Appendix A: Payments to Towns

There are two types of federal payments reaching municipalities that have National Forest System (NFS) lands: 1) Payments in Lieu of Taxes (PILT); and 2) Public Law 106-393, Secure Rural Schools and Community Self-Determination Act of 2001, reauthorized in 2008. Payments in lieu of taxes funds are directed to towns, and the Public Law 106-393 funds are directed to school districts.

Payments in Lieu of Taxes

Generally, federal lands may not be taxed by state or local governments unless they are authorized to do so by Congress. Since local governments are often financed by property or sales taxes, the inability to tax the property values or products derived from the federal lands may significantly affect local tax bases. Instead of authorizing taxation, Congress created various payment programs designed to make up for lost tax revenue.

Under current federal law, local governments are compensated through various programs for losses to their tax bases due to the presence of most federally owned land. The most widely applicable program, while run by the Bureau of Land Management, applies to many types of federally owned land, and is called "Payments in Lieu of Taxes" or PILT.

The level of PILT payments is calculated under a complex formula which considers figures such as acres of eligible lands, population, and previous year payments from other federal agencies. The PILT, made in or around October, is indexed by the inflation rate and set by federal law.

Table A-1 shows PILT payments and entitlement acres for Vermont towns and counties. Each town can receive additional PILT dollars if they contain other federal lands, such as National Park Service or Army Corps of Engineer lands. Not all federal acres within towns are entitled to PILT payments.

Table A-1. New York Payments in Lieu of Taxes (PILT) and acreage for fiscal years 2014 to 2016.

Government Unit	2014 PILT Payment ¹	2014 Entitlement Acres ²	2015 PILT Payment	2015 Entitlement Acres	2016 PILT Payment	2016 Entitlement Acres
ALBANY COUNTY	\$0	15	\$0	15	\$0	15
ALLEGANY COUNTY	\$0	13	\$0	13	\$0	13
BROOME COUNTY	\$7,488	2,905	\$7,401	2,905	\$7,537	2,905
CATTARAUGUS COUN	\$5,950	2,308	\$5,880	2,308	\$5,988	2,308
CHENANGO COUNTY	\$0	1	\$0	1	\$0	1
COLUMBIA COUNTY	\$114	44	\$112	44	\$114	44
CORTLAND COUNTY	\$4,299	1,668	\$4,250	1,668	\$4,328	1,668
DELAWARE COUNTY	\$1,521	590	\$1,503	590	\$1,531	590
DUTCHESS COUNTY	\$32,286	5,164	32,186	5,174	\$32,630	5,174
ERIE COUNTY	\$454	176	\$448	176	\$457	176
GREENE COUNTY	\$574	223	\$568	223	\$579	223
LIVINGSTON COUNT	\$6,392	2,480	\$6,319	2,480	\$6,434	2,480

Government Unit	2014 PILT Payment ¹	2014 Entitlement Acres ²	2015 PILT Payment	2015 Entitlement Acres	2016 PILT Payment	2016 Entitlement Acres
NASSAU COUNTY	\$245	95	\$242	95	\$247	95
ONEIDA COUNTY	\$0	16	\$0	16	\$0	16
ORANGE COUNTY	\$7,711	2,742	\$6,986	2,742	\$7,115	2,742
PUTNAM COUNTY	\$7,610	975	\$7,444	975	\$5,976	975
RENSSELAER COUNT	\$0	7	\$0	7	\$0	7
SARATOGA COUNTY	\$3,730	1,447	\$3,687	1,447	\$3,754	1,447
SCHUYLER COUNTY	\$15,741	10,987	\$16,526	10,987	\$17,244	10,987
SENECA COUNTY	\$7,371	5,276	\$7,623	5,276	\$8,010	5,276
STEUBEN COUNTY	\$2,838	1,101	\$2,806	1,101	\$2,857	1,101
SUFFOLK COUNTY	\$6,846	2,656	\$6,767	2,656	\$6,891	2,656
SULLIVAN COUNTY	\$0	9	\$0	9	\$0	9
WASHINGTON COUNT	\$183	71	\$181	71	\$184	71
WESTCHESTER COUN	\$0	5	\$0	5	\$0	5
WYOMING COUNTY	\$3,459	1,342	\$3,419	1,342	\$3482	1,342

¹ Not all towns listed are within the National Forest boundary, however they still receive PILT payments based on the presence of other federal lands within their boundaries.

² Entitlement acres are those lands that were not tax exempt (such as owned by state or local government) prior to when the land was conveyed to the United States.

Secure Schools Act

The Secure Rural Schools (SRS) and Community Self-Determination Act of 2001 (Secure Schools Act) was reauthorized for four years in 2008. This law was promulgated by Congress to restore stability and predictability to the annual payments made to states and counties containing NFS lands for the benefit of schools and roads. Prior to the passage of the Secure Schools Act, these payments were based upon income generated by the USDA Forest Service, typically through timber sales. As this timber sale-related income fluctuated and generally waned, communities that relied on the annual payments for the support of their schools suffered from a lack of funding stability and predictability, to the detriment of their educational systems. The Secure Schools Act severs the tie between rural school funding and timber sale income to offer rural school systems continual, level funding. Table A-2 provides the payments to New York by county in fiscal years 2014, 2015, and 2016. Note that the acres for PILT payments are not the same as for SRS payments; PILT is distributed to “Entitlement Acres,” SRS is distributed for all NFS land acres.

Table A-2. Secure Rural Schools payments by New York county for fiscal years 2014 to 2016.

County	Fiscal Year 2014		Fiscal Year 2015		Fiscal Year 2016	
	Payment Amount	Acres	Payment Amount	Acres	Payment Amount	Acres
Schuyler County	\$11,460.01	11,083	\$12,084.64	11,083	\$1,529.04	11,083
Seneca County	\$5,778.90	5,269	\$6,170.43	5,269	\$729.04	5,269

Appendix B: Threatened, Endangered and Sensitive Species (Fauna and Flora)

Table B-1 lists federally listed threatened and endangered wildlife species specific to the Finger Lakes National Forest per the Endangered Species Act during the fiscal years 2014 to 2016 monitoring period.

Table B-1. Wildlife species listed as threatened or endangered under the Endangered Species Act with current or historic occurrence on Finger Lakes National Forest.

Common Name	Scientific Name	ESA Status	Status on GMNF
Gray wolf	<i>Canis lupus</i>	Endangered	Historic only
Canada lynx	<i>Lynx canadensis</i>	Threatened	Historic only
Indiana bat	<i>Myotis sodalis</i>	Endangered	Current

Table B-2 lists the Finger Lakes National Forest Regional Forester Sensitive Species (fauna and flora) dated December 2011.

Table B-2. Species listed on the Regional Forester Sensitive Species List (fauna) specific to Finger Lakes National Forest.

MAMMALS	
<i>Myotis leibii</i>	Eastern Small-footed bat
<i>Myotis lucifugus</i>	Little Brown Myotis
<i>Myotis septentrionalis</i>	Northern Myotis
<i>Perimyotis subflavus</i>	Tri-colored Bat
BIRDS	
<i>Accipiter gentilis</i>	Northern Goshawk
<i>Ammodramus henslowii</i>	Henslow's Sparrow
<i>Ammodramus savannarum</i>	Grasshopper Sparrow
<i>Bartramia longicauda</i>	Upland Sandpiper
<i>Circus cyaneus</i>	Northern Harrier
<i>Spizella pallida</i>	Clay-colored Sparrow
INVERTEBRATES - BIVALVES	
<i>Lasmigona subviridis</i>	Green Floater
INVERTEBRATES - INSECTS	
<i>Cordulegaster obliqua</i>	Arrowhead Spiketail
<i>Pieris virginiensis</i>	West Virginia White
PLANTS	
<i>Alium cernuum</i>	Nodding Onion
<i>Arabis drummondii</i>	Drummond Rockcress
<i>Baptisia tinctoria</i>	Yellow Wild Indigo
<i>Botrychium oneidense</i>	Bluntlobe Grapefern
<i>Carex tuckermanii</i>	Tuckerman's Sedge
<i>Celastrus scandens</i>	American Bittersweet

PLANTS	
<i>Crataegus intricata</i>	A Hawthorn
<i>Gentiana clausa</i>	Bottle Gentian
<i>Juglans cinerea</i>	Butternut
<i>Lilium canadense</i>	Canada Lily
<i>Morus rubra</i>	Red Mulberry
<i>Phegopteris hexagonoptera</i>	Broad Beech Fern
<i>Piptatherum racemosum</i>	Black-Fruit Mountain-ricegrass
<i>Quercus bicolor</i>	Swamp White Oak
<i>Quercus muehlenbergii</i>	Chinquapin Oak
<i>Shepherdia canadensis</i>	Russet Buffaloberry
<i>Sisyrinchium mucronatum</i>	Michaux's Blue-eyed-grass
<i>Solidago squarrosa</i>	Squarrose Goldenrod
<i>Solidago ulmifolia</i>	Elmleaf Goldenrod
<i>Veronicastrum virginicum</i>	Culver's-Root

Table B-3: Finger Lakes National Forest Regional Forester Sensitive Species (RFSS) monitoring results for fiscal years 2014 to 2016.

Scientific Name Common Name (# sites surveyed)	FY14 Monitoring Results	FY15 Monitoring Results	FY16 Monitoring Results	Trend	Future Action Needed
<i>Allium cernuum</i> Nodding onion (1)	Reported '09, but no data; FY14: good-sized pop; slight threats from trampling & NNIP	Stable; treated NNIP	Not monitored	Stable	Monitor FY22
<i>Arabis drummondii</i> (= <i>Boechnera stricta</i>) Drummond rockcress (1)	Reported FY09, but no data; FY14: several patches; dispersed camping/hiking, cliff use, NNIP are threats	Stable; treated NNIP	Not monitored	Stable	Monitor FY22
<i>Baptisia tinctoria</i> Yellow wild-indigo (1)	NM	Not monitored	Not monitored	Unknown	Monitor FY17
<i>Botrychium oneidense</i> Blunt-lobed grape fern (2)	McBride site stable at 2 plants	Blueberry Patch site new: 2 sterile fronds	Not monitored	Assumed stable, though vulnerable to loss because populations tiny	Monitor McBride site FY21, Blueberry Patch Site FY22
<i>Carex tuckermanii</i> Tuckerman's sedge (2)	Stable	Not monitored	Not monitored	Stable	Re-evaluate RFSS status during FY17 update because S5 though locally rare/scarce

Scientific Name Common Name (# sites surveyed)	FY14 Monitoring Results	FY15 Monitoring Results	FY16 Monitoring Results	Trend	Future Action Needed
<i>Celastrus scandens</i> American bittersweet (21)	7 of 21 sites monitored, all stable, 1 large & thriving	2 of 21 sites monitored, stable	3 out of 21 sites monitored, stable	Stable	Re-evaluate RFSS status during FY17 update because S4 in state & now known to be common on FLNF
<i>Crataegus boyntonii</i> (= <i>C. intricata</i>) Copenhagen hawthorn (1)	Not monitored	Not monitored	Not monitored	Unknown	Monitor FY17
<i>Gentiana clausa</i> Bottle gentian (6)	1 site found & stable; 1 not found, 4 other sites NM	Not monitored	Not monitored	Unknown, but no reason to suspect loss	Monitor all sites by FY21
<i>Juglans cinerea</i> Butternut (Many)	Not monitored	Not monitored	Not monitored	Unknown, but suspected loss of individuals due to disease	Monitor individual sites as time permits
<i>Lilium canadense</i> Canada lily (3)	1 of 3 sites monitored and was not found	Not monitored	Not monitored	Unknown; small populations are found, then disappear	Monitor all sites by FY21
<i>Morus rubra</i> Red mulberry (1)	Reported FY09 but no data; FY14: abundant, but getting cut back during rec trail access; also M. Alba present & may be a threat; NNIP	Not monitored	Not monitored	Stable	Monitor by FY21
<i>Oryzopsis racemosa</i> (= <i>Piptatherum</i> <i>racemosum</i>) Black-fruited rice grass (1)	Reported FY09 but no data; FY14: Well- established & repro, but trampling near dispersed campsite & NNIP could be threats	Stable; treated NNIP	Not monitored	Stable	Monitor FY22
<i>Phegopteris</i> <i>hexagonoptera</i> Broad beech fern (3)	1 known site stable	Not monitored	2 new sites reported	Stable	Monitor original site by FY21, mark using GPS; monitor others in FY23

Scientific Name Common Name (# sites surveyed)	FY14 Monitoring Results	FY15 Monitoring Results	FY16 Monitoring Results	Trend	Future Action Needed
<i>Quercus bicolor</i> Swamp white oak (10)	1 of 10 site monitored and stable	2 out of 10 sites monitored and stable	Not monitored	Stable, but trend based on small sample	Re-evaluate RFSS status during FY17 update because S5 in state & now known to be common on FLNF
<i>Quercus muehlenbergia</i> Chinquapin oak (2)	Reported FY09 but no data; FY14: large pop; damaged by trail/parking lot maintenance; NNIP may be a threat	1 of 2 sites monitored and stable	Not monitored	Stable	Monitor both sites by FY22
<i>Shepherdia canadensis</i> Canada buffalo berry (1)	Reported FY09 but no data; FY14: small population; could be subject to cliff erosion	Not monitored	Not monitored	Stable	Monitor by FY21
<i>Sisyrinchium mucronatum</i> Sharp-tipped blue- eyed grass (2)	Not monitored	Both sites monitored and stable	Not monitored	Stable	Monitor FY22
<i>Solidago squarrosa</i> Stout goldenrod (1)	Reported FY09 but no data; FY14: stable, but trampling a potential threat due to dispersed campsite	Not monitored	Not monitored	Stable	Monitor by FY21
<i>Solidago ulmifolia</i> Elm-leaved goldenrod (1)	Reported FY09 but no data; FY14: Stable; NNIP (swallowwort) a concern	Stable; treated NNIP	Not monitored	Stable	Monitor FY22
<i>Veronicastrum virginicum</i> Culver's Root (1)	Monitored and stable	Not monitored	Not monitored	Stable	Monitor by FY21

Appendix C: Literature Cited

Flores, David, Gennaro Falco, Nina S. Roberts, and Francisco P. Valenzuela III. 2018. Recreation Equity: Is the Forest Service Serving Its Diverse Publics? Oxford University Press on behalf of the Society of American Foresters.

Page-Dumroese, D; Howes, S; Napper C. 2009. USDA Forest Soil Disturbance Field Guide. 0919 11815 – SdTDC. Moscow, ID. US Department of Agriculture, Forest Service. 99p.

USDA Forest Service. 2018a. National visitor use monitoring results: Visitor Use Report Green Mountain and Finger Lakes National Forests Data collected FY2005. USDA Forest Service. Washington, DC. Available online at <https://www.fs.usda.gov/about-agency/nvum>; last accessed October 19, 2018.

USDA Forest Service. 2018b. National visitor use monitoring results: Visitor Use Report Green Mountain and Finger Lakes National Forests Data collected FY2010. USDA Forest Service. Washington, DC. Available online at <https://www.fs.usda.gov/about-agency/nvum>; last accessed October 19, 2018.

USDA Forest Service. 2018c. National visitor use monitoring results: Visitor Use Report Green Mountain and Finger Lakes National Forests Data collected FY2015. USDA Forest Service. Washington, DC. Available online at <https://www.fs.usda.gov/about-agency/nvum>; last accessed October 19, 2018.

US Census Bureau. 2021. Quick Facts available online at <https://www.census.gov/quickfacts/fact/table/US/PST045219>; last accessed 8/3/2021.