United States
Department
of Agriculture

Forest
Service

**Eastern
Region**

R9-GM-ME
Report

September
2010

# Green Mountain National Forest

# *Annual Monitoring and Evaluation Report*

## Fiscal Year 2009

*View from Sunset Ledge to Mount Abraham*

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# Annual Monitoring and Evaluation Report

# Green Mountain National Forest

USDA Forest Service
Eastern Region
Milwaukee, Wisconsin
September 2010

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# Executive Summary

This is the fourth Monitoring and Evaluation Report compiled under the 2006 Green Mountain National Forest (GMNF) Land and Resource Management Plan (Forest Plan). The GMNF monitoring and evaluation plan is described in Chapter 4 of the Forest Plan. As explained in more detail in Chapter 4, monitoring items consist of mandatory components found in every forest plan, as well as monitoring items that are tailored to address GMNF issues raised through public scoping and interdisciplinary team review.

The Annual M&E Report provides an opportunity to track progress towards the implementation of the revised Forest Plan decisions and the effectiveness of specific management practices. The focus of the evaluation is on providing short- and long-term guidance to ongoing management. Guidance for development of the Annual M&E Report is provided in Chapter 4 of the Forest Plan and 36 CFR 219.6(a)(3) and (b)(2) requiring monitoring results be evaluated annually and provide for:

(i) Monitoring to determine whether plan implementation is achieving multiple use objectives
(ii) Monitoring to determine the effects of various resource management activities within the plan area on the productivity of the land
(iii) Monitoring of the degree to which on-the-ground management is maintaining or making progress toward the desired future conditions and objectives for the Forest Plan
(iv) Adjustment of the monitoring program as appropriate to account for unanticipated changes in conditions

The information gained from the Monitoring and Evaluation Report is used to determine how well the desired conditions, goals, objectives, and outcomes of the Forest Plan have been met. At this point with four years implementation of the revised Forest Plan, however, trends, patterns, and results generally are not clearly defined. Evaluations and conclusions that would lead to changes in the Forest Plan are not expected. Rather, this report focuses more on what we monitored, how it was monitored, how easy and efficient the protocols were to use, and how effective they were at answering the monitoring questions.

**Highlights from the Report**

In 2009, the GMNF staff monitored 58 items covering 20 areas. Highlights of these monitoring efforts include:

- Partnerships and volunteers contributed a total value of $1,499,280 through formal and volunteer agreements
- 4.8 million board feet (mmbf) of timber was offered and sold
- 2.735 mmbf were harvested
- Forest Plots to measure the combined effects of climate change were established on State of Vermont, Federal (GMNF and Marsh-Billings-Rockefeller National Historical Park, Woodstock), UVM and private lands
- 311 Special Forest Product permits produced 476 cords of fuelwood, 4,220 maple taps, 250 pounds of Fungi, 4 tons of boughs, and 155 Christmas Trees
- 328 volunteers provided 32,576 hours of service at an appraised value of $659,664
- The condition of 60 known heritage sites in project areas was monitored
- 13 sites with special features were monitored including several areas in Wilderness
- 1 human caused wildfire on approximately 0.5 acre was suppressed
- 28.2 miles of trails were surveyed for deferred maintenance
- 13 sites in 12 streams were monitored for temperature with all falling within the desired temperature range for fish habitat

- 19 sites in 15 streams were monitored for Atlantic salmon with an average of 468 juvenile salmon per mile
- 243 acres were treated for hazardous fuels
- High peaks monitoring for Bicknell's Thrush was conducted on the GMNF in conjunction with Mountain Birdwatch
- 341 acres of existing openings were enhanced and/or maintained
- 25 plant species (60 populations) on the Regional Forester Sensitive Species (RFSS) list were monitored on the GMNF
- 4 Wilderness areas were managed to national standard

*Rochester Fishing Derby*

# Key Events and Achievements in Fiscal Year 2009

***American Reinvestment and Recovery Act (ARRA)***
More than $10 million will be invested in the local economies of Vermont and New York over the next 2 years. Long-standing cost sharing partnerships will put funds to work to create jobs, and to protect and conserve natural resources. More than $3 million of ARRA funding has flowed into local economy with $2.5 million expended through agreements with the Towns of Chittenden, Goshen, Granville, Hancock, Ripton, Rochester, Peru, Sunderland, Wallingford, Weston, and Winhall for critical maintenance on important forest access roads.

More than $1.4 million was allocated to The Green Mountain Club, the Vermont Youth Conservation Corps, and the Vermont Association of Snow Travelers to maintain 627 miles of trail. These groups will hire extra crews and contract to stimulate jobs and accomplish work that reduces a large backlog of maintenance on existing hiking, skiing, biking, and equestrian and snowmobile trails.

More than $3 million will go to improving fish passage and forest health with partners like the US Fish & Wildlife Service, Vermont Agency of Natural Resources, White River Partnership, and Trout Unlimited. New culverts will enhance aquatic habitat for high priority fish species, such as the native Easter Brook Trout and Atlantic Salmon. Work with the Vermont Agency of Natural Resources includes combating invasive insects, such as the Asian long horned beetle and emerald ash borer transported in firewood.

***Stewardship Contracts***
Three stewardship contracts were implemented in the Towns of Peru, Landgrove, Londonderry, and Winhall with four additional contracts offered. The Forest Stewardship Contracting Team received the highest award in regional recognition for blending the needs of the community with the needs of Forest Management by trading forest products, or goods for restoration work, or services.

***White-nose Syndrome in hibernating bats***
Wildlife and fish crews assisted in the discovery and documentation of White-nose syndrome found in hibernating bats in New England and several adjoining states. Crews initiated new acoustical transect surveys, assisted in research projects with Boston University, and conducted research in forest bat habitat to help determine how the disease is transmitted.

***Trails Collaborative***
Convened by the University of Vermont extension, the Forest and the State of Vermont formed a Trail Collaborative to develop comprehensive trail planning. Eighteen different interest groups, ranging from non-profit trail and conservation organizations, colleges and universities, and local and state governments are participating. The formal collaborative process is scheduled to be completed by Spring of 2011 resulting in a more sustainable trail system that betters the social and biological health in the region.

***Integrated Resource Projects (IRP)***
IRPs are a collaborative approach to landscape scale projects interrelated in their geographical location and ecological value. They involve specific analysis of National Forest, State, Town and private lands within a defined project area boundary at the watershed or sub-watershed level. In 2009 the GMNF staff continued Integrated Resource Project implementation and planning. The Natural Turnpike IRP, in Ripton and Lincoln, continued to be implemented with invasive species projects. Planning and information gathering continued for the Upper White River IRP in Hancock

and Granville. In spring 2009 inventory work on the Dorset Peru IRP began. The University of Vermont LANDS and Ecological Planning Program helped conduct a multi-resource inventory and assessment of the Dorset Mountain area and inventoried non-native species and wetlands. This information along with working with the local communities and stakeholders will determine future management activities.

**Other Project Monitoring**
Monitoring of projects, large and small, occurs on all the districts and involves numerous resource professionals across the Forest. Examples include sale administrators checking loggers for compliance with contract specifications; field checking timber marking to determine consistency with marking guides; conducting regeneration surveys to determine stocking levels; checking harvest units to determine if results incorporated and achieved silvicultural prescriptions, Forest Plan objectives, standards and guidelines, project design criteria, and EA direction; and checking application of mitigation measures to determine if they are appropriate and effective. Often times the monitoring is informal consisting of general field observations. Other times monitoring is more formal and entails following protocols. Results from formal monitoring efforts are generally included in the Annual M&E Reports.

**Other Public Involvement**
The Forest Service continues to publish the Green Mountain National Forest Schedule of Proposed Actions, a newsletter containing information about upcoming and on-going projects to implement the Forest Plan. The purpose of the Schedule is "to give early informal notice of proposals so the public can become aware of Forest Service activities and indicate their interest in specific proposals" (FSH 1909.15, Section 07). We encourage the public to become part of our management process by commenting on project proposals through the National Environmental Policy Act (NEPA) process. I nformation about planning our projects and project contacts can be found on the Internet at: www.fs.fed.us/r9/forests/greenmountain/htm/greenmountain/g_proj.htm

## Approval

Having reviewed the GMNF Monitoring and Evaluation Report, I am satisfied with its findings and intend to consider recommendations made therein. The Monitoring and Evaluation report meets the intent of both the Forest Plan (Chapter 4) as well as the regulations contained in 36 CFR 219. As always, we encourage public involvement during the process of developing individual project proposals.

/s/ *Colleen Pelles Madrid* 10/18/10

COLLEEN PELLES MADRID DATE
Forest Supervisor

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# 1.1 INTRODUCTION

## Introduction

Monitoring and evaluation (M&E) are required by the National Environmental Policy Act and the National Forest Management Act to determine how well the Land and Resource Management Plan (Forest Plan) is being implemented. The M&E process enables the Forest Service to assess its effectiveness in moving toward stated management goals and desired conditions. The 2006 Forest Plan may be amended or revised to adapt to new information and changed conditions identified through M&E efforts. Through this adaptive management approach, the Forest Plan is kept current.

Monitoring is conducted to accomplish several objectives, including:

- To determine how well the goals and objectives of the Forest Plan have been met
- To determine how closely Forest Plan management Standards and Guidelines have been followed
- To determine if conditions or demands in the area covered by the Forest Plan have changed significantly enough to require a revision to the Plan

Monitoring of the Green Mountain National Forest (GMNF) began in 1987 with guidance provided in the 1987 Forest Plan. A revised Forest Plan was completed in February 2006 and includes programmatic direction for monitoring and evaluating Forest Plan implementation. Chapter 4 (M&E Chapter) of the 2006 Forest Plan 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 current state of the GMNF as well as the ideal state, which the Forest Service and interested publics envisioned as the Forest's "desired future condition." The Forest Plan allocated land to different management areas, each with a unique desired future condition, major emphasis, and management direction.

Coordination of management projects to bring about the desired future conditions stated in the Forest Plan is a complex task. The Forest Service wants to ensure that the highest priority projects are located in the most suitable areas, and that management of all resources in a particular area is integrated to improve efficiency and reduce impacts on the natural and social environments.

## Monitoring and Evaluation Guide

In addition to the guidance outlined in the 2006 Forest Plan, the GMNF staff completed an M&E Guide in June of 2007. The M&E Guide provides more specific procedural guidance to implement the monitoring strategy outlined in the Forest Plan. The M&E Guide contains specific monitoring elements, along with methods, protocols, and analytical procedures to be followed. The M&E Guide is a suite of monitoring activities that may be used to help managers understand and answer the Forest Plan monitoring questions. Based on information garnered through the annual M&E Report, the M&E Guide will be updated to incorporate suggested changes. The Forest Service will select specific monitoring activities from the M&E Guide during Forest Plan implementation.

# Annual Monitoring and Evaluation Reports

### Purpose and Scope

The Annual M&E Report provides a forum for the review of current-year findings. This report displays monitoring results 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 modified?

The Annual M&E Report is prepared by an interdisciplinary Forest Service team that incorporates information gathered from Forest Service specialists, 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 GMNF.

This Annual M&E Report evaluates the results of the monitoring accomplished during Fiscal Year 2009 (October 1, 2008-September 30, 2009), hereafter referred to as FY09. This 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 in which the GMNF engaged in FY09.

A major part of monitoring and evaluation is to determine if the resource outputs, management costs, returns, and environmental objectives were achieved as predicted in the Forest Plan. To do this, the report compares the objectives stated in the Forest Plan with what was actually accomplished during FY09.

### Annual Monitoring and Evaluation Report Outline

The remainder of this report is divided into four chapters.

- Chapter 2 consists of monitoring for 17 elements from the Forest Plan monitoring requirements. Each includes where feasible: background information; brief explanation of the monitoring activities and protocols; and discussion on the evaluation, conclusions, or recommendations.
- Chapter 3 provides a brief summary of on-going research and studies on the Forest.
- Chapter 4 discusses adjustments or corrections to the Forest Plan.
- Chapter 5 is a list of the Forest Service employees that provided information contained in this report.

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

1. NFMA implementing regulations requirements (36 CFR 219 (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 the GMNF provides.

# 2.1 DISCUSSION OF MONITORING

The following table (Table 2.1-1) consists of elements from Tables 4.1-3 through 4.1-7 of the Forest Plan. It identifies the resource element, monitoring question and drivers, and frequency of measurement that are discussed on the pages that follow in this report.

**Table 2.1-1**: Resource areas, monitoring questions and drivers, and measurement frequency discussed in this report.

| | Resource | 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? | 36 CFR 295 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 12 | Annual |
| 8 | Wilderness | To what extent is Wilderness managed to preserve its Wilderness character? | Forest Plan Goal 13 | Annual |
| 9 | Wild, Scenic, and Recreational Rivers | To what extent are eligible Wild and Scenic Rivers managed to preserve their outstandingly remarkable values? | Eligible Wild, Scenic, and Recreational Rivers Management Area Guidance; Wild and Scenic Rivers Act 16 U.S.C. 1271-1287, October 2, 1968, as amended 1972, 1974-1976, 1978-1980, 1984, 1986-1994 and 1996. | Annual |

| | | | | |
|---|---|---|---|---|
| 10 | Soil, Water, and Air | To what extent are air quality and atmospheric deposition affecting sensitive components of the forest ecosystem? | Forest Plan Goals 2-8, 12 and 13 | 1-5 Years |
| 11 | Soil, Water, and Air | To what extent are Forest Service management and restoration activities maintaining or improving soil quality? | Forest Plan Goal 3 | 1-5 Years |
| 12 | Soil, Water, and Air | 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 |
| 13 | Wildlife: Management Indicator Species | 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 produce viable and sustainable populations of native and desirable non-native plants and animals. | Annual |
| 14 | 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 |
| 15 | Vegetation | Are harvested lands adequately restocked according to Plan goals? | Lands are adequately restocked as specified in the Forest Plan. | Annual |
| 16 | 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 |
| 17 | Interpretation and Education | In what way is the Forest Service providing information and education opportunities that enhance the understanding of the GMNF? | Forest Plan Goal 19 | Annual |

# Partnerships, Information, and Education

**Evaluation Question**:
Are partnerships active and effective on the GMNF and are Forest Service personnel participating in partnership activities?

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

**Monitoring Driver**: Forest Plan Objectives

**Background**: see FY07 M&E Report.

**Monitoring Activities**: The Forest Service uses many types of agreements to document its work with other organizations and entities. Each of these has specific Congressional legal authority and requirements. The appropriate instrument depends on what the partnership will accomplish, who will benefit, and who is providing funding. The Forest Service must have appropriate statutory authority prior to entering into any agreement, which could result in the use, obligation, or other commitment of any Forest Service resources.

During FY09 the GMFL worked with 59 partners or partnership groups. Much of the trail and resource maintenance, conservation and education efforts and wildlife conservation programs and projects would not be possible without the help of our many valuable partners. Partners include individuals, non-profit agencies, other federal and state agencies, profit organizations, and universities and colleges.

***Formal Agreements**:* During FY09, there were a total of 46 signed grants and agreements and 33 modifications that provided or obligated $839,616 worth of cash, goods, and services to the GMFL from partners, and $595,393 worth of cash, goods, and services to partners from the GMFL.

***Volunteer Agreements**:* In FY09, 328 volunteers provided 32,567 hours of service at an appraised value of $659,664 to the Green Mountain and Finger Lakes National Forests.

***Total to the Forest**:* Including formal and volunteer agreements, partners gave a total value of $1,499,280 to the GMFL in FY09. This includes:

- cash contributions of over $4776,106
- in-kind contributions of over $25,836
- non-cash contributions of over $337,714

***Total to Partners**:* Contributions also went to various partners for the work they provided to support the GMFL. In FY09, there was over $571,394 in funds and over $23,999 in non-cash contributions that were obligated and/or provided by the GMFL to partners, including: challenge cost-share agreements, law enforcement agreements, and roads agreements. There were also partnerships where Forest Service's and partner's funds combined to pay for land improvements.

The GMFL has had numerous on-going informal agreements with State, county, local and other federal agencies, and non-profits that benefit the Forests. These informal partnerships have not been documented through the formal agreement process and are not accounted for in the numbers listed above; however, they do greatly benefit the GMFL.

**Evaluation and Conclusions**: Formal and informal agreements with State, county, local and other federal agencies, and non-profits can increase the amount of management and educational activities that occur on the GMNF. Partnerships also increase the ownership that these

organizations have in the GMNF. These agreements also provide GMNF staff with an opportunity to contribute to work that partner organizations value.

**Recommendations**: Continue working with existing partners and volunteers and cultivate new partners and volunteers where there is an interest from partner groups, and a potential benefit to the GMNF and nearby communities.

**Evaluation Question**:
How many agreements for fire management have been developed and maintained with outside partners?

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

**Monitoring Driver**: Forest Plan Objectives

**Background**: see FY08 M&E Report.

**Monitoring Activities**: Agreements require current template format and updates every 5 years along with an annual operating plan.

**Evaluation and Conclusions**: In FY2009, an agreement with the town of Peru was transferred to the new format, reviewed by all parties, and signed. The process of updating the nearly 30 more agreements with volunteer fire departments (VFD) in Vermont will continue in 2010.

The possibility of combining VFDs into mutual aid associations or using the State to help coordinate agreements was explored as an attempt to streamline this process. It was determined that each community needed a separate agreement.

**Recommendations**: Partnership agreements provide valuable services that help the Forest Service achieve desired management objectives. It is essential that agreements be kept current. Each outdated agreement with a volunteer fire department needs to be converted to the current template, new contact information and reimbursement rates should be updated.

Convert each outdated agreement with a volunteer fire department to the current template, and update contact information and reimbursement rates. Explore the possibility of combining VFDs into mutual aid associations or using the State to help coordinate agreements to streamline this process.

**Evaluation Question**:
Did teacher professional development in Forest stewardship occur?

**Monitoring Question:** In what way is the Forest Service providing information and education opportunities that enhance the understanding of the GMNF?

**Monitoring Driver**: Forest Plan Goal 19

**Background:** see FY07 M&E Report.

**Monitoring Activities**: In alignment with the role of the Forest, three professional development opportunities occurred in FY09 on the GMNF. Specifics on these opportunities are provided here:

**a.** ***A Forest For Every Classroom***: New England Partnership builds capacity in teachers in forest stewardship and using public lands as living classrooms.

**Location**: Green Mountain National Forest in Vermont (since 1999) and White Mountain National Forest in New Hampshire (since 2006).

**Project Summary**: The ***A Forest For Every Classroom*** creates a forest stewardship program to build capacity in teachers in (forests) place-based education. They learn about forests, ecology, stewardship of forests including public land management challenges, citizenship, place-based learning, service learning, and using public lands as outdoor classroom.

**Innovation**: ***A Forest for Every Classroom*** stands out in the education landscape of Vermont and New Hampshire as a collaboration of federal, state, non-profit organizations with common missions and visions around conservation, public lands and especially forests in the Northeast. The partners "adopt" 15-20 teachers every year and help them teach kids to love nature, forests, their communities, and take ownership in their environment.

Three teacher reunions were held to offer teachers who have completed the program additional training and knowledge in natural, cultural or historical resources.

b. **Vermont *Envirothon*** is one of the most successful partnerships that takes place in Vermont. The Vermont Association of Conservation Districts sponsors the yearly event with the following collaborators: the Natural Resource Conservation Service, Forest Service, Vermont Agency of Natural Resources, Vermont Forests and Parks, Vermont Fish & Wildlife, and several environmental groups such as Vermont Recyclers and Audubon.

For 15 years, the **Vermont *Envirothon*** has been challenging young minds to consider conservation, stewardship and environmental issues that affect their schools, community, country and the globe. High-school aged students become empowered as they work through the multi-faceted study of the environment and many go on to college and study natural resource-based careers. After college, some come back to the agencies that they learned about during their experience with the ***Envirothon***.

Teachers who coach the Envirothon have stated that the learning curve of their students in this program jumps because they better understand, from field experiences with the ***Envirothon*** program, why they need to learn math, reading, writing, and life skills. They also see the passion natural resource professionals have for their careers and the assessments, investigations, findings—real life issues--in which they are involved.

The goal of the **Vermont *Envirothon*** Program is not only to teach environmental concepts and realities, but also to instill an understanding of the ecological and community factors that are involved in environmental decisions and actions. The program sets up a different environment challenge each year as well as teach basic concepts in soils, forestry, aquatic environment and wildlife. Students also learn decision-making, problem solving, team-building and communications skills.

In 2009, six Vermont schools participated in the Vermont Envirothon totaling 192 students, educators, and volunteers who participated.

**c.** **Salmon in the Classroom** program assists teachers through a science-based curriculum that exposes the elementary and middle school students to the wonders of the Atlantic

salmon life cycle and their environment. The program is designed to inform and empower students as the future generation of natural resource stewards. In Vermont, over 1000 students were involved in the program**.**

In FY09 Forest staff, along with state and federal partners, continued to provide environmental education to Vermont students through the "Salmon the Classroom" program. Forest Service fisheries technicians assisted students and teachers in 10 schools with setting up incubation tanks for Atlantic salmon eggs. The students take care of the tanks as they observe the eggs developing week by week until they hatch into tiny salmon. The annual culmination of the program is the release of the salmon fry into a nearby stream with hopes that one day they will return to spawn.

**Recommendations**: Continue to provide professional teacher development opportunities through the continuation of these programs and facilitate ideas that get families and children into the natural world.

# Forest Plan Implementation

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

**Monitoring Driver**: A quantitative estimate of performance comparing outputs and services with those projected by the 2006 Forest Plan.

**Background**: See FY07 M&E Report.

**Monitoring Activities:** There were numerous outputs and services provided on the GMNF during FY 2009. These outputs are displayed in Table 2.1-2 Estimated and Actual Outputs Achieved in Fiscal Year 2009.

**Evaluation and Conclusions**: Many resource areas provided close to the estimated amount of outputs and services. A number of resource areas achieved more per year than estimated including: heritage acres inventoried, sites monitored and new sites identified; acres inventoried for Threatened, Endangered and Sensitive Species (TES); stream and lake habitats restored; and local roads maintained. Over-reaching the estimates will benefit the maintenance, improvement and protection of these resources.

**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.

**Table 2.1-2 Estimated and Actual Outputs Achieved in Fiscal Year 2009**
**Forest Plan Appendix D, Proposed and Probable Practices**

| Activity or Practice | Unit of Measure | Estimated Amount (Decade 1)* | Actual Amount Achieved in FY09 | Actual Amount Achieved since 2006 | Average amount achieved per year Since 2006 |
|---|---|---|---|---|---|
| **Heritage Resource Protection** | | | | | |
| Inventoried Acres | Acres | 2,000 to 4,000 | 11,725 | 33,040 | 11013.3 |
| New Sites Identified | Sites | 10 to 40 | 20 | 85 | 28.3 |
| New Sites Evaluated | Sites | 2 to 7 | 1 | 1 | .33 |
| Sites Monitored | Sites | 30 to 60 | 40 | 140 | 46.67 |
| **Recreation Resources** | | | | | |
| Trail Improvement | Miles | 10 to 20 | 0 | 14 | 4.67 |
| Trail Rehabilitation | Miles | 200 to 400 | NA | 0 | 0 |
| Trail Maintenance | Miles | 9,050 | 240 | 732 | 244 |
| Wilderness Managed** | Areas | 30 to 50 | 4 | 9 | 3 |
| **Roads Management** | | | | | |
| Rights-of-Way Acquisition | Rights-of-Ways | 40 | 0 | 2 | .67 |
| Maintain Local Roads | Miles | 100 to 200 | 92.6 | 260.7 | 86.9 |
| Restore Local Roads | Miles | 10 to 20 | 9.9 | 10.2 | 3.4 |
| Reconstruct Local Roads | Miles | 5 to 10 | 0 | 0 | 0 |
| Construct Local Roads | Miles | 0 to 5 | 0 | .1 | .03 |
| Maintain Arterial and Collector Roads*** | Miles | 40 to 80 | 0 | 47.86 | 15.95 |
| Decommission Local Roads | Miles | 5 to 10 | 1.5 | 7.45 | 2.48 |
| **Vegetation Management** | | | | | |
| Hardwood Selection Cuts | Acres | 8,366 | 264 | 505 | 168.33 |
| Hardwood/Oak Shelterwood Regeneration | Acres | 11,496 | 65 | 133 | 44.33 |
| Hardwood/Oak Shelterwood Removal | Acres | 3,240 | 17 | 54 | 18 |
| Hardwood Clearcut | Acres | 2,376 | 0 | 15 | 5 |
| Hardwood/Oak Thin | Acres | 9,000 | 157 | 300 | 100 |
| Hardwood Stand Improvement | Acres | 2,650 | 60 | 140 | 46.67 |
| Softwood Shelterwood Regeneration | Acres | 2,814 | 0 | 32 | 10.67 |
| Softwood Selection | Acres | 1,444 | 0 | 138 | 46 |

**Table 2.1-2 Estimated and Actual Outputs Achieved in Fiscal Year 2009**
**Forest Plan Appendix D, Proposed and Probable Practices**

| Activity or Practice | Unit of Measure | Estimated Amount (Decade 1)* | Actual Amount Achieved in FY09 | Actual Amount Achieved since 2006 | Average amount achieved per year Since 2006 |
|---|---|---|---|---|---|
| Cuts | | | | | |
| Softwood Clearcut | Acres | 10 | 0 | 2 | .67 |
| Softwood Thin | Acres | 1,000 | 0 | 2 | .67 |
| Softwood Stand Improvement | Acres | 700 | 150 | 193 | 64.33 |
| Softwood Planting | Acres | 350 | 0 | 0 | 0 |
| Release Softwood from Hardwoods | Acres | 1,700 | 23 | 23 | 7.6 |
| Clearcut Hardwoods for Softwoods | Acres | 90 | 0 | 0 | 0 |
| Plant Softwoods for Conversion | Acres | 500 | 0 | 0 | 0 |
| Clearcut Aspen | Acres | 146 | 0 | 0 | 0 |
| Clearcut Hardwoods for Aspen Regeneration | Acres | 725 | 37 | 52 | 17.33 |
| Total Selection Cuts | Acres | 9,810 | 264 | 643 | 214.33 |
| Total Shelterwood Regeneration | Acres | 14,310 | 65 | 165 | 55 |
| Total Shelterwood Removals | Acres | 3,240 | 17 | 54 | 18 |
| Total Clearcut | Acres | 3,347 | 37 | 54 | 18 |
| Total Thin | Acres | 10,000 | 157 | 314 | 104.67 |
| Total Stand Improvement | Acres | 3,350 | 210 | 435 | 145 |
| Total Release | Acres | 1,700 | 23 | 23 | 7.67 |
| Total Planting | Acres | 850 | 0 | 29 | 9.67 |
| Hardwood Sawtimber Cut | MMBF | 110 | .9562 | 2.3052 | 0.7684 |
| Softwood Sawtimber Cut | MMBF | 10 | .413 | 1.272 | 0.4240 |
| Combined Sawtimber | MMBF | 120 | 1.369 | 3.577 | 1.1923 |
| Hardwood Roundwood Cut | MMBF | 41 | 1.049 | 2.698 | 0.8993 |
| Softwood Roundwood Cut | MMBF | 3 | .317 | 0.824 | 0.2747 |
| Combined Roundwood | MMBF | 44 | 1.366 | 3.521 | 1.1737 |
| Total Timber Cut | MMBF | 164 | 2.735 | 7.098 | 2.366 |
| Monitor condition of sites and species under special forest product permits | Sites | All | 4 | 13 | 4.3 |

**Table 2.1-2 Estimated and Actual Outputs Achieved in Fiscal Year 2009 Forest Plan Appendix D, Proposed and Probable Practices**

| Activity or Practice | Unit of Measure | Estimated Amount (Decade 1)* | Actual Amount Achieved in FY09 | Actual Amount Achieved since 2006 | Average amount achieved per year Since 2006 |
|---|---|---|---|---|---|
| **Rare or Outstanding Ecological Resources** | | | | | |
| Monitor known rare or outstanding ecological, biological, or geological features | Sites | All (129+) | 14 special areas monitored | 47 | 15.67 |
| Inventory for TES species and rare or outstanding natural communities | Acres | 4,000 | 110 acres inventoried for rare or outstanding natural communities 854 acres of forested stands & wildlife openings surveyed for TES plants. | 2091.7 | 697.23 |
| Prepare conservation plans for each rare or outstanding area | Sites | 20 | 0 | 0 | 0 |
| Establish RNAs | Sites | 2 | 0 | 0 | 0 |
| **Wildlife, Fisheries, and Rare Plant Resources** | | | | | |
| Protect known occurrences of TES species | Sites | All | All | All | All |
| Protect, and where feasible, improve or restore habitat conditions for TES plants, and for TES animals of riparian and wetland habitats. | Sites | All | All | All | All |
| Protect important habitat sites for TES bats | Hibernacula | All hibernacula | All | All | All |
| Protect important habitat sites for TES bats | Roost and den trees | Adequate numbers of roost and den trees | 20 sites | 21 sites | 7 sites |
| Protect nesting TES bird species from disturbance | Active nest sites | All | All | All | All |

**Table 2.1-2 Estimated and Actual Outputs Achieved in Fiscal Year 2009 Forest Plan Appendix D, Proposed and Probable Practices**

| Activity or Practice | Unit of Measure | Estimated Amount (Decade 1)* | Actual Amount Achieved in FY09 | Actual Amount Achieved since 2006 | Average amount achieved per year Since 2006 |
|---|---|---|---|---|---|
| Monitor known occurrences of TES species | Sites /Populations | All | 11 | 455 | 151.67 |
| Update conservation assessments for RFSS | Species | All | 0 | 0 | 0 |
| Oak Released from Hardwoods, and Oak and Oak-Pine Habitat Restored/Improved | Acres | 2,000 | 0 | 0 | 0 |
| Mow Upland Wildlife Openings | Acres | 2,000 | 842 | 1988 | 662.67 |
| Non-Commercial Clearcutting of Aspen and Paper Birch | Acres | 2,000 | 20 | 140 | 46.67 |
| Burn Upland Wildlife Openings | Acres | 5,000 | 50 | 385 | 128.33 |
| Burn Marshes | Acres | 250 | 0 | 0 | 0 |
| Other Wildlife Habitat Improvement | Acres | 250 | 300 | 524 | 174.67 |
| Stream Habitat Restored/improved | Miles | 50 | 9 | 22 | 7.33 |
| Lake Habitat Restored/Enhanced | Acres | 10 | 27 | 79 | 26.33 |
| Fish Habitat Monitored | Sites | 80 | 8 | 23 | 7.67 |
| Fish Passage Restored | Road Crossing | 10 | 1 | 2 | 0.67 |

Notes: * These numbers represent the sum of annual activities in years 1 through 10.
** Wilderness Managed to Standard
*** Town jurisdiction roads accessing GMNF land maintained through road cooperative agreements

**Evaluation Question**:
How do actual outputs compare to those projected in Forest Plan Appendix D, Proposed and Probable Practices, specific to timber offered and sold?

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

**Monitoring Driver**: A quantitative estimate of performance comparing outputs and services with those projected by the 2006 Forest Plan.

**Background**: See FY08 M&E Report.

**Monitoring Activities**: Forest Activity Tracking System (FACTS) was used to monitor timber offered and sold along with the type of timber harvesting practices used to implement the Forest Plan.

**Evaluation and Conclusions**: The GMNF staff offered and sold 4.746 million board feet (MMBF) or 7,681 hundred cubic feet (CCF) of sawtimber and pulpwood in FY 2009, roughly 19-24% of the Forest Plan Allowable Sale Quantity (ASQ) annual average of 38,789 CCF (19.7 MMBF). ASQ is the maximum amount of timber volume that may be offered and sold during Decade 1, expressed on an annual basis.

**Recommendations**: Continue to monitor. Although the amount of timber offered remains well below the maximum one third of the way through, one cannot conclude that the timber offered will not meet the decadal ASQ. As such, the GMNF staff will continue to monitor the sale of timber and pulpwood, as well as looking at ways to become more efficient in reducing unit costs. For FY 2010, GMNF staff plans to offer five timber sales of various sizes along with firewood permits for a total of roughly 5.3 MMBF (8,800 CCF). Three planned timber sales will involve use of Stewardship Contracts as a way to implement the timber and wildlife work.

Proposed and probable harvest management practices:

**Table 2.1-3: Estimated Management Practices, Annual Acres for Decade 1 and FY 2009**

| Estimates of Management Practices | Annual Acres in Decade 1 Acres | Acres Completed FY 2009 | % of Annual Acres |
|---|---|---|---|
| Even-aged Regeneration Harvest | 1,750 | 87 | 4.9 |
| Even-aged Intermediate Harvest | 1,324 | 217 | 16.3 |
| Uneven-aged Harvest | 981 | 203 | 40.6 |
| Total Harvest | 4,055 | 507 | 12.5 |

**Evaluation Question:**

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

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

**Monitoring Driver**: Documentation of costs associated with carrying out the planned management prescriptions as compared with costs estimated in the Forest Plan.

**Background**: See FY07 M&E Report.

**Table 2.1- 4: Fiscal Year 09 Target Accomplishments and Estimated Cost**

| TARGET ACTIVITY | AMOUNT ACCOMPLISHED | ESTIMATED COST |
|---|---|---|
| Inventory and Monitoring | | |
| Annual monitoring requirements completed | 16 items | $198,781 |
| Inventory data collected or acquired to standard | 34,295 acres | $140,805 |
| Forest Planning | | |
| Amendments Underway | 1 | $48,426 |
| Facilities | | |
| Forest administrative and other facilities maintained to standard | 20 facilities | $190,092 |
| Recreation sites managed to standard | 101 sites | $64,309 |
| Hazardous Fuels | | |
| Treated to reduce the risk of catastrophic wildland fire | 6,208 acres | $115,693 |
| Lands | | |
| Land Acquisitions/adjustments | 17 acres | $149,323 |
| Boundaries marked | 17 miles | $123,896 |
| Non Recreation Special use permits administered to standard | 44 permits | $65,160 |
| Non Recreation Special use applications processed | 16 applications | $64,295 |
| Rights Of Way acquired | 1 easement | $5,000 |
| Vegetation and Watershed | | |
| Forest vegetation established | 441 acres | $60,000 |
| Timber stand & genetic tree improvement | 173 acres | $35,873 |
| Treated annually for noxious weeds and invasive plants | 2,186 acres | $72,407 |
| Range land vegetation improved | 1,366 acres | $38,675 |
| Soil and Water resource acres improved | 58 acres | $50,730 |
| Wildlife, Fish and Threatened, Endangered and Sensitive Species | | |
| Lake habitats restored or enhanced | 32 acres | $62,654 |
| Stream habitats restored or enhanced | 115 miles | $214,225 |
| Terrestrial habitats restored or | 1120 acres | $365,569 |

| Table 2.1- 4: Fiscal Year 09 Target Accomplishments and Estimated Cost | | |
|---|---|---|
| enhanced | | |
| Range | | |
| Grazing allotments managed to 100% standard | 4,882 acres | $71,546 |
| Recreation | | |
| Heritage assets managed to standard | 39 assets | $28,980 |
| Recreation site capacity operated to Standard | 443,580 PAOT days | $261,537 |
| Number of interpretive and conservation education plans implemented | 1 Plan | $46,645 |
| Recreation special use authorizations administered to standard | 20 permits | $90,009 |
| Trails improved to standard | 0 miles | $0 |
| Trails maintained to standard | 250 miles | $260,6320 |
| Wilderness Areas managed to standard | 4 areas | $73,527 |
| Roads | | |
| Roads decommissioned | 1.5 miles | $5,000 |
| High clearance roads maintained | 26 miles | $70,000 |
| Passenger car roads improved | 9 mile | $340,000 |
| Passenger car roads maintained | 69 miles | $245,000 |
| Lands covered by motor vehicle use map (MVUM) – includes development of the GM MVUM | 16,212 acres | $28,586 |
| Timber | | |
| Timber volume sold | 7776 ccf | $314,196 |

**Monitoring Activities**: Table 2.1-4 displays the targets that were achieved on the Green Mountain and Finger Lakes National Forests in 2009, and the estimated cost for achieving that target. Information is presented as a collective report for the Green Mountain and Finger Lakes (GMFL) National Forests for FY09 as the information is tracked regionally in a combined report.

**Evaluation and Conclusions**: Tracking costs of Forest Plan implementation activities will provide 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. This will enable managers to make more informed decisions about the costs of management activities.

**Recommendations**: Continue to track Forest Plan implementation achievements and estimated costs to develop trend information, and improve efficiency and effectiveness.

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

**Monitoring Driver**: Forest Plan Management Area Guidance

**Background**: See FY07 M&E Report.

**Monitoring Activities**: A number of projects implemented in 2008 were reported to have clearly moved toward meeting Forest Plan Objectives and DFCs for management areas. These projects are:

- Trail Flood Damage Repairs
- American Chestnut Restoration
- Sucker Pond Improvement Project
- Devil's Den Dump Clean-up
- Turnpike Timber Sales
- Moses Pond Timber Sale
- Dutton Brook Large Woody Debris Placement
- Somerset Road Apple Tree Release and Maintenance Project
- New England Wilderness Act Road Restoration Hand Removal of Culverts
- Roaring Brook Road (FR 264) Bridge Replacements
- Research and monitoring project Coordination

**Evaluation and Conclusions:**

1. Trail Flood Damage Repairs
   In August of 2008, record rainfall produced some of the most severe storm damage seen on the GMNF in many years. Many roads, bridges, trails, recreation sites, and watersheds were damaged. The heaviest amount of damage occurred on the north part of the forest, primarily in the towns of Goshen, Ripton, Rochester, and Hancock. Several projects were implemented in 2009 to repair damage to the GMNF trails and implement the 2006 FP by providing a diverse range of high-quality, sustainable recreation opportunities, and providing a safe, efficient, and effective Forest transportation system. These projects included: trail maintenance activities to repair waterbars, the trail surface tread, and the rock staircase along the 100 foot trail section on the Burnt Hill Trail; a trail re-route to enable a stream crossing that utilizes stepping stones in lieu of replacing the bridge on the North Branch Trail; trail maintenance activities to repair the waterbars and the trail surface tread on the Abbey Pond Trail; and removal of flood deposited gravel that buried a bridge on the Pine Brook Trail.
2. American Chestnut Restoration
   Approximately 650 American chestnut seedlings were planted in June 2009 in Dutton Brook II Sale Units. This project will provide important information on the cold tolerance of seed sources, and the influence of overstory silvicultural treatments on the growth, carbohydrate relations, cold tolerance and winter injury of chestnut seedlings for the future reintroduction of the American chestnut to northern forests.
3. Sucker Pond Improvement Project
   This project was designed to restore sites on and adjacent to the lake shore and within the Town of Bennington ownership that are heavily impacted by off-road vehicles (ORV's) and all terrain vehicles (ATV's); and remove an abandoned car on NFS land.. The Sucker Pond

Improvement Project involved a three-way partnership with the State of Vermont Department of Environmental Conservation (VT DEC), the Bennington County Conservation District (BCCD) and the USFS which removed the abandoned car, closed the short woods road, transplanted small saplings and shrubs from NFS land near the site, and replanted them in the heavily impacted areas to restore riparian vegetation.

4. Devil's Den Dump Clean-up
   Items were removed from the dump site including car and truck tires, old furniture, household appliances and ordinary household trash. The site is approximately 1/4 acres in area and has a grade of 30-40%. The dump site clean-up implemented the 2006 FP by protecting and preserving the riparian ecosystem around the dump site, and restoring degraded soils and natural soil processes.
5. Turnpike Timber Sale
   The sale involved individual tree and group selection harvest treatments on approximately 67 acres to regenerate a new stand in Stand 18 Compartment 43 along FR 54 in the Town of Ripton; to release existing advanced regeneration of sugar maple, yellow birch, and white ash; and reduce the net loss of timber volume per acre by capturing the economic value of the timber.
6. Moses Pond Timber Sale
   This project involved 138 acres of both hardwood and softwood in the town of Weston. Treatments included thinning (95 acres), shelterwood with reserves (27 acres), and individual tree selection (16 acres). The project will provide early successional wildlife habitat and improve the timber stand.
7. Dutton Brook Large Woody Debris Placement
   For this project, large woody debris (LWD) was placed in Dutton Brook to restore stream functions and processes, and improve aquatic habitat. This project restored habitat to: store, sort, and distribute sediment; create habitat features such as pools and riffles; add habitat diversity; provide cover; and trap and retain organic matter that is consumed by aquatic organisms and add nutrients to the aquatic ecosystem. LWD was placed in Dutton Brook upstream of Forest Trail (FT) 257 for approximately 1100 feet to accomplish this restoration.
8. Somerset Road Apple Tree Release and Maintenance Project
   Small areas were cleared around individual apple trees and around the Somerset Schoolhouse to implement a 2006 FP objective to manage mast-producing species (including apples) where practical. Release and maintenance of apple trees is a continuing component of the management activities of the Wildlife Program. This project also contributed to the accomplishment of heritage resource objectives by providing protection and stewardship for significant heritage resources on the GMNF. Some of the apple trees that were released were in close proximity to the Somerset Schoolhouse. At the same time that apple trees were released, encroaching vegetation was removed from around the schoolhouse, opening the building up to sunlight and air, which will help to protect the structure. This project was accomplished with volunteers and partners working with GMNF staff.

*Vermont Youth Conservation Corps Removing a Culvert from Wilderness*

9. New England Wilderness Act Road Restoration Hand Removal of Culverts
   The purpose of this project was to address non-conforming infrastructure, specifically roads and road culverts in newly created Wilderness on Forest Roads 39B, 39C and 61A which are not consistent with the 1964 Wilderness Act or 2006 FP. This project is restoring long-term natural processes that reduce erosion and sedimentation by removing and stabilizing road features such as culverts and ditches. Completing this project improved natural conditions for fisheries and invertebrate habitat by restoring long-term natural surface water flows that affect streams, wetlands and riparian areas.
10. Roaring Brook Road (FR 264) Bridge Replacements
    Five bridges that were in poor condition, including one bridge that had collapsed into the brook causing the road to be closed, were replaced with laminated timber superstructures on concrete abutments. The new bridges were placed in the same location as the existing bridges. This project helps to achieve the Forest Plan goal to "provide a safe, efficient and effective Forest transportation system…"
11. Research and Monitoring Project Coordination
    The following research and monitoring projects from off-Forest institutions or agencies were approved and allowed to move forward on the GMNF in 2009:

| Table 2.1- 5: Research and Monitoring Projects Approved in Fiscal Year 07 | |
|---|---|
| **Project** | **Lead(s)** |
| Soil Carbon and Other Quality Indicators in Managed Northern Forests | UVM and Vermont Department of Forests, Parks and Recreation |
| American Chestnut Cold Hardiness Trials and Research and Restoring American Chestnut to the Northern Forest | Northern Research Station (NRS) and UVM |
| Establishment of a Butternut (*Juglans cinerea*) Clone Banks on Green Mountain and Finger Lakes National Forests | USFS Eastern Region, NRS and UVM |
| Effects of Forest management on Polemonium vanbruntiae (Appalachian Jacob's Ladder) | UVM |

Research projects are located in several management areas. These projects contribute to the "best available science" related to forest ecosystem management. The best available science may have future management implications for specific management areas, the forest, and the broader state or regional area

**Recommendations**: Continue management activities that improve the DFC for all MAs and are designed to reach plan objectives. Look for opportunities to increase Forest Plan implementation in all MAs. Continue to monitor progress in reaching DFCs.

**Evaluation Question:**

Are standards, guidelines, and mitigation measures being implemented on projects consistent with Forest Plan and project NEPA direction? Are these measures effective at achieving the desired results? Are there other measures that could be more effective?

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

**Monitoring Driver**: Forest Plan Standards and Guidelines

**Background**: See FY07 M&E Report.

**Monitoring Activities**: S&Gs, design criteria and mitigations are monitored to determine if they are being implemented correctly; and, if implemented correctly, are these measures achieving the desired results. Monitoring for compliance with S&Gs, design criteria, and mitigation measures is done by individual resource specialists in areas where there could be an impact to a resource. The GMFLNF Monitoring and Evaluation Team continued the process for interdisciplinary Forest Plan implementation field monitoring of projects in 2009. Four projects were monitored: a snowmobile trailhead and trail relocation, an aquatic fish passage project, a new section of the Catamount trail, and a timber sale. Each project was evaluated using a set of questions designed to answer Forest Plan implementation monitoring questions.

**Evaluation and Conclusions**: The projects monitored during the interdisciplinary field visits were found to have the Forest Plan S&Gs and project mitigations implemented and effective most of the

time. There were also some improvements that could be made that were noted and discussed by the interdisciplinary team.

Snowmobiles were using the road rather than the new trail which could be improved with better signage and more communication with the local snowmobile club. It was suggested the trail's waterbars could be closer together and better angled to improve implementation of soil and water S&Gs. A gate that was designed to prevent access through a deer wintering area had been installed in the wrong place.

*Lake Brook Aquatic Passage Project*

The bank adjacent to the Lake Brook aquatic passage project could have been blended with the rest of the stream bank better and vegetation re-establishment on the bank slopes was limited. A few resource areas had particular concerns about some aspects of the project. For wildlife: the erosion mat could be improved in the future for snakes, and amphibians; they tend to get caught in the type of matting used in this project. For timber: there is no longer any access for timber to areas with suitable lands. For visuals: adding other vegetation such as trees would improve the projects appearance. It was also noted that the silt fencing only remains on part of the streambank. The interdisciplinary team recommended: fish and wildlife staff inspectors work with the operators and crew during installation and monitoring the slope re-vegetation over time to see how quickly it fills in and consider some other types of plantings in a few years.

Some mitigations for the timber sale were noted as being quite effective. Based on seeing past results of skidding (and some modern recreation uses) along historic travelways, the decision to move the landing contributed significantly to preserving the historic sense-of-place characteristic of that road and neighborhood -- i.e., the scale and condition of the corridor, presence of the stone walls, etc. The stone wall mitigations were implemented. The FS archeologist believed that the benefit off-set any downside to the larger size opening that in some ways might actually echo the 'open' historic landscape. It was also noted that good wildlife cavity trees were retained.
The timber sale project implementation did not follow the guidelines for visuals related to the level of retention along a trail, and there were also concerns about the proximity of the slash to the trail. The ditch along the road went directly into a small stream. Implementation of this S&Gs may have been improved by using hay bales or silt fence in the ditch or by creating a turn-out to provide overland flow before the stream. The mitigation to restore the trail to pre-sale conditions was not followed: the waterbars were large and deep, and a berm was erected at the beginning of the trail along the road that impedes accessibility.

**Recommendations**: Develop implementation plans between the NEPA documentation and doing a project. Carry mitigations from NEPA and Plan S&Gs into an operating plan in the Agreements. Have a better project hand off process with the partners. Continue and improve the process for an interdisciplinary team to monitor the implementation of S&Gs, design criteria and mitigations

through annual field monitoring and evaluation days. Continue to track the effectiveness of S&Gs, and make adjustments, when needed, to improve the performance of a standard or guideline.

**Evaluation Question:**
Did any project require guideline deviation or a Forest Plan amendment to modify a standard? If so, what was the project? Which standard was changed or which guideline required deviation? What was the rationale for the change or deviation?

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

**Monitoring Driver**: Forest Plan Standards and Guidelines

**Background**: See FY07 M&E Report.

**Monitoring Activities**: There were no amendments made to the Forest Plan and no known deviations from guidelines in 2009.

**Evaluation and Conclusions**: Not Applicable

**Recommendations**: None.

# Recreation

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

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

**Monitoring Driver**: Forest Plan Goal 12 and Objectives

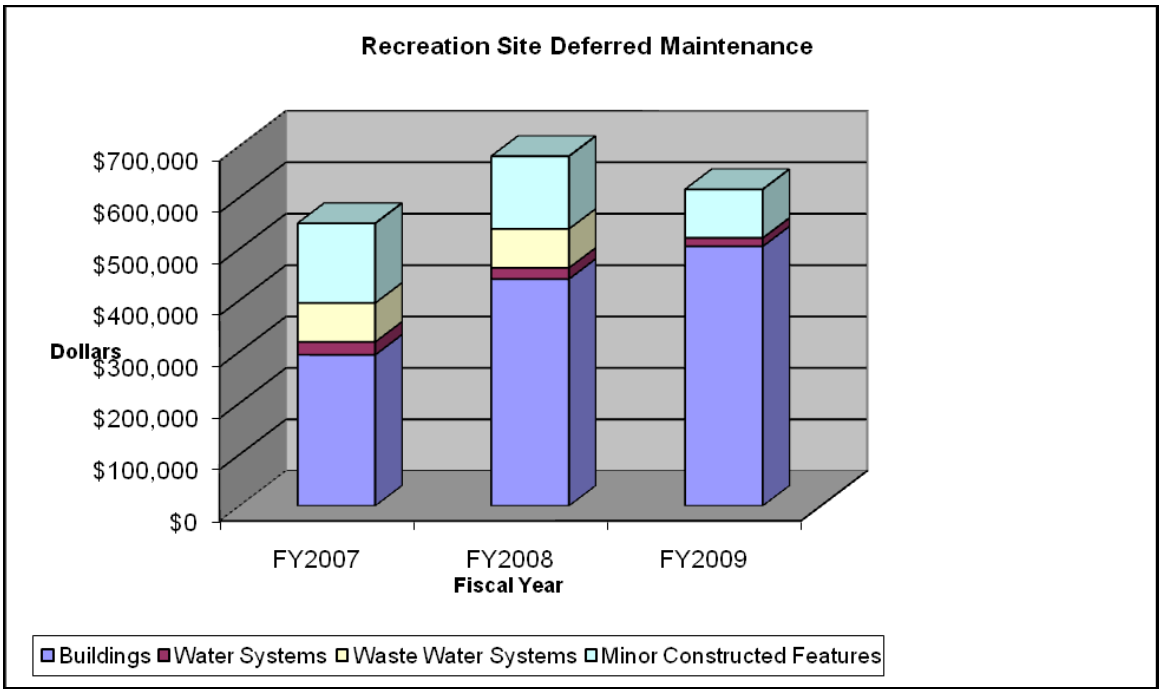
**Background**: The GMNF has a great diversity of recreation facilities, and like most National Forests, has a limited budget to operate and maintain all the sites. The Forest has a number of partners that contribute to a portion of the maintenance but this has not been sufficient to meet long term needs. With a desire to provide high quality recreation we need to monitor to determine if the management of our recreation facilities is being improved. The recreation site monitoring that we are using began in FY99 as a result of Congressional direction regarding deferred maintenance reporting. The GMNF has continued to complete annual monitoring and data clean up since that time. During the first years of this process we were required to sample approximately 20% of the facilities in any given year. The GMNF has continued this schedule and the data will be used for Forest Plan monitoring through the life of this plan.

**Monitoring Activities**: Deferred maintenance Condition Surveys were completed in FY09 using national protocols. These surveys were completed at a level sufficient to maintain our data to national standards. This monitoring was completed using Green Mountain and Finger Lakes personnel.

**Table 2.1-6 Recreation Site Deferred Maintenance**

| | FY2007 | FY2008 | FY2009 |
|---|---|---|---|
| Buildings | $293,909 | $441,304 | $504,693 |
| Water Systems | $25,085 | $21,680 | $16,275 |
| Waste Water Systems | $75,788 | $75,788 | $388 |

| | | | |
|---|---|---|---|
| Minor Constructed Features | $154,662 | $141,168 | $94,192 |
| Total Deferred Maintenance | $549,444 | $679,940 | $615,548 |




**Evaluation and Conclusions**: The protocols being used are consistent with national direction and provide very good information to answer this monitoring question. A more thorough review of recreation site data was completed in FY07 in conjunction with a comprehensive Recreation Facility Analysis. It appears the existing protocols will be adequate to maintain the GMNF data sufficient to answer this monitoring question. In the future, changes in national standards may require adjustment in monitoring procedures.

At the end of FY09 deferred maintenance for recreation facilities on the GMNF decreased $64,392 (9.5%) from FY08 and was approximately $615,548. The majority of the deferred maintenance decrease was in the Waste Water Systems and Minor Constructed Features categories of the recreation sites. The Buildings category increased by approximately $60,000 since FY08. This increase in the buildings deferred maintenance is due to the 20% schedule discussed earlier and does not account for buildings deferred maintenance projects completed in FY08.

**Recommendations**: Continue to use the existing protocols for monitoring recreation site deferred maintenance. Focus on updating the INFRA databases the same year deferred maintenance projects are completed in the field for more accurate reporting of figures.

**Evaluation Question**:
What are the trends in the illegal use of vehicles off roads?

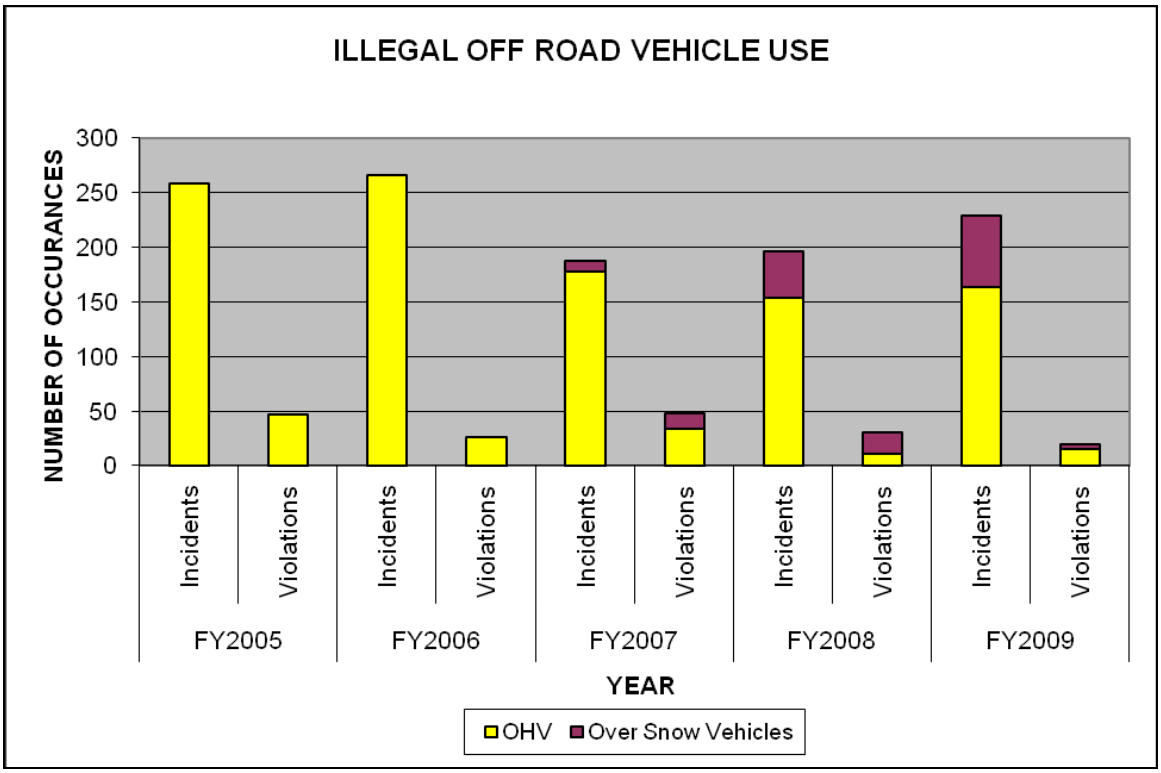
**Monitoring Question**: Is the use of vehicles off roads causing considerable adverse effects on resources or other forest visitors; how effective are forest management practices in managing vehicle use off roads?

**Monitoring Driver**: 36 CFR 295 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 uses of the National Forest System lands.

**Background**: see FY08 M&E Report.

**Monitoring Activities**: In FY08, monitoring continued in conjunction with routine law enforcement patrols. Additionally, a focused effort of trail condition monitoring was completed and incidents of illegal use of vehicles off road were also recorded. As patrols and trail condition inventories document incidents or the issuance of notices of violation, the records are recorded and entered into a database. Data are entered and stored in the Law Enforcement and Investigation Management Attainment and Reporting System (LEIMARS). Retrieved data can be used to show some trends, though there are some limitations since the data is dependent on the availability of personnel.

There were no site specific analyses completed in FY09 that assessed the existence of illegal off road vehicle use in a project area.




**Evaluation and Conclusions**: As a starting point, data entered the last five fiscal years is displayed. This shows current trends and provides 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. Starting in FY07, data has been entered to show the differences between summer off-highway vehicles and over snow vehicles.

The data shows an overall decreasing trend from FYs 05/06 to FYs 07-09. The reasons for these trends is unclear, but could be result of a decreased field presence of law enforcement personnel or a better understanding from the public due to improved education, signing and barrier control efforts. As noted earlier, an extra effort to monitor unauthorized trail uses was completed in FY08

and FY09 through trail condition inventory monitoring. The trend seems to start to decrease around the time the 2006 Forest Plan was completed where there was lots of public information and education regarding the management of off-highway vehicles during the planning process. In addition, the GMNF has been making a focused effort to include mitigation measures in all of its 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 an increasing trend in incidents associated with over snow vehicles since FY07. The Forest has increased efforts in the past two years to perform weekend snowmobile patrols on the GMNF. This increase in incidents is likely a result of the extra efforts to patrol by Forest Service staff.

**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. Add more qualitative data such as narratives based on site specific project analyses and monitoring.

**Evaluation Question**:
Is the amount of deferred maintenance on the GMNF trail system being reduced?

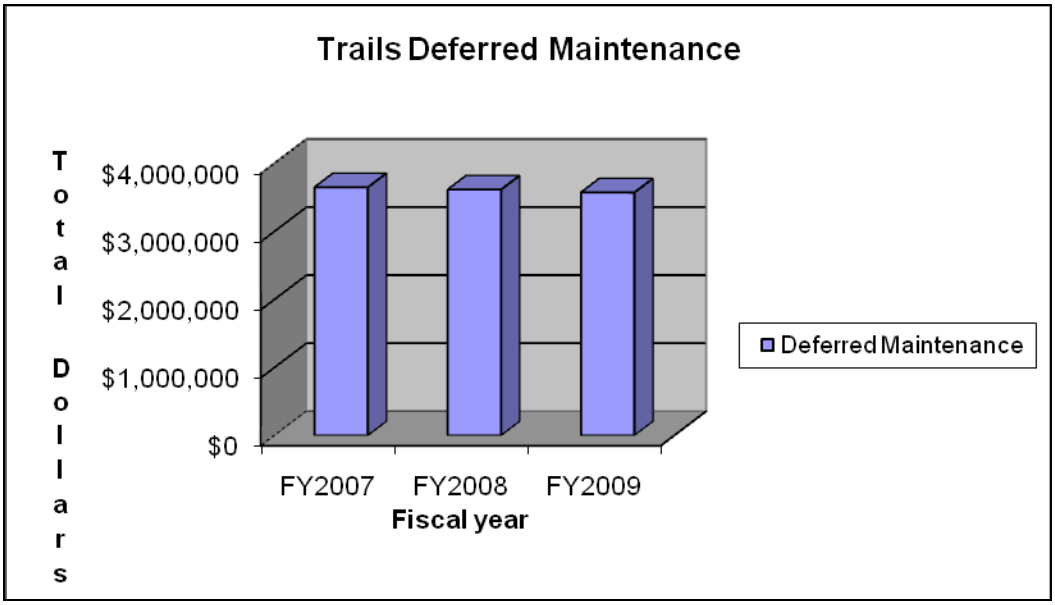
**Monitoring Question**: Is the quality of the Forest Service trail system and recreation facilities being improved through operation and maintenance?

**Monitoring Driver**: Forest Plan Goal 12 and Objectives

*Crossover Trail Bridge Construction*

**Background**: The GMFL has a large and diverse trail system, and like most National Forests, has a limited budget to operate and maintain the trails. There are many partners that contribute to a portion of the annual operation and maintenance, but this may not be sufficient to meet long term needs. With a desire to provide high quality recreation and trails, GMNF staff monitors to determine if the system is being improved. The trail system monitoring currently being used began in FY99 as a result of Congressional direction regarding deferred maintenance reporting. Some level of monitoring and data clean-up has been completed since that time on an annual basis. During the first years of the process, GMNF staff was required to sample 20% of the trail system in any given year. In the past four years this requirement has been reduced to a national sample of trails, which generally results in less than 5% of the GMNF trail system. On this schedule, it would take 20 years to monitor the whole trail system. Although the national requirement for the amount of GMNF trails has been reduced, the GMNF staff strives to accomplish additional monitoring up to 20% of the total trail system, therefore keeping the data more current.

**Monitoring Activities**: In FY09 the GMNF completed the nationally required conditions surveys on twelve trails totaling 28.2 miles. In addition, GMNF staff monitored an additional 9.7 miles of trails for a total of approximately 3.8% of the entire trail system.




**Evaluation and Conclusions**: The protocols being used are consistent with national direction and provide very good information to answer this monitoring question. In FY07 the GMNF reviewed the procedures that determine the national sample of trails relative to the Forest and found that it would be insufficient for local needs. In FY09 the Forest funded a single position for three months to monitor trails beyond those required nationally. This resulted in an additional 9.7 miles of trails being monitored beyond the required national sample on the GMNF.

The total deferred maintenance of the trails system reported in FY07 was $3,645,340 and the total deferred maintenance reported for FY09 is $3,569,455. The FY 2007 deferred maintenance figure serves as the baseline in which future years will be evaluated. The total deferred maintenance in FY09 was reduced $75,885 from FY07 or about 2%.

This reduction in deferred maintenance is likely a result of a modest amount of trail maintenance activities, but more likely the result of the increased effort to monitor and more accurately report maintenance needs in the corporate databases. The deferred maintenance number is expected to continue to decline over the next several years as the Forest continues the effort to update and correct outdated trail data and focus on targeted trail maintenance activities to reduce the backlog of maintenance.

**Recommendations**: Continue to use the existing protocols for the near-term and continue to focus on increased trail monitoring beyond what is required nationally. Increasing the amount of trail monitoring will improve the quality of the GMNF trail data for more accurate reporting of deferred maintenance. Ensure that major deferred maintenance reduction projects completed on the ground are also reported in the deferred maintenance databases in the same year.

# Wilderness, Wilderness Study Areas, and Roadless Areas

**Evaluation Question**:
To what extent has GMNF staff been in the field monitoring wilderness boundaries and providing public education and outreach?

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

**Monitoring Driver**: Forest Plan Objectives

**Background**: see FY08 M&E Report.

**Monitoring Activities**: In FY09, the Forest implemented a place-based model for wilderness management activities. In the past the forest had a single team that focused on wilderness management activities forest-wide. Wilderness management duties have been shifted to individual staff at the Districts with oversight by a Wilderness Program Coordinator in the Supervisors Office. Implementing this model has allowed more depth in the wilderness program and reduced travel burden from a single team covering the entire forest. One of the primary focuses of our wilderness education program was teaching internal staff that are transitioning duties into Wilderness management. In addition, the GMNF also completed the following outreach activities to the public.

- Boundary monitoring was completed in the Lye Brook Wilderness, Glastenbury Wilderness, George D. Aiken Wilderness, Breadloaf Wilderness and Bristol Cliffs Wilderness.
- A one-day internal workshop was conducted to provide FS employees the basic principles of Wilderness management and how to conduct and record field work.
- Wilderness staff completed updates to the annual Wilderness Education Plan.
- Staff presented Wilderness Awareness talks at Vermont colleges/ universities.
- Handed out 8 LNT Northeast LNT Booklets and introduced LNT to wildlands class after doing a Wilderness power presentation at Sterling College in Vermont.
- Led a16 hour trainer's course for 7 forest personnel.
- Front liner LNT contacts – 76 indirect and 106 direct contacts.
- Wilderness Ranger LNT field direct contacts – 118 people.
- Monitored 21 Wilderness portal signs at wilderness boundaries with system trails to check for condition inventory and vandalism.
- Nineteen Wilderness maps and information posters were monitored for condition inventory and vandalism.
- Wilderness management principles were discussed during the Upper White River Project collaboration meetings with the public and local organizations.

**Evaluation and Conclusions**: Staff spent a proportionate amount of time providing public education/outreach and boundary monitoring along with their other duties including trail maintenance, non-native invasive species surveys and treatment, campsite monitoring, etc. The program is very effective in providing this information to the public to achieve a basic understanding of Wilderness stewardship. Public education/outreach should continue to focus on areas that receive high visitor use, and in communities that received new Wilderness from the 2006 NEWA.

Monitoring Wilderness boundaries with developed (i.e. homes, camps, etc.) private lands will also continue to be a focus. Boundary monitoring of the private land inholdings within the Glastenbury Wilderness found that there are no encroachment concerns. Monitoring of the inholding in Breadloaf Wilderness showed that there may be some minor vegetation clearing encroachment on NFS lands. Monitoring of one private land/Wilderness boundary on the northern edge of the Joseph Battell Wilderness showed that there may be minor vegetation clearing encroachment on NFS lands. More boundary monitoring is needed along the northern boundary (VT 125) of the Joseph Battell Wilderness where it immediately abuts several private homes and camps.

**Recommendations**: Annually update the Wilderness Education Plan utilizing feedback received from presentation evaluations. Continue to expand wilderness education efforts to areas of high visitor use and to communities that received new Wilderness from the 2006 NEWA. Improve

uniformed field presence within the Wilderness by increasing staff and utilizing partners more effectively within the annual budget constraints.

Continue to identify and monitor high priority Wilderness boundaries, which include areas that abut private lands and areas receiving Forest Service management actions just outside of the Wilderness. Continue to work with the Lands staff to survey and mark boundaries and with law enforcement to address issues as they arise.

**Evaluation Question**:
How many wilderness areas are managed to national standards?

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

**Monitoring Driver**: Forest Plan Objectives

**Background:** During the 40th Anniversary of the Wilderness Act, the Chief of the Forest Service created the 10 Year Wilderness Stewardship Challenge (10YWSC) that identified ten key elements that help define successful wilderness stewardship. These elements are:

1) Fire managers consider a full range of responses with the goal of restoring natural fire.
2) Invasive plants are successfully treated
3) Air quality trends are measured
4) Priority actions identified in a wilderness education plan are implemented
5) Opportunities for solitude or primitive and unconfined recreation are protected
6) Recreation site inventory is completed
7) Outfitter/guides model wilderness practices and communicate appreciation for wilderness values to clients
8) Adequate direction exists to protect wilderness character
9) Information needs are met
10) A baseline workforce is in place

The 10YWSC only applies to wilderness areas that existing in 2004. The new wilderness areas designated under the 2006 New England Wilderness Act, Glastenbury and Joseph Battell, are not included in the 10YWSC. But, these wilderness areas will be managed to the same standards that are defined in the 10YWSC.

**Monitoring Activities:** During FY09, Wilderness staff focused on managing Lye Brook, Big Branch, Breadloaf and Peru Peak Wilderness Areas to national standards. Efforts to establish monitoring in the two new areas continued in Glastenbury and Joseph Battell Wilderness Areas, designated under the 2006 New England Wilderness Act (NEWA). The four focus areas (Lye Brook, Big Branch, Breadloaf and Peru Peak) met the minimum standard for Wilderness management in FY09. Activities specific to these areas include:

*Element 1* – The 2006 Forest Plan permits Wildland Fire Use (WFU) in all eight of the designated wilderness areas on the Forest. The Northeast Forests Fire Management Plan (FMP) routinely includes direction for fire suppression activities within wilderness. The management direction in 2006 Forest Plan and FMP provides fire staff the appropriate tools for addressing fire in wilderness.

*Element 2* – An invasive species plan has been written for Lye Brook, Big Branch and Peru Peak Wilderness Areas with input from the Forest Botanist/NNIS coordinator. A variety of species have been identified in high priority areas (gateways, trailheads, trails and waterways) and appropriate eradication actions have been taken. The sites treated in the past four years were monitored and

considered successful in eradicating NNIS. All occurrences of NNIS are reported using national protocols. A partnership with the University of Vermont LANDS crew was established to monitor NNIS in the Big Branch and Peru Peak Wilderness Areas in 2009.

*Element 3* – The Wilderness staff continues to work closely with the Region 9 Air Specialist to establish monitoring indicators and collect data. It was determined in FY07 that air monitoring data already being collected in the Lye Brook Class 1 Airshed can be extrapolated to the other four (Big Branch, Peru Peak, Glastenbury, George D. Aiken) wilderness areas on the Manchester Ranger District. This is based on long-term monitoring being done in and around Lye Brook because all Wilderness Areas on the south zone of the GMNF share a similar proximity, geology, physiography, vegetation and climate.

*Element 4* – A Wilderness Education Plan for all the GMNF Wilderness Areas was updated and fully implemented in FY09. Wilderness staff provided wilderness stewardship presentations both internally to Forest staff and externally to colleges and public meetings. Evaluation of the plan is on-going and modifications are made annually based on feedback and changing priorities.

*Element 5* – Wilderness staff monitor visitor use through maintaining trailhead register sheets, routine patrol and presence and by completing the National Visitor Use Monitoring project every five years. These three sources of data provide ample data to monitor visitor trends and address concerns regarding opportunities for solitude and unconfined recreation. Monitoring has shown that in general, these opportunities are being sustained in GMNF Wilderness Areas, with the exception of a few popular sites during high visitor use times (holidays, weekends). See Monitoring Question "What are the status and trends of outstanding opportunities for unconfined recreation, solitude, and primitive recreation?"

*Element 6* – A recreation site inventory continues to be annually updated and exceeds the minimum requirements of the established protocol. All campsites have been entered into the national Forest Service Wilderness database called Infra-Wild. Wilderness campsites are also being incorporated into the GMNF corporate GIS database for spatial presentation on maps. Campsite monitoring in FY09 was limited to monitoring existing sites.

*Element 7* – Wilderness staff are routinely involved in reviewing applications for recreation special use permits for appropriateness of activities within Wilderness. The staff provides valuable initial input into the application package about Wilderness specific regulations and Leave No Trace practices for prospective applicants. Monitoring permitted activities is completed to the extent possible by field staff.

*Trail Maintenance in Wilderness*

*Element 8* – The 2006 Forest Plan provides adequate direction for managing GMNF Wilderness Areas. The recently completed Forest Plan serves as the primary local management document of the eight Wilderness Areas, therefore

eliminating the need for any individual Wilderness management plans.

*Element 9* – All Wilderness management information is stored in the Forest Service corporate database referred to as Infra-Wild. Information regarding trailhead registers and field notes are recorded and stored locally for annual work planning and budgeting.

*Element 10* – Budget constraints continue to keep staff below standard for the wilderness program. Efforts are continuous to utilize volunteers and partners in assisting with wilderness management activities. In FY09 the Forest partnered with the Student Conservation Association, Vermont Youth Conservation Corps and the University of Vermont LANDS crew to perform wilderness management activities.

**Evaluation and Conclusions:** The Chief's 10YWSC has provides a national framework in which to determine adequate Wilderness management actions. The data collected in the past four years will serve as a baseline in which to compare future monitoring and data collection efforts.

**Recommendations:** For FY10, it is recommended that Wilderness staff focus on completing campsite inventories and monitoring for those wilderness areas in which they are not complete. Strongly consider increasing staff capacity through partnerships with University of Vermont, Student Conservation Association, and Vermont Youth Conservation Corps

**Evaluation Question**:
Are Wilderness Study Area Management Areas (WSA MA) being managed to maintain roadless characteristics?

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

**Monitoring Driver**: Forest Plan Management Area Guidance

**Background:** A total of 27,473 acres (7%) of National Forest System Lands were allocated as Wilderness Study Area in the 2006 Forest Plan. The GMNF has no congressionally designated Wilderness Study Areas.

On December 1, 2006 President Bush signed into law the New England Wilderness Act of 2006 (NEWA). This law designated about 42,000 acres of new wilderness on the GMNF. Approximately 26,516 acres of this wilderness was located in the WSA MA. An administrative correction to the Forest Plan was completed in FY07 to adjust the management area acreage to account for the changes due to NEWA. After completing this correction, there are 957 acres remaining in the WSA MA.

In FY08, the GMNF initiated a Forest Plan Amendment to re-designate the remaining 957 acres of WSA MA to other Management Areas in the Forest Plan. Public scoping was completed and the analysis and decision are projected to be completed in FY10.

**Monitoring Activities:** Monitoring of WSA MAs is limited to analyzing proposed actions through NEPA for activities that may be occurring within them. All activities proposed in WSA MAs were consistent with Forest Plan direction of maintaining their attributes which makes them eligible for future wilderness designation.

**Evaluation and Conclusions:** Specialists utilized FSM Interim Directive 1920-2006-1, FSH 1909.12 (Chapter 70), and Forest Plan direction to analyze each of these individual projects. It

was determined that the decisions were consistent with this management direction and maintained the roadless characteristics of the WSA MA on the GMNF.

**Recommendations**: Complete the Forest Plan Amendment to reallocate the remaining 957 acres in the WSA MA to other Management Areas. These leftover WSA MA lands are scattered in small parcels that remained after the final wilderness boundaries were drawn in the NEWA. In the interim, continue to utilize management direction to analyze the effects of individual projects and activities within the WSA MAs.

**Evaluation Question**:
What are the status and trends of inholdings?

**Monitoring Question**: To what extent is Wilderness managed to preserve its Wilderness character?

**Monitoring Driver**: Forest Plan Goal 13

**Background:** see FY08 M&E Report.

**Monitoring Activities**: Monitoring of inholdings is an important aspect of the core wilderness management program and is ongoing on an annual basis. Monitoring activities included checking property boundaries for potential encroachment onto NFS lands and access needs.

**Evaluation and Conclusions**: Monitoring showed that there are no trespass issues with inholdings within the wilderness areas. Wilderness staff continues to work closely with two landowners within the Glastenbury Wilderness to determine access needs that will be considered for a Special Use Permit authorization in FY10. The inholding with the Breadloaf Wilderness currently has access via a town road to their property. There were minor encroachment concerns regarding vegetation removal across the property boundary onto NFS lands.

**Recommendations**: Continue to annually monitor Wilderness inholdings and establish relationships with the owners so that they are aware of the uniqueness of wilderness management regulations. Continue to make acquisition of these parcels a high priority.

**Evaluation Question**:
What are the trends of selected biophysical conditions and processes sensitive to human threats? What are the trends of actions that control or manipulate the community of life in wilderness? What are the trends of human threats to natural conditions?

**Monitoring Question**: To what extent is Wilderness managed to preserve its Wilderness character?

**Monitoring Driver**: Forest Plan Goal 13

**Background:** In the past two years, the GMNF Wilderness staff has been working with the Region 9 Air Specialist to determine Air Quality Related Values (AQRV) and sensitive receptors to set a baseline for monitoring biophysical conditions sensitive to human threats. Additionally, there has been increasing interest in using the GMNF Wilderness Areas for research related to climate change.

**Monitoring Activities**: Past and current monitoring related to AQRVs includes:

- Breadloaf Wilderness – Vermont non-game Natural Heritage Program surveyed Significant Ecological Sites for threatened and endangered species. Determined the potential for Polemonium vanbruntiae (cliff-dwelling plant) occurrence.
- Breadloaf Wilderness – University of Vermont surveyed trails within the wilderness area for botanical resources and NNIS. They found only one location with NNIS present on the Wilderness boundary along the Burnt Hill Trail.
- Big Branch and Peru Peak Wilderness – Surveys in 1990 and 1992 at Big Mud Pond, Lost Pond and McGinn Brook identify several threatened and endangered species and result in classification of Lost Pond as Sensitive Habitat due to its unique bog characteristics.
- Big Branch and Peru Peak Wilderness – NNIS surveys were completed in high priority areas during 2009 by the University of Vermont LANDS crew.
- Lye Brook Wilderness – National Atmospheric Deposition Program (NADP) monitoring site located in Bennington County.
- Lye Brook Wilderness – Through a cooperative agreement with the University of Massachusetts, the Forest Service has been monitoring ozone concentration and its effects on lichens using filtered and unfiltered growth chambers at a site five miles west of Lye Brook Wilderness since 1989.
- Lye Brook Wilderness – Integrated Monitoring of Protected Visual Environments (IMPROVE) monitoring equipment (visibility) in place includes a nephelometer installed in 1992 and a particulate sampler installed in 1991, both on Mt. Equinox, which is approximately five miles west of Lye Brook.
- Lye Brook Wilderness – Background visibility monitoring with a camera installed near Branch Pond Road, just south of the Lye Brook Wilderness, sine 1986 to document background visibility from May 1 to October 30.
- Lye Brook Wilderness - The VT Department of Forests, Parks and Recreation is participating in the New England Forest health Monitoring Program, which monitors the effects of soil and air toxins on vegetation. Four one acre plots were installed near Little Mud Pond in 1990 and measurements are scheduled annually, with foliage and soil sample extractions planned every fourth year. The State intends to maintain these plots indefinitely.
- Lye Brook Wilderness - The State of Vermont has monitored water quality in Bourn Pond, which has been identified as an AQRV for this wilderness area, four times a year since 1982.
- Lye Brook Wilderness – Since 2001 the USDA-NRCS has operated a Soil Climate Analysis Network (SCAN) station near Lye Brook Wilderness. The SCAN site collects long-term data on weather, soil moisture, and soil temperature used to complement measurements of soil physical, chemical, and biological parameters at long-term soil monitoring site established nearby.

**Evaluation and Conclusions**: There is a need for all of this work to be synthesized into a format that can be easily used to monitor trends and recommend future management actions.

**Recommendations**: Continue the existing monitoring efforts. Establish a method of synthesizing and recording data so that it can be easily understood by land managers.

**Evaluation Question**:
What are the status and trends of the use of motorized equipment and mechanical transport?

**Monitoring Question**: To what extent is Wilderness managed to preserve its Wilderness character?
**Monitoring Driver**: Forest Plan Goal 13

**Background:** See FY08 M&E Report.

**Monitoring Activities:** The fisheries program, in coordination with the VT Fish and Wildlife Division, were authorized to utilize a rotor-winged (helicopter) to stock native brook trout (Salvelinus fontinalis) in Bourn Pond (Lye Brook Wilderness) and Big Mud Pond (Peru Peak Wilderness) in FY06. This stocking also occurred in FY09. As in previous years, each pond was staffed during this activity to provide education to visitors and to monitor the impact of the visitor experience.

Access to private land inholdings in Big Branch and Glastenbury Wilderness were also monitored in FY09. Access to these two parcels has traditionally been by motorized vehicles including ATVs, snowmobiles, and automobiles. Monitoring showed that the owners accessing their land are staying within their permitted access routes through Wilderness.

**Evaluation and Conclusions:** Fisheries staff stocked brook trout fry in Bourn Pond and Big Mud Pond during June 2009. Total flight time over these ponds was less than five minutes, while the total transport time over each wilderness was less than ten minutes. The time of year (early June) was originally selected to provide the least impact to Wilderness visitors (black fly season, historic low use) and was validated by staff.

Natural populations of brook trout are unable to reproduce naturally in these ponds. It is unknown whether this is a natural occurrence or due to human effects of acid deposition from air pollution.

Private land access will continue to be monitored to ensure that vehicles remain on their permitted routes through wilderness. Monitoring will also continue on the maintenance and upkeep of the access routes to the private land inholdings.

**Recommendations:** Continue to utilize the MRDG planning framework to analyze future actions with motorized and mechanized equipment. Monitor and document all authorizations in Infra-Wild database.

**Evaluation Question**:
What are the status and trends of outstanding opportunities for unconfined recreation, solitude, and primitive recreation?

**Monitoring Question**: To what extent is Wilderness managed to preserve its Wilderness character?

**Monitoring Driver**: Forest Plan Goal 13

**Background:** See FY08 M&E Report.

**Monitoring Activities**: GMNF Wilderness staff maintains fifteen trail register boxes at various trail portals to designated Wilderness Areas. Information recorded on these sheets includes date, number in party, destination, length of stay, and home town/state of visitor. Records form multiple years is available for analysis. Staff also provides a uniformed presence where they document number in groups, destinations, and wilderness messages communicated to visitor (typically LNT). GMNF staff in cooperation with the Green Mountain Club monitors groups who require special use permits to utilize National Forest wilderness.

In FY05, the Green Mountain and Finger Lakes NFs participated in the National Visitor Use Monitoring survey, which “provides reliable information about recreation visitors to National Forest

System managed lands at the national, regional and local level." Data collected includes general demographics, economics, and user satisfaction. Relevant to this specific question, an estimated 81,959 visits occurred in congressionally designated Wilderness Areas on the GMNF. Visitors were able to rate their perception of how crowded their visit felt to them.

**Evaluation and Conclusions:** The NVUM data shows that on a scale of 1 to 10, where one indicates hardly anybody is there to ten indicating a sense of overcrowding, 100% of the respondents were 5 or below. This indicates that visitor to GMNF Wilderness Areas are not feeling overcrowded, and are being provides a sense of primitive and unconfined recreation.

**Recommendations**: Continue to monitor Wilderness Areas by participating in the NVUM study. The next study will be conducted in FY10. Continue to work closely with GMC staff to evaluate the groups use system to determine the carrying capacity of recreation sites in Wilderness. Continue to monitor and screen for outfitter and guide use groups.

**Evaluation Question**:
What are the trends of physical evidence of modern human occupation or modification?

**Monitoring Question**: To what extent is Wilderness managed to preserve its Wilderness character?

**Monitoring Driver**: Forest Plan Goal 13

**Background:** See FY08 M&E Report.

**Monitoring Activities**: The GMNF Wilderness staff worked in close coordination with the GMC to maintain the Long and Appalachian Trails within the Wilderness MAs. Current infrastructure is evaluated while performing this work and only annual maintenance occurred in FY09, except for the reconstruction of Lost Pond Shelter.

Lost Pond Shelter was burned down by a suspected arsonist in 2007. It was determined to reconstruct the shelter with native materials and traditional non-motorized/mechanized methods. The shelter was reconstructed in 2009 by the Green Mountain Club and volunteers.

Staff also completed work on removing culverts on old roads that were included in the 2006 NEWA in the Breadloaf Wilderness. Vermont Youth Conservation Corps crews removed three culverts using non-motorized/mechanized methods. Of the 10 culverts determined for removal by non-motorized/mechanized methods, six have been removed by the end of 2009.

A Proposed Action for the removal of road culverts in the newly designated wilderness areas using motorized methods was put on hold in 2009 to address higher priority ARRA projects. The Forest hopes to complete this analysis in 2011.

**Evaluation and Conclusions**: The GMNF and GMC continue to work together in determining the minimum tool necessary for competing trail and shelter maintenance activities. Wilderness staff continues to monitor non-conforming road structures until a decision is made in the NEWA Road Restoration EA.

**Recommendations**: Continue to work closely with the GMC when scheduling trail and shelter maintenance activities. Complete MRDGs prior to initiating any work within Wilderness. Continue to analyze and complete the NEWA Road Restoration Project. Initiate conversations about the FS radio repeater in FY11 to determine the proper course of action.

# Eligible Wild, Scenic, and Recreational Rivers

**Evaluation Question**:
Are agency activities on eligible National Wild & Scenic Rivers consistent with the Outstandingly Remarkable Values for which the river segment was determined eligible?

**Monitoring Question**: To what extent are eligible Wild and Scenic Rivers managed to preserve their outstandingly remarkable values?

**Monitoring Driver**: Eligible Wild, Scenic, and Recreational Rivers Management Area Guidance; Wild and Scenic Rivers Act 16 U.S.C. 1271-1287, October 2, 1968, as amended 1972, 1974-1976, 1978-1980, 1984, 1986-1994 and 1996.

**Background**: see FY08 M&E Report.

**Monitoring Activities**: Although there are not any standard annual monitoring activities performed on these segments, all proposed projects and activities on the Forest must be evaluated utilized the management direction stated in the Forest Service Handbook (FSH 1909.12, Chapter 82.5-Interim Management of Eligible or Suitable Rivers). Projects may be authorized within eligible river corridors when: 1) the free-flowing character of the identified river is not modified by the construction or development of stream impoundments, diversions, or other resource projects and 2) outstandingly remarkable values of the identified river are protected.

All NEPA documentation during FY09 on the GMNF were analyzed with the above criteria.

**Evaluation and Conclusions**: Each individual project was evaluated using the above criteria and were found that they were 1) not within an eligible river corridor or 2) were consistent with FSH and Forest Plan direction.

**Recommendation**: Continue to utilize the management direction found in FSH 1909.12 and Forest Plan to analyze the effects of individual projects within these resource areas.

# Visuals

**Evaluation Question**:
Is the GMNF being managed in accordance with the Forest Plan Visuals Standards and Guidelines (S&Gs) and are the Visuals S&Gs and any additional site-specific design criteria effective in helping to meet the Visual Quality Objectives (VQOs)?

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

**Monitoring Driver**: Forest Plan Objectives

**Background**: The Green Mountain National Forest continues to provide a high quality scenic resource for residents and visitors. To some people the Forest is seen as a natural appearing visual backdrop to their particular vantage points. To others the scenery is more intimate and offers a variety of environments from ski areas, wildlife viewing areas, trailside areas, and Wilderness.

**Monitoring Activities**: The Forest Landscape Architect continues to monitor visual quality on the GMNF, using visual quality objectives (VQO's) and the S&G's set forth in the Forest Plan, with the

goal of maintaining and enhancing visual quality. In FY09 our monitoring emphasized review of the overall appearance of the GMNF and examined visual resource concerns for project planning and implementation. Forest monitoring occurred on the Moses Pond-Root Beer Ridge Timber Sale, located within the Greendale IRP (Integrated Resource Project) in the southern part of the GMNF, looking at past harvest treatments along the Root Beer Ridge Trail. In addition, the results of heavy rains and flooding on the north half of the GMNF in August of 2008 caused severe destruction and temporary closure of some of our most valued and scenic recreation sites. In 2009, site plans and construction contracts were finalized for these flood damaged sites.

**Evaluation and Conclusions**: The overall appearance of the Forest met the VQO's. however, monitoring in the Moses Pond-Root Beer Ridge Timber Sale showed that some design criteria and visual guidelines in the Forest Plan were not followed resulting in more trees being cut in a shelterwood unit along the Rootbeer Ridge Trail than was expected and desired with the visual guidance. The flood damaged sites (including Texas Falls and the Robert Frost Trail) are in need of rehabilitation to bring them back up to the level valued by the public. Construction is expected to occur during FY 2010 and 2011.

**Recommendations**: Timber sale administrators and recreation personnel should continue to work together throughout the timber harvest planning and implementation process

# Heritage

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

**Monitoring Driver**: Forest Plan Objectives

**Background**: These needs were identified in the course of Forest Plan Revision, and have been addressed incrementally since FY06-FY07.

**Monitoring Activities**: Some of the objectives were identified in the annual heritage program of work, and included in the heritage work plans. These included continued trial implementation of a State-wide GIS-based prehistoric model (unveiled in FY07), substantial Section 110 and Partnership activities, and continued work with Tribes.

**Evaluation and Conclusions**: Progress was made on all these fronts – the Vermont-wide GIS model was a useful tool in compliance work; Section 110 ("Heritage outreach") activities were numerous, our Cost Share Agreement with the VT Archaeological Society was renewed and expanded; site evaluation backlog was addressed tangentially by improving the quality of information in our site data base ("I-Web"), contact with Tribes with vested interests on both Forests continued; and our management of historic buildings moved forward on three CCC-era buildings – plans to rehabilitate the NRHP-eligible Mt Tabor garage, do heavy maintenance on the NHRP-listed Stratton Mountain Fire Lookout Tower, and rehabilitaion of the Old Job (LT/AT) Trail Shelter.

**Recommendations**: Continue with these activities and, as possible, address site evaluation, curation and historic building needs. Increase the frequency with which Tribal representatives are invited and accompanied on trips to the Forest.

**Evaluation Question**:
Have Heritage Resources across the GMNF been inventoried and protected?

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

**Monitoring Driver**: Forest Plan Objectives

**Background**: See FY07 M&E Report.

**Monitoring Activities**: Forest archaeologists conducted inventory within project areas as required by the requirements of Section 106 of the National Historic Preservation Act. They monitored the condition of 60 previously known archaeological sites across the Forest. In addition, inventory was conducted on approximately 12,000 acres of GMNF lands leading to the documentation of an additional 25 sites.

*Smith Site Archeological Excavation*

**Evaluation and Conclusions**: Comparing baseline site condition information (documented on FS site forms) with the observed condition in the field allowed us to establish that a majority of the sites were in good (or at least unchanged) condition, but that numerous sites also would benefit from on-site vegetation management to mitigate the effects of encroachment.

**Recommendations**: Continue inventory and monitoring activities, and make the monitoring effort more formal and rigorous.

**Evaluation Question**:
Have Heritage Resources within the Areas of Potential Effect of Forest-sponsored projects (undertakings) been protected and managed according to our Standards and Guidelines?

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

**Monitoring Driver**: Forest Plan Objectives

**Background**: Most projects/undertakings on the GMNF have the potential to affect one or more Heritage Resource sites. Application of Standards and Guidelines, as well as project-specific Design Criteria or Mitigation Measures strives to protect these resources from disturbance or damage.

**Monitoring Activities**: Forest archaeologists monitored two projects on the Forest – the Beattie Timber Sale, and the South Road Timber Sale, both of which were components of the larger Nordic Study Area on the Manchester District. Both contained sites to be avoided, buffered, or treated during timber-related work. One site on the Beattie project and two sites on the South Road project were re-located and inspected.

**Evaluation and Conclusions**: All three sites (the remains 19th century farmsteads) were located and compared to their condition prior to the project activity. Their condition, in two cases, were unchanged as desired – a product of good Sale Administration by Forest Service personnel. The third site was part of a "stewardship" activity designed to clear away encroaching vegetation, and it, too, was in its desired condition – albeit dramatically more visible and with less associated vegetation.

**Recommendations**: Continue using and monitoring our Plan-level Standards and Guidelines, and supplementing them with project-specific Design Criteria and/or Mitigation Measures, to ensure the preservation of our cultural Heritage Resources.

# Air

**Evaluation Question**:
What is the composition of particles in the air, and how are the levels of particulates changing over time?

**Monitoring Question**: To what extent are air quality and atmospheric deposition affecting sensitive components of the forest ecosystem?

**Monitoring Driver**: Forest Plan Goals 2-8, 12 and 13

**Background**: See FY08 M&E Report.

**Monitoring Activities**: GMNF staff monitors visibility, which is an Air Quality Related Value (AQRV), in the Class I area within the boundary of the GMNF. The Class I area in the GMNF is the Lye Brook Wilderness area, as designated by the Clean Air Act Amendments of 1977.

Due to operational problems at the GMNF IMPROVE site, a complete data set for FY09 is not available and is insufficient for analysis (based on predetermined standards).

**Evaluation and Conclusions**: n/a.

**Recommendations**: Continue Air quality monitoring on the Forest for the long-term.

# Soil

**Evaluation Question**:
Were Forest Plan Standards and Guidelines (S&Gs) and mitigation measures implemented on selected projects, and to a lesser extent, were they effective in protecting the soil, water and wetland resources? Are soil quality standards met?

**Monitoring Question**: To what extent are Forest Service management and restoration activities maintaining or improving soil quality?

**Monitoring Driver**: Forest Plan Goal 3

**Background**: No change from FY08. Tree harvest activities have a high potential to impact soil, water and wetland resources, so harvesting continues to be the major emphasis of our monitoring.

Regarding the question, "Are soil quality standards being met?" Soil quality is defined as the capacity of a soil to function within ecosystem boundaries to sustain biological productivity, enhance water and air quality, and support human health and habitation. The science of setting soil quality standards is changing. National soil quality standards were abandoned in 2009, and scientists have learned that no one set of soil quality standards is applicable to all Forests, and all management activities. Emphasis is now being placed on implementing new national monitoring protocols to quantify soil disturbance at the local level. Soil disturbance monitoring results will help us establish new soil quality standards for the GMNF. Results of this monitoring will be reported in 2010.

**Monitoring Activities**:

1) Soil, Water and Riparian Resource Monitoring in Harvest Areas

Periodic visits were made to timber sale areas during and following harvest. The Snow Valley, Cone Brook West, Beattie Road, Apple Orchard and Greendale sales were monitored in 2009 by the Sale Administrator and Soil Scientist. Monitoring looked at whether measures designed to control erosion, prevent sedimentation, protect wetlands, and maintain soil and water quality, were implemented and effective. In addition, there was a special field review in May, 2009 to the Greendale and Moses Pond sales. A State AMP (Acceptable Management Practices) forester, the Forest Supervisor, soil, water, fisheries, and forest management personnel participated in this review.

2) Stream Macroinvertebrate Monitoring

At our request, each year the Vermont Department of Environmental Conservation, Water Quality Division, Biomonitoring and Aquatic Studies Section conducts marcroinvertebrate monitoring in selected streams on the GMNF. In 2009 we received the report documenting the results of biomonitoring completed in 2008. This report is available by contacting the Supervisor's Office, Green Mountain and Finger Lakes National Forests, 231 N. Main Street, Rutland, VT 05701, telephone (802)747-6720.

Twelve sites, located on nine different streams, were monitored in 2008. Eight of these sites were chosen to evaluate the effects of past or future harvest activities. Based on the monitoring data, each stream's biological integrity was determined by comparing its macroinvertebrate community composition to the VT DEC statewide database of streams in reference condition.

**Evaluation and Conclusions**:

1) Soil, Water and Riparian Resource Monitoring in Harvest Areas

Overall, the soil and water resources are being protected due to effective implementation of S&Gs and mitigation measures, good sale area layout and tree marking, and frequent monitoring by the sale administrator. Incidents of erosion, rutting and stream sedimentation are localized and of low magnitude.

Participants in the special field review concluded that soil and water resources impacts resulting from harvest activities on the GMNF, were similar to those on the White Mountain National Forest, and on privately-owned lands in Vermont.

A few points that came out of the special field review are worth noting:

- Some stream sedimentation was observed on the ditch line of a haul road for the Moses Pond Sale. To prevent further sedimentation, GMNF personnel mulched the road with straw. This action was effective in suspending the sediment.
- Wetlands are being protected maintaining vegetated riparian buffers, and keeping harvest equipment out of wetlands.
- Several in the group acknowledged the increasing use of large, tracked, mechanized harvesting machines in GMNF sale areas. These machines tend to create more soil disturbance such as rutting and compaction, but at the same time, they are a much safer way to harvest trees (as opposed to cutting trees with a chainsaw). All agreed we need to mitigate soil disturbance as much as possible during harvest operations, and when the final erosion control work is done. This will keep the impacts to soil and water resources at low levels.
- The group emphasized the need to pay careful attention to the type of stream crossing structures on skid roads. All agreed there should be less use of poled crossings, and more use of bridges. Where poled crossings are appropriate, poles need to be removed from the stream as soon as possible following use. These stream crossings recommendations were successfully implemented on the Cone Brook West Sale, at the start of the 2009/2010 winter harvest season.

Finally, the Soil Scientist visited selected harvest areas of the Greendale Sale in 2009, to check the condition of skid roads, streams and wetlands. Harvesting and final erosion control work was completed in these areas in 2008. The Soil Scientist found the skid roads were stable, well vegetated, and the water was controlled. There was no erosion or stream sedimentation. All wetlands were in good condition.

2) Stream Macroinvertebrate Monitoring

Highlights of the states' monitoring results include:

- Three sites located on Flood Brook and the Winhall River rated excellent.
- Three sites located on Red Mill Brook, Greendale Brook, and Jenny Coolidge Brook rated excellent to very good.
- Two sites located on Alder Brook and Leicester Hollow rated very good.
- One site located on Fayville Brook rated good to fair.
- Two sites, Flood Brook and Lye Brook rated fair, and only Dutton Brook rated poor.

Lye Brook rated "fair" because it is acidified due to atmospheric deposition. Dutton Brook rated "poor" due to impacts from the 2008 flood event that impacted much of the north half of the GMNF.

The one Flood Brook site that rated "fair" was located below the dam on Hapgood Pond, a popular recreational pond. Data collected over several years indicates the pond contributes fine sediment and warm water to Flood Brook below the dam, causing stress to the biotic community. Low alkalinity and elevated iron may also be causing stress. The Forest Service has tried to mitigate these problems, but with little success.

Three monitoring sites were located near active harvest areas in 2008 – Greendale Brook, Leicester Hollow Brook and Dutton Brook. The biological integrity of Greendale and Leicester Hollow rated excellent or very good. Dutton Brook rated poor, which triggered a field investigation by the Soil Scientist to determine if nearby harvest activities were the source of the low rating. No sediment from the sale area was observed reaching Dutton Brook, and riparian no-harvest buffers were in place. The poor macroinvertebare community integrity rating was due, instead, to the 2008 flood event that affected much of the north half of the GMNF.

**Recommendations**:

1) Soil, Water and Riparian Resource Monitoring in Harvest Areas. Continue similar monitoring in 2010. In addition, conduct soil disturbance monitoring using the new national protocols. Use these monitoring results to identify preliminary soil quality standards for harvest areas.

2) Stream Macroinvertebrate Monitoring. Continue similar monitoring in 2010.

# Water

**Evaluation Question**:
What is the existing status of water quality on the GMNF, and how are Forest Service management activities affecting water quality?

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

**Monitoring Driver**: Forest Plan Goal 4

**Background:** see FY08 M&E Report.

**Monitoring Activities, Evaluation and Conclusions, and Recommendations:**
See Soil Section above.

# Fish

**Evaluation Question**:
Are Atlantic salmon populations being maintained and how are salmon parr and smolt production changing over time?

8 inch Brook Trout, Utley Brook

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

**Monitoring Driver**: Forest Plan Objectives

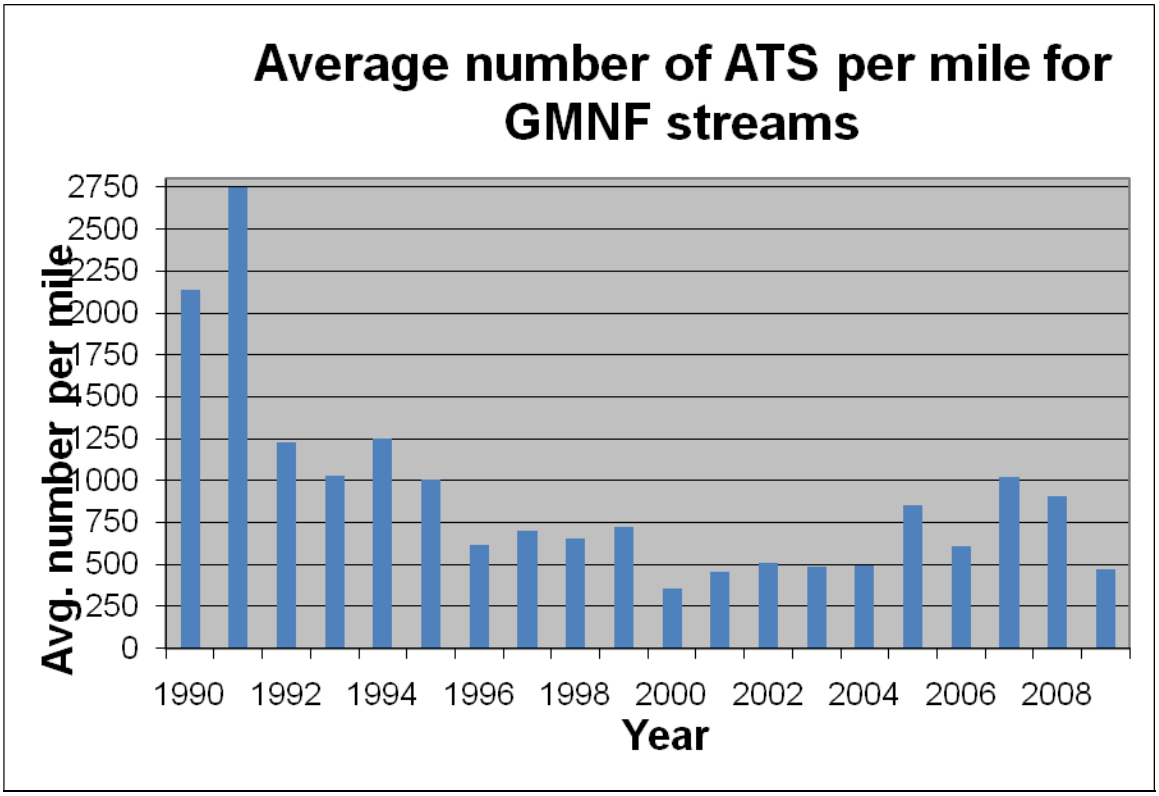
**Background**: see FY07 M&E Report.

**Monitoring Activities**: Atlantic salmon population monitoring was conducted at 19 sites in 15 streams throughout the White River and West River watersheds. Monitoring data were collected using electrofishing surveys in August and early September.

**Evaluation and Conclusions**: An evaluation of the data collected in 2009 indicates that juvenile Atlantic salmon populations in GMNF streams were lower than densities of the last 3 years. Atlantic salmon populations, like other fish and wildlife species, can change substantially from year to year. The 2009 population of 468 salmon per mile is considerably lower than the 2008 estimate of 908 per mile. Only one year (2000) in the last several were salmon densities lower than in 2009 (see

figure below). Overall, the number of juvenile salmon in GMNF streams over the past ten years has been relatively stable. This has resulted in consistent numbers of smolts emigrating from GMNF streams to the Atlantic Ocean to complete the next phase of their life cycle. These salmon would be expected to return to the Connecticut River Basin as adults in 2010.

**Average Number of Atlantic salmon per mile in GMNF streams.**




**Recommendations**: Continue to stock Atlantic salmon fry into GMNF streams and to perform annual monitoring to determine growth and survival estimates of the population.

**Evaluation Question**:
How are fish habitat and stream channels changing over time?

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

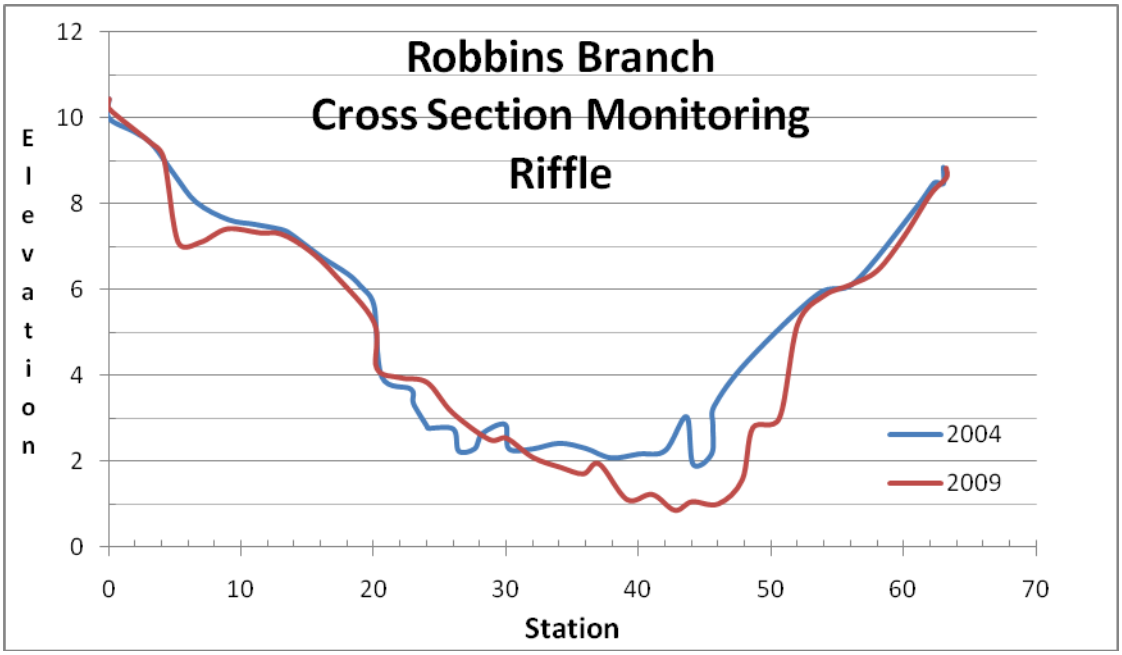
**Monitoring Driver**: Forest Plan Goal 4

**Background**: see FY07 M&E Report.

**Monitoring Activities**: In 2009, fish habitat and channel monitoring occurred in five sites on five streams. These streams included: Greendale, Griffith, Michigan, Robbins and West Branch White River.

**Evaluation and Conclusions**: A review and comparison of the 2004 and 2009 data indicate that fish habitat conditions are relatively unchanged, and stream channels are stable and within the range of natural variability for upland streams. For example, the figure below depict the riffle cross

section of Robbins Branch monitoring site in 2004 and 2009. The stream's cross section illustrates some deepening the banks have not eroded and essential unchanged over the past 5 years.




**Cross Section of Robbins Branch monitoring site in 2004 and 2009**

Other indicators of habitat quality and stability are the amount of pool habitat and fine sediment. Table 2.1-7 shows changes in pool area and fines (sand) over the past 5 years in the five streams. Under these conditions, aquatic habitat for aquatic insects and fish remains in good condition.

**Table 2.1- 7: Changes in percent pool habitat and fine sediment over 5-year monitoring period.**

| Stream | Pool Area (%) | | Percent Fines (%Sand) | |
|---|---|---|---|---|
| | 2004 | 2009 | 2004 | 2009 |
| **Griffith** | 34 | 49 | 3 | 6 |
| **Greendale** | 39 | 42 | 5 | 4 |
| **Robbins** | 31 | 35 | 7 | 6 |
| **Michigan** | 23 | 14 | 6 | 9 |
| **West Branch** | 26 | 21 | 20 | 15 |

**Recommendations**: Conduct regularly scheduled level III monitoring in FY10.

**Evaluation Question**:
Are summer temperatures in upland streams suitable to maintain native fish species and have they changed over the planning period?

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

**Monitoring Driver**: Forest Plan Goal 4

**Background**: see FY07 M&E Report.

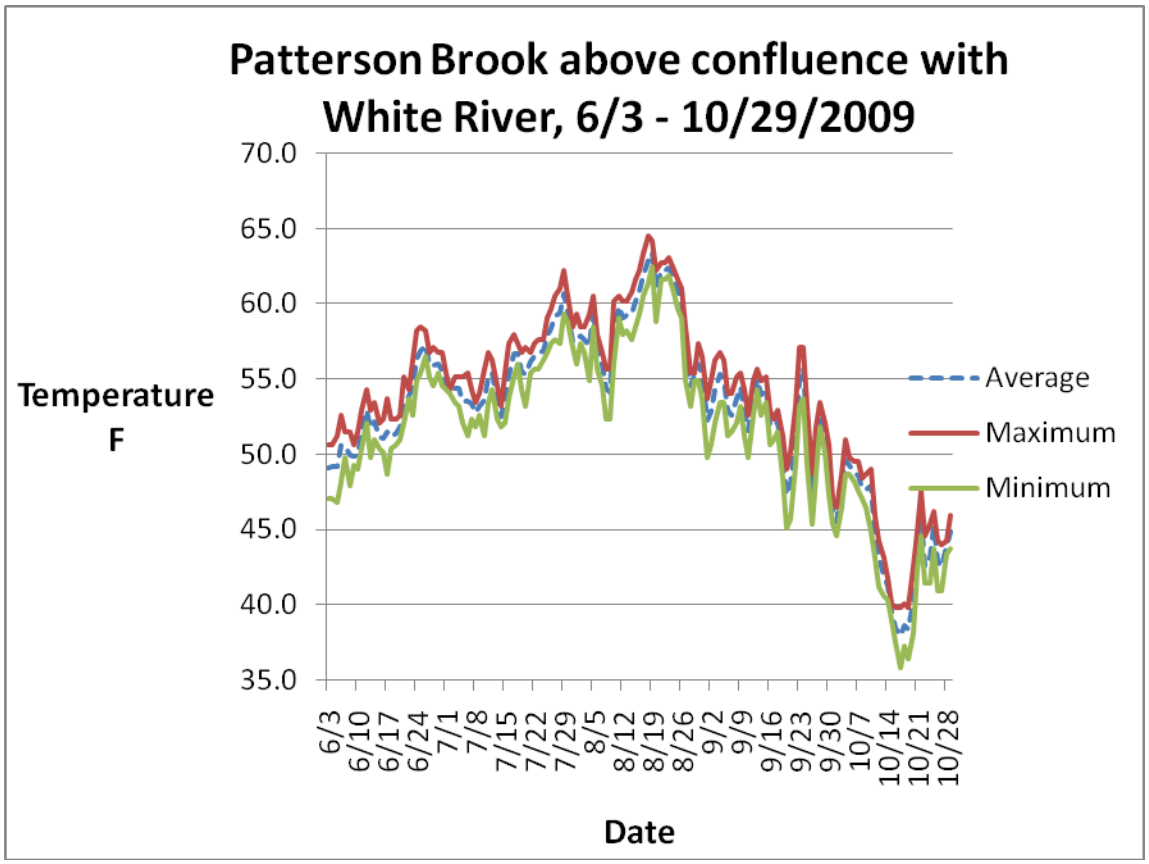
**Monitoring activities**: Stream temperature monitoring was conducted in 13 streams on the GMNF in 2008, which are listed in the table below.

**Table 2.1- 8: Stream Temperature Monitoring Locations and Maximum Temperatures.**

| Stream Name | Watershed | Date of maximum temperature | Maximum Temperature from June to October ($^0$F) |
|---|---|---|---|
| Flood Brook (above Hapgood Pond) | West River | Aug 21 | 71 |
| Flood Brook (below Hapgood Pond) | West River | Aug 21 | 72 |
| Winhall River | West River | Aug 19 | 71 |
| Mad Tom Brook | Otter Creek | Aug 21 | 65 |
| East Fork Mettawee River | Poultney River | Aug 21 | 61 |
| West Fork Mettawee River | Poultney River | Aug 21 | 61 |
| Bingo Brook | White River | Aug 18 | 69 |
| Deer Hollow Brook | White River | Aug 19 | 60 |
| Kendal Brook | White River | Aug 15-19 | 70 |
| Patterson Brook | White River | Aug 19 | 63 |
| Smith Brook | White River | Aug 18 | 64 |
| Upper White River | White River | Aug 18-19 | 62 |
| Upper White River Tributary (un-named) | White River | Aug 18-19 | 63 |

**Evaluation and Conclusions**: An evaluation of the data collected in 2009 indicates that water temperatures in the streams monitored are well within the desirable range to support healthy native fisheries and aquatic insect communities. The sites on Flood Brook and the Winhall River did experience one day in August when stream temperatures reached or exceeded an average daily temperature over 70 degrees F, an accepted threshold for cold water fish species. However, these warm periods, while possibly stressful to aquatic insects and fish, are not believed to be detrimental to stream populations since they were very short in duration. The other ten streams that were monitored in 2009 exhibited excellent temperature profiles ranging from the mid-50 to mid-60's degrees F (Fahrenheit) throughout the summer. Streams with average daily temperatures below 70 degrees Fahrenheit are not considered to be stressful for native aquatic species.

Average daily temperatures Patterson Brook between June and October 2009




**Recommendations**: Conduct water temperature monitoring on a regular basis in GMNF watersheds.

**Evaluation Question**:
Are culvert rehabilitation projects resulting in improved fish passage at stream crossings?

**Background**: See FY08 M&E Report.

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

**Monitoring Driver**: Forest Plan Goal 4, S&Gs 2.3.8 - Fisheries

**Monitoring Activities**: In 2009, several stream crossing structures (culverts) were identified as needing maintenance or replacement due to flood damage or AOP issues. All structure designs considered AOP and resulted in bottomless arches being proposed or culverts being removed. The end result of 2009 crossing evaluations will be the installation of 6 bottomless arches in 2010. The GMNF will also be a cooperator with the Norther Research Station in evaluating the effectiveness of AOP projects.

**Evaluation and Conclusions**: Replacement of undersized and perched culverts with bottomless arches will open up several miles of quality habitat to native fish and other aquatic organisms in the Middlebury, White and West River watersheds.

*20'x 13'culvert barrier on Lake Brook* *Removed culvert with restored channel*

**Recommendation**: Inventory and assess culverts throughout the GMNF and implement additional fish & aquatic organism passage improvement projects.

**Evaluation Question**:
Are substrate embeddedness and sedimentation levels within the desired range to provide high quality fish spawning habitat and rearing habitat for fish and macro-invertebrates.

**Monitoring Question**: To what extent have Objectives been attained?

**Monitoring Driver**: Forest Plan Goal 4

**Monitoring Activities**: The percent of fine sediments indicate the extent to which gravels and cobbles are surrounded (emebedded) by sand and silt that reduces insect habitat and spawning success. The GMNF staff monitored fish habitat and channel conditions in five streams during the summer of 2009 (see Evaluation Question 1 above). Stream embeddedness and sedimentation data are collected using standard stream geomorphology protocols (Level III geomorphic survey) then summarized and compared to threshold levels from the scientific literature described in the Forest Plan.

**Evaluation and Conclusions**: Substrate composition baseline monitoring was done in 2004 and repeated in 2009. In 2004 the percent fines in the five streams sampled ranged from 3-20% (See table __ above). In 2009 fines ranged from 6-15%. In 2004 the amount of fine sediment in one stream (West Branch, White River 20% fines) was at the threshold for the Forest Plan DFC of 20%. In 2009 all 5 streams were well below the DFC. Minor changes in the amount of fines indicate GMNF streams continue to provide healthy habitat for fish and macro-invertebrates.

**Recommendations**: Continue Level III geomorphic surveys to assess stream conditions.

# Wildlife

**Evaluation Question**:
Do Indiana and Eastern Small-footed bats roost, forage, hibernate on GMNF? Do they need protection or habitat management?

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

**Monitoring Driver**: Forest Plan Goal 2

**Background**: GMNF staff continues to participate in Forest-wide and State-wide, woodland bat surveys and monitoring as needed. Efforts are designed to better understand how, and where, all of our woodland bats, including the Eastern small-footed bat and the federally endangered Indiana bat in particular, use the Vermont landscape. This is a cooperative effort involving the USFWS, Vermont's Department of Fish & Wildlife, New York's Conservation Department of Environmental, University of Vermont, and numerous local volunteers.

**Monitoring Activities**: In FY09 the Green Mountain National Forest continued to cooperate with the Vermont Fish and Wildlife Department in attempts to gain more information regarding the effects of the White Nose Syndrome (WNS). Assessing the impacts to our local bat populations as the result of the WNS that had recently been found to be affecting bats within some of Vermont's known Hibernacula, became the priority. Vermont Fish and Wildlife Department began monitoring the Greeley Talc Mine, using sensors on individual bats to record body temperature to assess

winter activity levels. All aspects of the forest monitoring program are coordinated with Vermont Fish and Wildlife (VFWD) and the US Fish and Wildlife Service (USFWS).

**Evaluation and Conclusions**: No further evaluations or conclusions were made as the result of the 2008 monitoring year. The data were consistent with previous information gathered on and near our Forests western boundaries.

**Recommendations**: Continue to collaborate with the USFWS and the VFWD regarding further woodland bat survey and monitoring efforts. Our focus at this juncture is to further define the impacts and extent of WNS.

**Evaluation Question**:
Do we have bald eagles on/near the GMNF? Are they nesting? Are they nesting successfully? Do they need site-specific protection or habitat management?

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

**Monitoring Driver**: Forest Plan Goal 2

**Background**: Until 2006 there were no nesting bald eagles in the state of Vermont. The greatest potential for nesting occurs in the Champlain and Connecticut River valleys. In 2004 a group of partners including the United States Fish and Wildlife Department, Vermont Fish and Wildlife Department, and others, began hacking young eagles at the Dead Creek Wildlife Management Area in the Champlain Valley. In 2006 a pair of bald eagles was confirmed nesters in the Connecticut River Valley.

**Monitoring Activities**: Each Bald Eagle sighting is noted in the FS Database and each sighting is evaluated carefully. Follow-up actions occur, including area surveys and monitoring if necessary, to determine the status of the bird sighted. . In FY09 there were several sightings of bald eagles reported and documented in our sightings form. It continues to appear as if the sightings are of transient birds later in the nesting season. Agencies such as the US Fish and Wildlife Service and Vermont Fish and Game department monitor Bald Eagle nesting closely as do several local groups such as Vermont institute of Natural Science and Vermont Audubon.

**Evaluation and Conclusions**: Given the visibility of the Bald Eagle to the general public and to agencies tasked with tracking populations of this species, it is likely that the GMNF staff will be made fully aware of any nesting eagles located on the GMNF. If and when this happens, a more site specific analysis of the management guidelines for the area hosting the nesting pair would need to be evaluated.

**Recommendations:** No changes needed at this point.

**Evaluation Question**:
What is the population trend of Bicknell's thrush on the GMNF and adjacent lands?

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

**Monitoring Driver**: Forest Plan Goal 2

**Background**: The Bicknell's thrush, a recognized subspecies of the Gray-cheeked Thrush since 1995. The Bicknell's thrush is widespread at high elevations in the GMNF, where surveys conducted by Vermont Institute of Natural Sciences (VINS) (recently established as the Vermont Center for Ecostudies or VCE), confirmed the species' presence on 42 mountains. Most of the wintering populations of Bicknell's Thrush are found in wet, broadleaf forests of the Dominican Republic. Since 1992, VINS has studied the distribution, ecology, and conservation status of Bicknell's thrush in the northeastern United States. Similar efforts are underway in Canada.

**Monitoring Activities**: Annual monitoring of high elevation peaks occur across the GMNF by volunteers working in conjunction with the Mountain Birdwatch monitoring program organized by VCE. On the GMNF Forest Service Biologists conducted two of the surveys organized by VCE.

**Evaluation and Conclusions**: Populations of Bicknell's thrush continue to decline in the United States and on the Green Mountain National Forest. Current survey protocols are adequate in assessing the occurrence of nesting populations on the GMNF, and in conjunction with the wider effort of VINS, population trends across the region are being tracked. The Conservation Strategy completed in FY 2006 is invaluable in the guidance of management activities toward the protection and enhancement of Bicknell's habitats.

**Recommendations**: Continue to assess specific project proposals in potential Bicknell's habitat and assist VINS in their monitoring of known habitats on the GMNF.

**Evaluation Question**:
Do odonate and lepidopteron RFSS occur on GMNF? What type of habitats so they occur in? Where on the Forest do they occur? Do they need protection or habitat management?

**Background**: See FY08 M&E Report.

**Monitoring Activities**: Monitoring activities occurring in FY09 included the statewide butterfly survey activities being undertaken by the VINS.

**Evaluation and Conclusions**: It is well established that each of the RFSS Odonates occur in stream side or wetland conditions, Forest Plan standards and guidelines are in place and require careful consideration of any activities that occur in these areas. Water quality has been increasing on the GMNF as evidenced by the Fish and Stream monitoring programs. The revised forest plan has increased the protections of forested wetlands and seasonal pools, considered to be odonate prime habitat. More information is emerging about the existence of the West Virginia white as the result of the on-going atlas development of Vermont's butterflies by the VINS group of citizen scientists. As information becomes available FS staff will incorporate the data into the analysis of management actions.

**Recommendations**: Continue to monitor and document reports of species and sightings. Encourage Forest Biological staff to become more familiar with odonate and lepidopteron species.

**Evaluation Question**:
What are the population trends of wood turtle, Jefferson salamander, blue-spotted salamander, and four-toed salamander on the GMNF and adjacent lands? Do they need protection or habitat management?

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

**Monitoring Driver**: Forest Plan Goal 2

**Background**: The wood turtle, Jefferson salamander, blue-spotted salamander and four-toed salamander are all species that occur on portions of the Green Mountain National Forest and are all species on our Regional Foresters Sensitive Species List. In the past, monitoring activities associated with these species was limited to the Vermont Reptile and Amphibian Atlas Project, which collects and disseminates data needed to make informed recommendations regarding the state status, state rank, and conservation of Vermont's reptiles and amphibians. The data gathered for this atlas is collected with the help of volunteers, collaborations with conservation organizations, and staff members from Middlebury College.

**Monitoring Activities**: In addition to the valuable information we have been able to use from the Vermont Reptile and Amphibian Atlas project, the FS staff began identifying sites in 2006 to survey for reptiles and amphibians. In 2006, Forest Service staff identified sites where activities would be taking place, had taken place and sites where activities are unlikely to take place with the goal of adding to the Vermont Atlas and identifying the habitat needs and population trends of Forest Reptile and Amphibian populations. In addition, Forest Service staff conducting annual stream inventories continue to report sightings of the species mentioned above.

Forest Service biologists and technicians began conducting general site surveys for reptiles and amphibians in areas where management activities had been proposed as a priority. In subsequent years, we will expand our surveys out to areas where management activities have occurred and where management activities are unlikely to occur.

**Evaluation and Conclusions**: At this point there is little information to evaluate. The Vermont Reptile and Amphibian Atlas shows that the four species listed above are generally located on the periphery of the Forest at lower elevations. Survey and monitoring is intended to test this assumption with a more intensive survey of areas within the Forests interior, and around sites under management.

**Recommendations**: Continue to survey and monitor sites for these Regional Foresters Sensitive Species and increase the number of sites monitored each year as time and funds allow.

**Evaluation Question**:
What is the population trend of peregrine falcons on the GMNF and adjacent lands?

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

**Monitoring Driver**: Forest Plan Goal 2

**Background**: Due to the use of DDT, the peregrine was extirpated in the Eastern U.S. by the mid-1960s. The peregrine falcon was removed from the Federal Endangered Species List in 1999. In Vermont, 93 young birds were released at 3 hack sites from 1982-87: Mount Horrid, Marshfield Mountain, and White Rocks. In 1984, a territorial falcon pair reoccupied the cliffs of Mount Pisgah and returned the following year to nest successfully. The peregrine falcon continues to remain on the Regional Forester Sensitive Species list for the GMNF.

Vermont's breeding population has since increased steadily, paralleling similar trends throughout much of the eastern U. S. The Vermont Institute of Natural Science (VINS) and the Vermont Fish and Wildlife Department has closely monitored this species' recovery. In the spring of 2005, the

Peregrine Falcon was officially removed from the Vermont List of Threatened and Endangered Species

**Monitoring Activities**: Although peregrine falcons are no longer federally listed under the ESA, FS staff continues to monitor and protect their nesting eyries. Again in FY09, FS staff and volunteers surveyed and monitored four sites on the GMNF. The FS staff continues to monitor the species and populations to assist in the state-wide and national efforts of monitoring the species, and to assess the adequacy of Forest Plan guidance and the need for any additional protective measures.

**Evaluation and Conclusions**: In FY09 FS staff identified 3 territorial pairs with two of the pairs successfully reproducing and fledging young. Also in FY09 trail closures were put in place and monitored during the nesting season to reduce the impacts of forest users on nesting falcons. Vermont's Peregrine Falcon breeding population reached a new post-DDT record high of 38 territories in 2008. Trends on the Green Mountain National Forest are consistent with the state wide trends.

**Recommendations:** Continue monitoring activities in coordination with the efforts lead by VINS Citizen Science program and provide protective mitigations where they are warranted.

**Evaluation Question**:
Are Forest Plan Standards and Guidelines (S&Gs) improving the quality of softwood cover in Deer Wintering Areas (DWAs)? Are S&Gs improving availability and quality of browse in and near DWAs? Is occupancy of DWAs changing over time?

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

**Monitoring Driver**: Forest Plan Goal 2

**Background**: see FY07 M&E Report.

**Monitoring Activities**: In FY09, weather conditions and capacity issues limited the ability of Forest Service staff to complete deer yard reviews, and no surveys were completed.

**Evaluation and Conclusions**: Will be reported in the 5 year Comprehensive Evaluation Report.

**Recommendations**: Continue survey efforts and increase the amount of land area surveyed in future years. Incorporate GIS into the data gathering and analysis.

**Evaluation Question**:
Are temporary and permanent openings being used by early successional habitat (ESH) species? What are short- and long-term changes in structural components and use of openings of different sizes?

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

**Monitoring Driver**: Forest Plan Goal 2

**Background**: see FY07 M&E Report.

**Monitoring Activities**: In 2006 the GMNF identified sites where activities would be taking place, had taken place and sites where activities are unlikely to take place with the goal of identifying the

habitat uses and population trends of early successional and interior forest bird species. Forest biologists and technicians began conducting general site surveys 2007 to identify forest birds in areas where management activities are proposed as a priority. In subsequent years, surveys continue to be expanded out to areas where management activities have occurred and where management activities are unlikely to occur.

**Evaluation and Conclusions**: Will be reported in the 5 year Comprehensive Evaluation Report

**Recommendations**: Continue to survey and monitor sites for these early successional forest birds as well as other early successional species. Increase monitoring intensity and the number of sites monitored each year, as time and funds allow, by utilizing local volunteer groups and interested organizations.

**Evaluation Question**:
Do we have common loons on/near the GMNF? Are they nesting? Are they nesting successfully? Do they need protection or habitat management?

**Background**: See FY08 M&E Report.

**Monitoring Activities**: The GMNF staff relies on the monitoring efforts of Vermont Loonwatch, and supports these efforts by providing staff, "Loon Watchers", assigned to various lakes and ponds on the GMNF. Loonwatch "adopt-a-lake" volunteers contribute over 2,000 hours annually with monitoring, nest site protection, outreach, and loon rescues. Loonwatch Day volunteers survey 130-160 lakes during the annual statewide survey in July.

**Evaluation and Conclusions**: Loon populations have been on an upward trend in part due to increased awareness, and site specific protections throughout the State of Vermont and the GMNF.

**Recommendations**: Continue to provide support to the Vermont Loonwatch program, and act on any recommendations they deem appropriate, at site specific locations on the GMNF.

**Evaluation Question**:
Do gray wolves, eastern cougars, or Canada lynx occur on or near the GMNF?

**Background**: Continued collaboration with USFWS and VDFW show that no populations of these species occur on or near the GMNF.

# Wildlife: Management Indicator Species

**Evaluation Question**:
What are population trends of Management Indicator Species (MIS)? To what extent are MIS responding to Forest Service management of suitable habitat?

**Monitoring Question**: To what extent are forest management activities providing habitat for MIS?

**Monitoring Driver**: Forest Plan Goal 2, Maintain and restore quality, quantity, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

**Background**: see FY07 M&E Report.

**Monitoring Activities**: In FY09 Forest Service staff and volunteers continued to collect data on American woodcock, and ruffed grouse. This monitoring was done in an effort to add data and continue the pursuit of quantifiable information that will determine the trends of populations and their habitats as the result of the GMNF's management practices. Each of the monitoring activities was completed using forest staff and volunteers following protocols established for that purpose in 1982.

**Evaluation and Conclusions**: MIS survey data was compiled and assessed in FY2001 in an effort to detect trends; data collected since then has not changed that assessment. The assessment reported that some species such as the blackpoll warblers, peregrine falcons and beaver (1987 Forest Plan MIS) show a growth trend, species such as the American woodcock and white-tailed deer have shown a decline. Other MIS have shown no discernable trend.

**Recommendations**: Continue to increase monitoring, evaluation, and partnerships with the goal of obtaining more and greater reliability of data.

**Evaluation Question**:
What are habitat trends for MIS? To what extent is FS management accomplishing desired distribution of age class and habitat type as desired and outlined in Forest Plan objectives?

**Monitoring Question**: To what extent are forest management activities providing habitat for MIS?

**Monitoring Driver**: Forest Plan Goal 2, Maintain and restore quality, quantity, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

**Background**: see FY07 M&E Report.

**Monitoring Activities**: In 2009 Forest volunteers and staff continued to conduct surveys for the ruffed grouse and American woodcock wherever and whenever possible on established routes. The data was added to the existing database of information for future analysis.

Biologists continue to provide guidance to the Forest regarding opportunities to increase vegetative, age class, and structural diversity whenever there is a proposed action on the forest. This guidance is outlined in the Forest Plan and is transferred to each analysis area based upon the unique characteristics of the site and the opportunities each site provide.

**Evaluation and Conclusions**: The survey and monitoring protocols are effective in that they are easy to follow and they can and do provide information that can be duplicated each year. The monitoring protocols however are limited in the amount of data they can provide and one must use the data in conjunction with other information gathered at the state and even regional levels. It is clear that the desired conditions for forest age class and species composition will be difficult to obtain, however local opportunities exist to improve and maintain habitats necessary for the maintenance of viable populations.

**Recommendations**: Continue to increase monitoring, evaluation, and partnerships with the goal of obtaining more and greater reliability of data.

# Botanical Resources

**Evaluation Question**:
What are the population trends for sensitive plants on the GMNF? To what extent is management

sustaining or enhancing habitat conditions for populations?

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

**Monitoring Driver**: Forest Plan Goal 2

**Background**: Sensitive plant species tracked by GMNF staff have been monitored periodically by the Forest Service, the Vermont Nongame and Natural Heritage Program (VNNHP), and volunteers, including those sponsored by the New England Plant Conservation Program (NEPCoP) and the New England Wildflower Society (NEWFS). Currently, there are 71 plants on the GMNF classified as Regional Forester Sensitive Species (RFSS). While VNNHP has a national database that records information about populations they track, and it includes most of the plants considered RFSS on the GMNF, they are no longer funded to enter data from rare plant populations on National Forest land. In FY07, the Forest Service introduced its own database, NRIS (Natural Resource Information System) TES (Threatened, Endangered, or Sensitive) Plants and Invasive Species, for tracking all plant data gathered as result of inventory and monitoring activities, and it is now the place where all botanical data is entered. The VNNHP database and NRIS both store population data such as numbers of plants, their condition, flowering/fruiting, any management concerns or issues, and a general rank of the occurrence from A (excellent estimated viability) to D (poor estimated viability). The intent is for data in NRIS to serve not only Forest Service needs, but also be shared with VNNHP. Progress has been made in beginning to populate the NRIS with data on rare plants, but additional data entry is needed. In addition, NEPCoP monitors plant populations that have been identified at risk in New England, including several on the GMNF, and

maintains a database of monitoring actions and needs. Coordination between NEPCoP and GMNF staff continued to improve in FY09, with the result that there is less duplication of effort.

Over the past 10 years, Region 9 of the Forest Service has collaborated with NEPCoP and local National Forest staff to develop conservation plans and assessments for rare plants. Several RFSS plant species on the GMNF have conservation plans and assessments as a result of this work. These conservation documents identify actions recommended in order to help conserve the species of interest.

**Monitoring Activities**: No changes to the RFSS list have occurred since it was updated in FY06, and FS staff continue to track 71 plant species (see list at end of document). The Forest Botanist maintains a list of plant species to evaluate for the next region-wide list update. At this time, there are 13 vascular plants and three non-vascular plants waiting for evaluation and potential inclusion on the list. There are also two species waiting for evaluation and potential removal. During the waiting period, any management activities that might affect rare plants not on the RFSS list would be discussed, along with potential protective measures, with VNNHP. Any plant on the RFSS list that might eventually be removed from the list would still be afforded the same protection as any other RFSS. A summary of FY09 monitoring and related activities is provided below.

- An administrative study on the effects of forest management activities on *Polemonium vanbruntiae* (Appalachian Jacob's ladder) was initiated in FY08 under a cost-share agreement with the University of Vermont, with Dr. Laura Hill Birmingham as the lead investigator was continued in FY09.
- Monitoring of four populations of two different plant species was accomplished by local volunteer, Warren King
- One orchid on the RFSS list was monitored collaboratively with NEPCoP
- In total, 25 plants on the RFSS list (60 populations) were monitored by Forest staff and volunteers; plants monitored included:
    - 13 species of wildflowers (40 populations)
    - 8 species of grasses sedges and rushes (12 populations)
    - 2 species of ferns and fern allies (2 populations)
    - 2 species vines, shrubs, and trees (6 populations)
- New occurrences were found of the following RFSS:
    - *Asclepias exaltata* (poke milkweed)
    - *Carex argyrantha*
    - *Carex foenea* (2)
    - *Carex haydenii*
    - *Cypripedium parviflorum* var. *pubescens* (subpopulation)
    - *Geum laciniatum* (5)
    - *Juglans cinerea* (4)
    - *Panax quinquefolius* (2)
    - *Phegopteris hexagonoptera* (subpopulation)
    - *Sisyrinchium angustifolium*
- Twenty two populations of rare plants that are not RFSS were monitored because they were found at or near RFSS (some are not likely of viability concern, while others may be evaluated during the next RFSS list update):
    - *Adlumia fungosa* (1 new)
    - *Alopecurus aequalis* (1 known)
    - *Botrychium multifidum* (1 new, 1 known)
    - *Cardamine concatenate* (1 new)
    - *Carex folliculata* (1 new, 1 known)
    - *Dicanthelium acuminatum* ssp. *Columbianum* (1 new)
    - *Crataegus flabellata* var. *flabellata* (1 new)

  - *Gentianopsis crinita* (1 new)
  - *Galium trifidum* (2 known)
  - *Geranium bicknelli* (1 new)
  - *Glyceria borealis* (2 known)
  - *Lilium philadelphicum* (1 new)
  - *Mimulus moschatus* (1 known)
  - *Ranunculus pensylvanicus* (1 new)
  - *Sanicula trifoliata* (3 new)
  - *Torreyochloa pallida* var. *fernaldii* (1 new)
- Many sites of proposed ground-disturbing projects were surveyed by Forest staff, with the focus on the Upper White River Integrated Resource Project

Monitoring protocols were consistent with NRIS TES Plants, the new USDA Forest Service corporate database.

**Evaluation and Conclusions**: Last year we reported that, after data reconciliation efforts in 2008, we had one of our most successful monitoring seasons to date, and we expected to have less success in future years as we searched for populations with poor location information. While fewer populations were monitored in 2009 than in 2008, the success rate in relocating populations was higher than ever before, and included some populations that had not been seen in many years, but were finally relocated. We do expect our success rate to decline in future years, however, because our focus will be on populations with poorer records. Results of this year's monitoring are summarized above, with highlights below and details in Table 1.

- A population of *Cypripedium reginae* (showy lady's-slipper) that had not been relocated and formally monitored in over 100 years that was located by seasonal employee Aaron Marcus and found to be a large, robust population.
- Seasonal employee Mel Green located a new population of *Galium kamtschaticum* (boreal bedstraw), making this the only known extant population of this species on NFS lands.
- Last year, we reported that the only documented population of *Collinsonia canadensis* (Canada horsebalm) on the GMNF was searched for and not found for the second time in two years, despite confidence that the right site was searched both times. In 2009, volunteer Warren King relocated this population.
- In FY08, we reported an ongoing need to search for *Pa*n*ax quinquefolius* (ginseng) to determine whether populations have disappeared, or searches have simply not occurred in the right location. Two new populations were found in FY09, and two known populations were monitored, only one of which was able to be relocated.
- In 2008 we reported that, while *Carex bigelowii* (Bigelow's sedge) has been successfully monitored several times over the years, and a qualitative assessment of the monitoring data indicates the population is increasing, the plot photos have never been quantitatively analyzed, with a report written that documents population trends. In 2009, intern MaryBeth Dewey took on this task, and wrote in her report that, "alpine vegetation on Mount Abraham has responded well to restoration efforts over the past 17 years. Total vegetation cover increased over the 17-year monitoring period from 6.8 percent to 16.9 percent, with a net increase in fir, sedge and bryophyte cover".
- In total, 60 populations of 25 different species were monitored. None of the populations located appeared to be declining; 12 populations of 9 species were not found, which may indicate either a decline in that species, or poor location information. The rest of the populations and species were found and appeared to be doing well. Details are provided in Table 1**.**

**Recommendations**: There has been a growing need to develop a plan for controlling NNIP (non-native invasive plants) near populations of RFSS. In FY09, we began developing the Green

Mountain Invasive Plant Control project, with a decision expected early in FY10. Monitoring records for RFSS in FY09 indicate additional populations also have NNIP close enough that infestations should be treated in future years.

An administrative study on *Polemonium vanbruntiae* (Appalachian Jacob's ladder) was begun in FY08. Preliminary results in FY 09 suggest that deer herbivory, canopy closure, and road maintenance may be negatively affecting the *Polemonium* populations in the study. Our recommendation for FY10 is to continue to fund this valuable study.

Last year we reported that both *Blephilia hirsuta* (hairy woodmint) and *Equisetum pratense* (meadow horsetail), which were monitored in early summer FY08, should be visited again in the near future to determine whether they survived the floods of August 2008. Both species occur at sites that were known to be severely flooded, and the pre-flood monitoring results we have provide a good baseline for understanding what happens to rare plants during periodic extreme natural events. While *Blephilia* was monitored and doing well (though growing in different locations), *Equisetum* still needs to be revisited.

In FY08, dialog began on potential locations for a future clone bank for butternut, but no decision was reached. This dialog continued in FY09, and implementation needs to occur in FY10.

In FY09 monitoring started to focus on those populations that were expected be harder to find, with the understanding that it would take more time and money per population than previously. This effort needs to continue in future years.

There is still a need for ongoing data reconciliation, including reconciling electronic versus hard-copy data. Although some data entry occurred in 2009, more data needs to be entered into NRIS, and compared to existing electronic data.

Whether or not *Uvularia perfoliata* (perfoliate bellwort) occurs on GMNF land is still in question, as it is easily misidentified. There is a need to confirm its presence at a recently suggested site in FY10, and if it is not present, remove it from the RFSS list because of lack of known occurrences.

*Hackelia deflexa* var. *americana* (northern stickseed) was monitored in FY08, but needed to have its identity confirmed by visiting earlier in the summer in a future field season. That still needs to occur.

Although detailed discussions have occurred regarding compatibility of NRIS vs. state plant monitoring data, there is a need to continue developing a rare plant data monitoring form that works well for both the state and NRIS.

Table 2.1- 9: Plants on the GMNF RFSS list that were monitored in FY09, including new occurrences found

| **Scientific Name** *Common Name* | # populations monitored | Results | Action needed |
|---|---|---|---|
| **Asclepias exaltata** Poke milkweed | 2 | 1 population increased since FY08, but no sign of reproduction in FY09<br>1 new population found | Monitor again post FY10 or FY11 trail work<br>Monitor nearby NNIP (wild chervil & goutweed) that could move in |
| **Blephilia hirsuta** Hairy woodmint | 3 | 1 monitored & vigorous<br>1 monitored post-flood; 1 sub-population gone, 2 others showed slight change in location; population increased<br>1 of questionable identity determined to be unlikely | Inform trail crews; protect if logging. |
| **Carex aestivalis** Summer sedge | 4 | 1 previously not found that was found this year & healthy<br>2 others found & vigorous<br>1 not found | Discourage nearby trail work at 2 sites (species appears to thrive on eroded soil<br>Prevent nearby NNIP (garlic mustard) from moving in<br>Search again for population not found |
| **Carex aquatilis** Water sedge | 1 | Population not found | Search again; habitat still there |
| **Carex argyrantha** Hay sedge | 1 | 1 new found | Burn small patches of habitat on a 5-15 year cycle |
| **Carex foenea** Bronze sedge | 2 | 2 new found; 1 is vigorous | Decide whether to maintain openness of habitat or allow to dwindle & remain in seed bank |
| **Carex haydenii** Cloud sedge | 1 | 1 new found near, but not on NFS lands | Share information re threats w/ landowner |
| **Carex lenticularis** Shore sedge | 1 | 1 known population found & healthy | None |
| **Clematis occidentalis** Purple clematis | 1 | Historic population not found | Search again in slightly different location |
| **Collinsonia canadensis** Canada horsebalm | 1 | 1 found after not being found 2 years in a row | Remove NNIP (honeysuckle) that is shading it; nearby ginseng needs monitoring |
| **Cryptogramma stelleri** Steller's cliffbrake | 1 | Historic population not found | Search again in slightly different location |
| Cypripedium parviflorum *var*. | 4 | Of 3 previously missing, 2 were | Revisit the 2 still not |

Table 2.1- 9: Plants on the GMNF RFSS list that were monitored in FY09, including new occurrences found

| **Scientific Name** *Common Name* | # populations monitored | Results | Action needed |
|---|---|---|---|
| pubescens<br>Large yellow lady's-slipper | | relocated & healthy, plus 1 new sub-population was found<br>1 not found | found to determine whether truly missing |
| **Cypripedium reginae**<br>Showy lady's-slipper | 3 | 2 found; 1 of them an historic population not seen in 100+ years, that is huge & vigorous<br>1 not found | Search again for the 1 not found |
| **Eleocharis ovata**<br>Ovate spike-rush | 1 | 1 population found & healthy | None |
| **Galium kamtschaticum**<br>Boreal bedstraw | 1 | New population found | Monitor post project implementation |
| **Geum laciniatum**<br>Rough avens | 10 | 5 small new populations on NFS land<br>3 known populations on NFS lands are small but healthy<br>2 new populations near NFS land, 1 is huge | None |
| **Juglans cinerea**<br>Butternut | 5 | 4 new populations found, total of 17 trees, of which 8-10 appear healthy<br>1 known population of 3 trees monitored; appear healthy | None |
| *Muehlenbergia uniflora* | 1 | 2 subpopulations appear healthy | Protect if bridge near 1 subpopulation is ever replaced |
| *Panax quinquefolius*<br>Ginseng | 4 | 1 not found<br>2 new<br>1 relocated | Revisit to search for 1 not found |
| Phegopteris hexagonoptera<br>(=*Thelypteris hexagonoptera*)<br>Broad beech fern | 1 | 1 located that was previously not found, plus a new subpopulation found; thriving despite competition | None |
| *Platanthera orbiculata*<br>Round-leaved orchis | 3 | None found | Revisit sites to determine if missing |
| **Polemonium vanbruntiae**<br>Appalachian Jacob's ladder | 4 | 4 populations monitored & healthy, including 1 small new population | None |
| **Sisyrinchium angustifolium**<br>Stout blue-eyed grass | 2 | 1 not found; habitat not very suitable anymore, but possibly suitable habitat exists nearby<br>1 new population found that is getting mowed | Check nearby sites within next few years. Monitor management regime at new site. |
| **Sisyrinchium atlanticum**<br>Eastern blue-eyed grass | 1 | 1 known population not found, though habitat still appears suitable | Revisit to determine if truly missing |
| **Solidago patula**<br>Round-leaf goldenrod | 1 | 1 known location monitored & vigorous | None |

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

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

**Monitoring Driver**: Forest Plan Goal 2

**Background**: The impact of non-native invasive species (NNIS) of concern on the GMNF has been monitored by surveying the extent of infestations in areas FS staff consider important to protect or in areas most likely to be sources of seeds or plant propagules that could be dispersed to areas FS staff consider important to protect. It also includes the results of treatment efforts, and in the future may include determinations of invasiveness. So far, most monitoring efforts have focused on surveying the extent of infestations, in preparation for developing a proposal to treat invasive plants across the GMNF.

Forest Service staff, contractors, interns, and volunteers have surveyed the extent of infestations along many trails, skid roads, and at trailheads, parking lots, and developed recreation sites (all are potential sources of seeds or other plant propagules for dispersal), as well as Special Areas, candidate Natural Research Areas, known TES (Threatened, Endangered, and Sensitive) species sites, along the main stems of the Batten Kill and White River and their tributaries, and in project sites. With the exception of riparian areas and roadsides, most sites surveyed have had few or no infestations of NNIS, and many infestations are small and isolated. Some species that were not expected to occur on the GMNF (because of high elevation or relatively low disturbance) have been found there. Riparian areas, especially the main stems of major rivers, are often found to have extensive infestations of NNIS, especially Japanese knotweed. Roadsides, especially in the Upper White River Valley, are heavily infested with wild chervil. All high elevation ponds have been surveyed for aquatic NNIS with negative results. Lower elevation ponds, such as Lefferts Pond, have infestations of purple loosestrife along their banks. In general, surveys of natural communities have focused on edges of habitats rather than interiors, e.g., woodland edge rather than deep into the woods, because edges tend to be more susceptible to infestation and are easier to access for surveys. Results of edge surveys can then suggest where to focus future surveys of habitat interiors.

The GMNF NNIS list includes one species from the Federal Noxious Weed List, the Class B portion of the Noxious Weeds on the Vermont Quarantine list (Class A plants are not known to occur in Vermont), and a portion of the State Watch List (those most likely to occur or be problematic on the GMNF (see Appendix B, pp. B4-B5 or, to see the entire quarantine and watch list with fact sheets for individual species, go to http://www.vtinvasiveplants.org/).

**Monitoring Activities**: **I**n May through September of 2009, the following monitoring and related activities occurred:

- Monitoring occurred again at ten sites along the White River where floodplain restoration, including manual control of Japanese knotweed, is occurring.
- Monitoring Wilderness areas for NNIS is ongoing.
- Roadsides, trailheads, and trails in the Upper White River Integrated Resource Project (IRP) area were monitored for NNIS by Forest staff. The UVM Lands Crew monitored NNIS at the same kinds of sites in the Dorset-Peru IRP area.
- Wild chervil that was reported from the Natural Turnpike integrated resource project area in previous years was monitored again in FY09, followed by a volunteer day to hand-pull these plants along FR 54, plus continued hand-pulling by the VYCC.

- A cooperative weed management area (CWMA) that was initiated in FY08 in the Upper White River sub-watershed continued monitoring and collaborative control efforts. In particular, a roadside wild chervil control study was established collaboratively with the Vermont Department of Transportation along Route 100, and a volunteer wild chervil control day occurred along FR 101 in the Upper White River IRP area. This control effort was supplemented by additional manual control by the VYCC.
- Sites for 60 populations of plants on the Regional Forester Sensitive Species (RFSS) list were monitored for NNIS. An additional 22 populations of rare non-RFSS were also monitored for NNIS. Monitoring was completed by Forest staff and volunteers.
- In the Lincoln-Ripton area, the administrative study Appalachian Jacob's ladder (RFSS) that began in FY08, continued in FY09, and included investigating the relationship between NNIS and the health of the rare plant population. Work was carried out through a challenge-cost share agreement with UVM.
- A collaborative effort between Sugarbush ski area staff, GMNF staff, and VYCC occurred in FY09 to map all wild chervil infestations on ski trails at Lincoln Peak, which is mostly on NFS land. This was followed by manual control of some small infestations by Sugarbush staff. Mt. Snow continued to mow early to control wild chervil.

Monitoring Japanese knotweed at floodplain restoration sites occurred to determine whether ongoing manual control could be successful in small, relatively isolated settings, where other restoration work was occurring. Monitoring in Wilderness areas occurred because Wilderness is an area to be affected by natural ecological processes rather than human activities, and Wilderness managers are required to develop NNIS management plans. Monitoring wild chervil along FR 54 occurred in order to plan the volunteer control effort at this location. Sites of proposed integrated resource projects were monitored to evaluate the potential for NNIS to spread during project implementation, per Forest Plan direction, and also to propose future control projects; most small projects are not monitored. Monitoring rare plant populations occurred and an administrative study was begun to protect these areas from NNIS. Monitoring NNIS at ski areas occurred so that Forest staff could assist them in developing NNIS management plans that would help prevent spread of these undesirable plants beyond where they are currently established.

All data was gathered using the USDA Forest Service Natural Resources Information System (NRIS) protocol, and will be recorded in the newly revised NRIS corporate database. All monitoring was completed between mid-May and late September.

**Evaluation and Conclusions**: While monitoring indicated the extent of NNIS infestations, FS staff does not currently have a means of measuring the effect of NNIS on other resources, nor does FS staff usually have measurements of the same infestations over time, which would indicate how invasive a particular NNIS can be. An exception is the White River floodplain restoration sites, where monitoring and control of the same Japanese knotweed infestations occurs annually. Monitoring protocols were otherwise efficient and easy to use.

Results of monitoring the volunteer Japanese knotweed control sites continue to indicate that while there has been a small reduction in Japanese knotweed at these sites over time, it is unlikely that manual control will be adequate for controlling this species. This result is not unexpected, since Japanese knotweed is known to be an aggressive plant that is hard to control; what was unknown was that these relatively small isolated patches would be this hard to control.

Wilderness NNIS monitoring in FY09 was focused on the boundary of the Bristol Cliffs Wilderness Area. The two NNIS found were Japanese barberry and honeysuckle, and were along the New Haven River.

Repeat monitoring of wild chervil in the Natural Turnpike integrated resource project area suggested that the infestation was still at or above the initial level recorded in FY07. Given that it was well-established when first discovered in FY07, it is not surprising that there would be a substantial seed bank contributing to its regrowth each year for a few years. Another volunteer wild chervil pulling event was held, resulting in removal of wild chervil from about a mile of roadside.

Last year we reported that botanical reviews of the Upper White River integrated resource project area showed an abundance of wild chervil along roads and at one proposed log landing; more discrete patches of Japanese knotweed and multiflora rose along some roads, common buckthorn in a couple of wildlife openings, and one barberry bush in a forested stand. With the exception of the lone barberry bush, field work in FY09 continued to support the hypothesis that all forested stands were free of NNIS. This suggests that, while NNIS do not currently seem to be having much of an impact on forested resources in this area, the potential for them to expand into the forest from adjacent roads exists. Several NNIS control projects are being proposed within this integrated resource project.

Out of 60 populations of RFSS monitored, nine (15%) had infestations of NNIS at or relatively nearby the rare plants; three were immediately controlled by manual means. Of the 22 populations of rare plants monitored that are not RFSS, three (14%) had infestations of NNIS at or relatively nearby the rare plants; one was immediately controlled by manual means. Previously we reported that rare plant populations were mostly free of NNIS, suggesting minimal impact to this resource. It is unclear whether the increase in NNIS reported near rare plants (RFSS or not) reflects a change in NNIS distribution and establishment, or a change in success in locating rare plant populations, and therefore a more accurate assessment of the presence of NNIS near rare plants.

A preliminary report on the relationship between Appalachian Jacob's ladder and NNIS that was expected in FY09 will not be complete until early in FY10.

**Recommendations**: Previously we reported the need to investigate chemical means for continuing control of Japanese knotweed at sites where manual control is labor intensive and only minimally successful. Public scoping for the Green Mountain Invasive Plant Control Project occurred in FY09, with completion of the environmental assessment, followed by a decision, expected in FY10.

The majority of the recommendations listed in FY08 are still recommended in FY09, which is not unexpected, given the general nature of the recommendations and the persistence of NNIS infestations, once they are established. These recommendations are listed below.

Continue monitoring for NNIS in designated Wilderness. Because they are minimally infested, infestations should be treated immediately so that they do not increase in size or spread to adjacent areas. Infestations on adjacent land should be brought to the attention of the landowner, with the goal of a cooperative effort to control them with any willing landowners. These small infestations are excellent places where early detection, if followed by rapid response, may result in complete control of infestations.

Continue monitoring for NNIS in proposed project areas. For any infestations found, NNIS management plans should be developed. At this time, many small projects do not have field review, and efforts are focused more on NNIS prevention.

Continue annual wild chervil control, followed by monitoring on FR 54. This may help prevent its spread in the Natural Turnpike integrated resource project area, and may also help protect nearby populations of the rare plant, Appalachian Jacob's ladder.

Continue development of the Upper White River CWMA, including finalizing a Memorandum of Understanding and searching for funds to begin education, outreach, and control efforts. Given the abundance of wild chervil along roadsides within the CWMA boundaries, collaboration with town road crews and the Vermont Department of Transportation will be necessary to slow its spread.

Continue to incorporate surveys for NNIS whenever rare plants are monitored. Where NNIS are found, these sites should be prioritized for treatment, to prevent NNIS competition with the rare plant population.

Conduct additional monitoring for NNIS at ski areas; once all infestations are mapped, each ski area should work cooperatively with GMNF staff to develop an overall NNIS management plan. Although the majority of the part of Sugarbush Ski Area that overlaps NFS lands has had surveys, other ski areas have not.

Overall, monitoring results showed that sizes of infestations, amount of labor needed to control them manually, ineffectiveness of manual control techniques on some species, and the potential for increased distribution of NNIS across the GMNF, demonstrate the need to develop a plan for integrated pest management for all NNIS, forest-wide. Invasive Plan Control project development is expected during FY09 and should be completed as quickly as possible.

# Timber

**Evaluation Question:**
Are lands adequately restocked according to stocking surveys?

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

**Monitoring Driver**: Lands are adequately restocked as specified in the Forest Plan.

**Background**: see FY08 M&E Report.

**Monitoring Activities**: FS Staff did not complete any formal first year evaluation (stocking) surveys on plantations as no new trees were planted in 2009 and site preparation contracts for naturally regenerating stands were suspended for a part of the field season. First year surveys will resume in 2010 one year after site preparation contracts for those units are completed. It was noted through informal surveys and field visits of Dutton Brook II and Apple Orchard sales that these harvested stands are regenerating as expected.

Third year Evaluation Surveys were completed on 115 acres for recently harvested sites on Manchester and Middlebury Districts and the results were reported in the FACTS data base. All units are fully stocked with new trees. For natural regeneration survival examinations, all sampled sites were at least minimally-stocked with acceptable seedlings or saplings to be considered moving towards reforestation certification. All stands receiving these plot samples have had even-aged and/or uneven-aged regeneration harvests. Restocking sampling work involves visiting harvested stands and observing the new regeneration using numerous 1/700 and 1/100 acre sized circular plots to count seedlings and saplings. A plot is considered stocked if at least one acceptable seedling or sapling occurs in it. The plot data is summed and a percent of total stocking is determined for each stand.

**Evaluation and Conclusions**: Review of evaluation surveys completed in FY2006- 2009 indicates that reforestation efforts underway continue to be sufficient to meet stocking certification for all

units within the required timeframes. Monitoring protocols have been rigorously tested, certifications of successful reforestation have requisites, and procedures are detailed in the 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.
After careful evaluation, we may take other corrective actions to assure reforestation efforts take hold. For example, using these practices to evaluate the Patterson Brook plantation, we found a shift in tree species due to browsing and mortality of some planted hemlock and pine tree seedlings.

While overall the planting was successful and the stand is well stocked with a mix of young trees, we had hoped for more pine and hemlock to help the area become dense winter cover for deer. To that end, we plan on supplementing the first planting with another mixed planting of 9000 pine, hemlock and red spruce in May, 2010.

**Recommendations**: This monitoring item is on track and the results are not surprising for northern New England forests, where naturally-regenerating stands are the norm. Continue to conduct first, third, and if necessary fifth year plantation survival evaluations to determine if survival and growth of planted stock is adequate following reforestation efforts and that adequate reforestation has been achieved on all other units of regeneration harvesting.

**Evaluation Question:**
Is the maximum opening size for even- aged harvesting being met and are we accomplishing resource objectives. Are we meeting wildlife habitat regeneration objectives in both size and quantity of openings by habitat types? This is a required Forest Plan monitoring item. It helps whether we have met standards for maximum opening size and scenic integrity.

**Monitoring Question**: Are maximum size limits for harvest areas appropriate, and should these limits be retained?

**Monitoring Driver**: Opening size is consistent with Forest Plan S&G 2.3.5 – Openings, and NFMA requirement on opening size.

**Background**: See FY08 M&E Report.

**Monitoring Activities**: GMNF staff analyzed the size of even-aged regeneration harvest units (clearcuts, shelterwoods or variants) produced in FY 2009 timber sale offerings. Six of these types of harvest units were offered and sold in the South Road, Burnt Meadow and Old Cemetery sales. They had openings that would range from 2 to 25 acres in size. Six of these types of harvest units were reported cut in the winter of FY 2009 from existing timber sales. They were all less than 30 acres in size.

See the FY 2008 M&E Report for more descriptive discussions on opening size concerns as voiced in public meetings.

**Evaluation and Conclusions**: The 30 acre size limit for temporary openings created by even-aged regeneration harvest has not been exceeded. Forest Service interdisciplinary teams have recently discussed designing openings that approach the 30 acre size limit in order to address habitat needs for bird species that require larger openings. This continues to be difficult to implement due to public concern over creating forest openings, and may affect the ability to achieve the Forest Plan desired future condition (DFC) for acres of treatments, age classes and

habitat. In many cases, stand acres proposed for this type of harvest are reduced to maintain other resource conditions such as deer wintering habitat, visual quality guidelines along roads, trails and visually prominent locations or to buffer wetlands. Larger sized units may help in ecosystem restoration where removal of non-native monoculture plantations may be desirable. Future efforts planned, in the Upper White River Project did address this situation and included some larger shelterwood and clearcut harvest units in the proposal for larger temporary and permanent openings.

See FY08 M&E Report for additional details.

*Moses Pond Timber Sale*

**Recommendations**: The GMNF staff will continue to incorporate openings through even-aged management to the extent possible in vegetation management proposals, and look for opportunities to create the maximum acre size of units in those proposals. Planning for the Upper White River Integrated Resource Project (IRP) in FY 2009 showed there is opportunity to plan for and achieve larger temporary opening sizes. Working with stakeholders and wildlife researchers, GMNF staff did identify stands with the proper condition, and proposed them for even-aged regeneration harvest that would create larger openings closer to 30 acres in size. We will continue to locate them where standards and guidelines allow. We will plan carefully where other desired resource conditions might limit cutting unit size to better achieve resource conditions, stand sizes and acres treated.

**Evaluation Question:**

Are lands termed unsuitable for timber production adequately described and mapped?

**Monitoring Question**: To what extent is timber management occurring on lands suitable for such production?

**Monitoring Driver**: This is a NFMA legally required item. This monitoring helps identify where timber harvest can take place.

**Background**: See FY08 M&E Report

**Monitoring Activities**: Using maps and current information in 2009, GMNF staff conducted field reviews for new projects, including the Upper White River Project, and for implementing parts of the Natural Turnpike Project, specifically, the Cobb Hill South timber sale. GPS units were used to help map wetlands, and to mark specific spots such as vernal pools and ledge outcrops for timber markers and trail layout crews to avoid. GMNF staff found that when applying Forest Plan Standards and Guidelines for buffering and protecting wetlands that there were more acres of unsuitable land consisting of forested wetlands, riverine wetlands and shallow soil than previously thought when the Forest Plan was developed. GMNF personnel have conducted office and field training to help field crews and specialists better identify and map wetlands and other unsuitable lands for each project.

**Evaluation and Conclusions**: Will be reported in the 5 year Comprehensive Evaluation Report.

**Recommendations**: Will be reported in the 5 year Comprehensive Evaluation Report.

# Special Forest Products

**Evaluation Question:**
How many and what special forest products (SFPs) 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 Question**: To what extent have Forest Plan Objectives been attained?

**Monitoring Driver**: Forest Plan Objectives

**Background**: See FY08 M&E Report

**Monitoring Activities**: Currently, GMNF staff monitors the quantity and type of SFPs that had permits issued for gathering, as well as those for which permits were denied. In addition, the Northern Research Station (NRS) regularly monitors our maple tapping areas to evaluate the health of the maple trees and to determine if any adjustments to, or suspensions of, operations are required. In FY09, 311 permits were issued for the following products:

**Table 2.1-10: Special Forest Product Permits**

| Product | Quantity |
|---|---|
| Maple sap | 4,220 taps |
| Firewood | 377 cords |
| Dead/down wood | 0 |
| Christmas trees | 155 trees |
| Boughs | 4 tons |
| Seedlings | 0 |
| Saplings | 0 |
| Miscellaneous | 0 |
| Fungi | 250 lbs |

During FY09, GMNF staff monitored maple sap permit areas during the sugaring season, no compliance issues were noted. GMNF staff also monitored fuelwood permits for compliance and issued citations for any unauthorized fuelwood cutting; xx citations were issued.

Also during FY08, FS staff initiated a study, which was recommended during plan revision by Marla Emery of the NRS, to assess the uses of special forest products in and around the GMNF. We established an agreement with Clare Ginger of the University of Vermont, and local ethnographer Virginia Nickerson, in partnership with Marla Emery of the NRS, to document current uses of SFPs in and around the GMNF as well as compile local ecological knowledge associated with those uses. A final report should be completed by the end of June 2009. From this research we hope to acquire:

- a more accurate listing of SFPs for the GMNF,
- identification of SFPs that merit further study or active management to assure sustainability,
- commodity chains for selected commercial species,

- a description of social, cultural, and economic values of gathering on and around the GMNF,
- guidelines for determining sustainable harvest thresholds, and
- potential strategies for collaborative management planning with SFP gatherers.

A final draft of the report was submitted in August of 2009. The Forest Service is currently considering potential actions to take for sustainable management of SFPs based on this report.

**Evaluation and Conclusions**: Numbers of permits issued continue to run higher than the average prior to plan revision. The increase in numbers of permits and in quantities sold continues to be influenced most by firewood permits, which were smaller than last year but still high compared to the 10-year average. A large increase in maple taps in FY09 was due to the addition of one permittee and expansion by another. Other gathering continued at levels similar to previous years. No environmental conditions of concern were noted in association with permits this year.

The increase in firewood requests that began in FY08 and continued in FY09 suggests a higher sustained level of use and interest than in the earlier part of the decade. FS staff is actively evaluating opportunities for additional firewood harvesting to meet this demand. Given that timber harvesting on the GMNF is well below the Allowable Sale Quantity established in the 2006 Forest Plan, and that the focus of firewood harvesting is on readily accessible dead and down trees, this increase in firewood demand is probably sustainable.

Several changes in regulations and policy regarding permitting of collection of botanical products for personal use are still being developed at the national level. A final rule on these changes was published in FY09 but implementation was deferred indefinitely to accommodate public comment and concerns. The new rule, when or if it is implemented, may require FS staff to establish more explicit sustainable harvesting levels for many products. The assessment of special forest product uses for the GMNF that was completed this year will be critical in helping to establish these sustainable harvest levels. The report identified two plant species or groups in need of management attention (ginseng, lady's-slippers), and four plant species that merit further study to determine if active management would be advisable or feasible (fiddleheads, wild leeks, sweetgrass, and black ash). Collecting of ginseng and certain lady's-slipper species is currently not allowed on the GMNF because these species are considered Regional Forester Sensitive Species (RFSS). Management attention is recommended to boost population numbers and ultimately viability, which is also the goal of the RFSS program. The researchers recommend working with gatherers and others to evaluate the four species that need further study, and also to refine general and species-specific sustainable management guidelines for gathering of special forest products.

**Recommendations**: Use the results of the SFP study to identify general sustainable harvest guidelines for SFPs gathered on the GMNF, and develop a strategy for studying and evaluating if additional management guidelines are needed for fiddleheads, leeks, sweetgrass, and black ash.

# Rare Features

**Evaluation Question:**

To what extent are rare and outstanding biological, ecological, or geological features on the GMNF being protected, maintained, or enhanced? To what extent are ecological types on the Forest represented within the ecological reference area network? To what extent do ecological types recognized on the Forest accurately represent the diversity of ecosystems and potential natural vegetation on the Forest?

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

**Monitoring Driver**: Forest Plan Objectives

**Background**: See the FY07 Monitoring and Evaluation Report.

**Monitoring Activities**: Thirteen sites with special features were monitored this year, including Beaver Meadows and Abbey Pond, Chandler Ridge, Dutton Brook Swamp, Gilmore Pond, Hat Crown/Silent Cliff, Leicester Hollow, McGinn Brook, Mount Tabor Work Center Swamp, North Pond, Stamford Stream Wetland Complex, Texas Falls, The Cape RNA, and Thendara Camp Fen. Several additional sites in Wilderness were checked during the year by Wilderness staff (including Little Pond, Bourn Pond, Little Mud Pond, Big Mud Pond, and Skylight Pond). During this year as last, fish, wildlife, and botany crews accomplished much of the monitoring.

At each site, field notes are taken addressing the condition and quality of the site and/or rare plant populations. In general, because these sites have been inventoried and evaluated in the past, notes highlight distinctive features, new information that had not previously been collected (for instance, GPS coordinates of special features), and changes in size, disturbance levels, and conditions of the surrounding landscape. These notes are then incorporated into site reports and/or rare plant reporting forms that are prepared during the winter months.

Field crews visiting the non-Wilderness sites identified the following conditions of interest:

- Several rare plants were relocated at Beaver Meadows and Abbey Pond, Chandler Ridge, Dutton Brook Swamp, Hat Crown/Silent Cliff, Leicester Hollow, McGinn Brook, Mt. Tabor Work Center Swamp, and The Cape RNA. One rare plant relocation (showy lady's-slipper) had last been seen in 1908.
- Some rare plants were not relocated at Chandler Ridge, Hat Crown/Silent Cliff, Leicester Hollow, Stamford Stream Wetland Complex, The Cape RNA, and Thendara Camp Fen. These sites will be rechecked over the next few years to determine if the rare plants are gone from these sites. Aside from the 2008 flood at Leicester Hollow, there were no obvious site impacts that could be observed to have contributed to the loss of these populations; they were likely overlooked. The locations of some populations are not well-described and so may not be relocated without very intensive surveys or good luck.
- Due to the August 2008 flood at Leicester Hollow, the trail along Leicester Hollow Brook was destroyed along a substantial portion of its length. A new relocation of the trail is proposed and was evaluated during 2009 with field surveys to determine a location for the trail with the least ecological impact, and to assess the extent of stream restoration activities that may be needed. Much of the trail is proposed to be moved out of the floodplain and up onto the side hill in the ravine. A decision on and implementation of this trail relocation and associated restoration work is planned for 2010. Leicester Hollow will be monitored during and following this work to assess impacts of construction, recreational use in the new location, and recovery of the riparian zone.
- The Chandler Ridge Trail is proposed for reconstruction as needed to support mountain bike use, a use that is currently not allowed. The trail was reviewed to evaluate potential impacts to the ecological integrity of the site and locate and protect rare plant populations. A decision on and implementation of this trail reconstruction work is planned for 2010. Chandler Ridge will be monitored during and following this work to assess impacts of construction and subsequent bike use.
- Wild chervil (a non-native invasive plant species) was noted just outside the southern boundary of Texas Falls Ecological Special Area.
- Illegal campsites and expansion of campsites through cutting vegetation continues to be a problem at Branch Pond, and algae growth in the pond was particularly noted this year.

- Small areas of sedimentation and trail wash-out were noted at Grout Pond.
- Some litter and old camping supplies were noted at North Pond.

GMNF Wilderness staff visited and monitored several sites within Breadloaf, Battell, Glastenbury, Big Branch, Peru Peak, George Aiken, and Lye Brook Wildernesses during FY2009. Ponds and cliff sites within these Wilderness areas are popular camping areas and some, like Bourn Pond, get frequent visitors. Wilderness staff clean up trash and camping debris, and return the sites to a relatively natural condition. Staff also check these areas for non-native invasive species (NNIS).

In addition to the routine cleaning and maintenance in Wilderness areas, GMNF Wilderness staff noted the following issue or actions in association with special features within Wilderness:

- No new tree cutting for trails at Skyline Lodge/Skylight Pond area.
- While snowmobiles did not intrude into the Little Pond area during the winter, there was a report of a dirt bike in the area.

About 110 acres was inventoried for potential significant ecological features during 2009 in the Dorset-Peru area, within which a 40-acre area of old forest was visited and found to have old growth characteristics based on large-sized trees and abundant coarse woody debris. FS staff could not determine the exact age of the stand because the trees were too large to core for an age estimate. The dominant species were hemlock and white pine, with some oak toward the lower elevations above a series of rock outcrops and red spruce at the higher elevations at the top of the escarpment. This area is currently considered unsuitable for timber management due to steep terrain, and so may be adequately protected. It will be further evaluated during this project to determine if additional protective designation is necessary.

A plan amendment was initiated in FY08 to change the management area designation of portions of the Forest affected by Wilderness designations in 2006. This amendment includes the Mount Horrid cRNA, which mostly now lies within the Joseph Battell Wilderness. The proposal under consideration is to remove the cRNA designation, but to protect the features and values that qualify it for RNA designation through specific language within the Forest Plan. The small portion of the cRNA outside of Wilderness is proposed for Remote Backcountry management area designation. The amendment went out for public review in September of 2008, and a final decision is expected during FY2010.

**Evaluation and Conclusions**: This year's monitoring was successful primarily because of the addition of biological and botanical field crews who could assist in the monitoring. Crews were kept very busy this year with projects associated with the American Recovery and Reinvestment Act (ARRA), and still we were able to visit more than the desired 12 sites. With continued cooperation between the ecology program, and biological and botanical field crews, it is likely that most sites will be monitored on the 5-year monitoring cycle identified for these areas. Some sites have received repeated visits to relocate rare plants or to respond to natural disturbances or proposed activities, which does reduce the number of new sites monitored each season.

Protocols continue to be effective. The monitoring continues to demonstrate the importance of gathering precise GPS coordinates for special features and rare plant populations so they can be relocated efficiently. We continue to struggle with finding time to transcribe paper forms into computer databases, but the cost of rugged handheld data recorders continues to limit our ability to eliminate paper forms or field books.

Three years of monitoring have found that impacts to the integrity of ecologically significant sites and features are most often associated with recreational uses or natural disturbances. A stronger relationship between recreation and ecology staff is important to effectively mitigate some of these

impacts. The ecology and recreation programs continue to strive toward a close working relationship so that management of recreation use within these special areas can support their ecological integrity.

**Recommendations**: Continue to monitor around 12 sites with significant ecological features on the GMNF with help from available biological and botanical crews. This includes monitoring three sites (Chandler Ridge, Leicester Hollow, and Texas Falls) that will be impacted by trail or rehabilitation activities planned for FY2010.

Continue to evaluate the Dorset-Peru area for potential significant ecological features, and work with the Vermont Nongame and Natural Heritage Program (VNNHP) to validate the possible old growth area and evaluate protection options.

Include language in the Forest Plan amendment for the New England Wilderness Act remnant areas specifically protecting the significant ecological features contained within them, including the current Mount Horrid cRNA in the Wilderness and Remote Backcountry management area direction.

Work more closely with recreation staff to plan actions to mitigate issues raised during special area monitoring. Prioritize potential actions and then seek funding and partnerships to implement them

# Insects and Disease

**Evaluation Question**:
To what extent have destructive insects and disease organisms increased?

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

**Monitoring Driver**: Destructive insects and disease organisms do not increase to potentially damaging levels following management activities.

**Background**: This monitoring item helps track trends in insect and disease (I&D) activity on the Forest. Monitoring of insect and disease pathogens can be employed to determine when, how much, and what kinds of management actions, if necessary, should take place to prevent or suppress undesirable I&D agents. As the GMNF provides a portion of host material for a variety of I&D agents found within the state of Vermont, this monitoring element is best undertaken in a more "landscape" context with adjacent landowners, municipalities and local, state and federal monitoring organizations. For instance, monitoring of emerging insect or disease agent threats, such as the emerald ash borer and Asian longhorned beetle, both exotic insect pests, has become a national monitoring effort. In these cases, early detection efforts are the combined focus of forest research and management organizations at the state, federal and university levels.

In 2009 the forest increased efforts to share information about the spread of non-native pests with the public and partners. Information and identification posters, bumper stickers, refrigerator magnets, displays of Emerald ash borer (EAB) insects and damaged wood were used at public venues and trade shows to help explain the threats. EAB kits and education materials were secured and shared with winter sports resorts on NF lands and associated homeowner associations. Forest health and insect identification web site links were provided to these areas for their web sites to help with public and homeowner education.

| Table 2.1- 12 Insect and Disease Tracking | | |
|---|---|---|
| **Insect or Disease Agent** | **Organization & Date of Monitoring** | **Type of Monitoring Effort** |
| Forest tent caterpillar, gypsy moth, oak leaf tier, balsam wooly adelgid and dieback or mortality from Beech bark disease, Septoria leaf spot, cankers and other unknown agents | Northeastern Area State & Private Forestry, Northeastern Area, USDA Forest Service, Flown July14 -15, Flown by VT DFPR August 10-Sept. 8, 2009. | Annual Aerial Detection Surveys of forest health conditions on the Green Mountain National Forest.<br><br>Sugarbush surveys, on the ground field surveys, site visits. |

**Monitoring Activities**: In FY 2009, an annual insect and disease aerial monitoring effort was again undertaken on the Green Mountain National Forest, organized and completed by the Northeastern Area, State and Private Forestry and the Vermont Dept. of Forests Parks and Recreation. This aerial survey health data is available on the Internet located at: http://www.na.fs.fed.us/ims/aerial/viewer.htm.
Table 2.1-12 shows a listing of insects and diseases tracked, the dates of the surveys and the monitoring efforts used.

**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. In 2009, there were no significant outbreaks detected from any major insect pests. Aerial detection resulted in mapping of roughly 24, 519 acres of defoliation primarily from damage only on the north half of the forest, slightly less than that found in 2008, and a decrease from the high acres mapped in 2006-2008. The high levels of forest tent caterpillar from previous years declined significantly. Mapped damage was lower compared with the acres mapped in 2008.

The main problems were 23, 594 acres of defoliation from Septoria leaf spot, brown spot needle blight and leaftiers and unknown agents. The incidence of this and other leaf blights is a result of the very wet spring seasons the last two years and the very wet summer in 2009. These climatic conditions have kept the incidence of the disease active; however the disease did not progress to a point that tree health was adversely affected. As a result, there is probably no significant effect on the vigor of the trees.

Mortality increased to 2750 acres from beech bark disease, 2,337 acres from balsam wooly adelgid, 100 acres from white pine blister rust and 1,120 acres from flooding/high water and 370 acres from birch decline.

Permitted Sugarbush areas got some extra attention due to past defoliation. Forest Health Protection continued to monitor the Sugarbush Special Use Permit Areas on the Green Mountain National Forest in 2009. Site visits were conducted on June 18-19; pheromone traps were set and visual inspections of FTC and other insect activity were conducted. There was no FTC larval activity in any of the permit areas, and no noticeable defoliation occurred. There was increased dieback at one site, but not to the level that would impact management decisions. There was some storm /wind throw damage at another site.
This is the third consecutive year that wind throw damage has occurred at this site. In the Lincoln site, *Septoria*, a leaf blight disease, was prevalent throughout the stand, as it was in 2008.

**Recommendations**: No action should be taken at this time. Continue to monitor insect and disease activities and annual aerial detection monitoring efforts. Continue cooperation with VT

Forest Parks and Recreation Dept. in surveying for invasive species and planning for response to invasive species. Continue cooperation with DFO Forest Health Staff in conducting inventories, surveys, testing pheromones, trapping and response activities. Continue to address forest health issues during Integrated Resource Planning projects.

# Fire

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

**Monitoring Driver**: Forest Plan Objectives

**Background**: See FY08 M&E Report

**Monitoring Activities**: There was one reportable wildland fires in FY09 on the GMNF. The Black Brook Fire on the Manchester RD was suppressed by local fire departments under agreement. The human caused fire occurred in May and grew to a half acre.

**Evaluation and Conclusions**: Based on vegetation conditions and observed fire weather conditions for FY2009, fire preparedness and other fire management actions were adequate and consistent with the level of risk.

**Recommendations**: Although, fire risk is low, fire staffing and other preparedness actions should be continuously monitored during fire season.

**Evaluation Question**:
To what extent have hazardous fuels been reduced?

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

**Monitoring Driver**: Forest Plan Objectives

**Background**: See FY07 M&E Reports

**Monitoring Activities**: GMNF staff treated 14 units totaling 243 acres using prescribed fire and mechanical methods to reduce hazardous fuels in 2009. Additionally, forestry and wildlife treatments provided secondary benefit for hazardous fuels reduction, with 341 acres being treated.

Fire Regime Condition Classes, both pre and post treatment observations were made. Post treatment observations showed a move to an improved condition class, and all treatments were reported in Forest Activities Tracking System (FACTS).

**Evaluation and Conclusions**: All hazardous fuel treatments on the GMNF were initially effective in FY09. Hazardous fuels treatments also provided secondary benefit objectives, which included ecosystem restoration, and wildlife habit maintenance and improvement.

**Recommendations**: Continue the use of prescribed fire on the GMNF as a vital tool for the reduction of hazardous fuels, to maintain wildlife habitat, for timber stand improvements, and to

restore and enhance ecosystems. Mechanical treatment should also supplement prescribed fire treatments in order to effectively reduce larger diameter woody vegetation that may not be fully treated utilizing only prescribed fire.

**Evaluation Question**:
Is prescribed fire being 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 Question**: What are the effects of management practices prescribed by the 2006 Forest Plan?

**Monitoring Driver**: Forest Plan Management Area Guidance

**Background**: See FY08 M&E Report

**Monitoring Activities**: Thirteen prescribed burn units were treated in FY09 for a total of 203 acres. Pre- and post-burn monitoring was conducted on all of the prescribed burns implemented in FY09. Monitoring focused on measuring pre- and post-dead fuel accumulations as well as examining fire's effects on reducing woody encroachment (mortality).

The resource objectives of each prescribed burn are:

- to truncate approximately 80% of invading woody vegetation consisting of shrubs and tree seedlings/saplings through repeated fire entrances
- promote an increase of native grasses and forbs to cover approximately 90% of the unit by repeated fire entrances, maintaining an open grass like state

Although, site specific, the majority of the burn plans had prescribed fire objectives and acceptable range of results being: To reduce the 1hour fuels by 75% and 10 hour fuels by 50%.

**Evaluation and Conclusions**: Post burn results from prescribed fire implementation did show success in reducing overall fuel loads of the burn units. 1- hour and 10-hour fuels were reduced to acceptable levels as prescribed.100 hour and 1000 hour accumulations were not a considerable factor for these units, therefore not evaluated. Mortality of small diameter woody vegetation (shrubs and tree seedlings/saplings) occurred at acceptable levels for prescribed burns that were implemented later in the spring season. Burns implemented in early spring produced less mortality. In all of the units, there were small increases of native grasses and forbs. Fire Regime Condition Class improvements were obtained in all burn units. Although monitoring showed that prescribed burning in spring produced favorable results for reducing light dead fuels (1hr and 10hr) and small diameter woody vegetation, promotion of native grasses and forbs and effecting increased mortality in woody vegetation could be accomplished during growing season burns.

**Recommendations**: Continue the use of prescribed fire as a tool for managing hazardous fuels on the GMNF. Formalize monitoring to include FIRMON or similar plots for measuring both pre and post burn conditions to determine effectiveness.

**Evaluation Question**:
Do wildland fires managed using Wildland Fire Use successfully meet objectives set forth in the Forest Plan and the Fire Management Plan? Did the fire stay within the allowed management areas and the Fire Management Plan? Did the fire stay within the allowed management areas and fire behavior parameters presenting low risk to firefighter and public safety? Did the fire function as a natural ecosystem process to restore and/or maintain natural plant communities? Were hazardous fuels reduced?

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

**Monitoring Driver**: Forest Plan Management Area Guidance

**Background**: See FY08 M&E Report

**Monitoring Activities**: There were no naturally ignited wildfires that met WFU criteria in FY 2009.

**Evaluation and Conclusions**: The GMNF was well prepared administratively for managing WFU fires. Due to no WFU fires occurring in FY2009, evaluations and conclusions cannot be obtained.

**Recommendations**: Although natural ignitions are rare, the GMNF should continue preparing for WFU opportunities by: training fire management staff (duty officers, potential Incident Commanders, and Agency Administrators; increasing information, and coordination with the public and cooperators concerning the use of WFU; and continuously monitoring the GMNF needs, objectives, benefits, and potential negative impacts from a WFU event.

# Payments to Towns

**Evaluation Question**:
What was the amount paid to each GMNF town through PILT, 25% fund or Secure Schools? What type of communications has occurred on this topic with each town?

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

**Monitoring Driver**: Forest Plan Objectives

**Background**: See Appendix A

**Monitoring Activities**: See Appendix A

**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 the yearly appropriations.

# Lands

**Evaluation Question**:
To what extent has the GMNF land base been adjusted through purchase, exchange, transfer, interchange, boundary adjustment and donation?

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

**Monitoring Driver**: Forest Plan Objectives

**Background**: Opportunities to meet the Land and Resource Management Plan and National Strategic Plan goals are captured through purchase, donation, exchange, transfer and conveyance

of lands to improve public access, provide outdoor recreation, conserve watersheds, contain non-native invasive species, sequester carbon and prevent forest fragmentation. FS also staff aim to improve legal public use of National Forest System lands by acquiring rights-of-way for roads and trails. GMNF lands have been increased and consolidated to reduce fragmentation and encroachment, and achieve maximum public benefits for recreation, biodiversity, critical habitat conservation, and effective management.

***Purchases and Donations****:* In FY09, two purchases amounting to 16 acres in the Town of Shaftsbury occurred. These lands will provide for forest products, dispersed public recreation use, and deep woods wildlife species.

Both parcels will become part of the "Green Mountain Escarpment," Management Area, where the major emphasis is to maintain or enhance populations of rare or uncommon plant and animal populations. They meet the Green Mountain National Forest Plan (Forest Plan) goal for land purchase by providing "uncommon biological qualitities.

**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. Monitoring activities in the form of the information sharing described above will continue to enhance the land adjustment program.

**Evaluation and Conclusions**: The major partner assisting the GMNF in FY09 was The Conservation Fund, who bought forward an outstanding parcel in the town of Jamaica and for future purchase, and who has been working with the District Ranger and lands staff, to identify other critical lands for future acquisitions. The information gained from our partners and the willingness of local participation continues to highlight the importance of partnerships and community involvement.

**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.

# 3. RESEARCH AND STUDIES

**Effects of Forest management on Polemonium vanbruntiae (Appalachian Jacob's Ladder).** An administrative study on the effects of forest management activities on Polemonium vanbruntiae (Appalachian Jacob's ladder) was initiated in FY08 under a cost-share agreement with the University of Vermont, with Dr. Laura Hill Birmingham as the lead investigator.

**American Chestnut Cold Hardiness Trials and Research.** American Chestnut Plantings were established at Fay Meadows in Brandon to determine how to best restore this native species.

**Restoring American Chestnut to the Northern Forest**
This project is a joint venture of the Forest Service Northern Research Station and the University of Vermont. Approximately 650 American chestnut seedlings were planted in mid-June 2009 on Forest Service lands. Monitoring and measurements of the trees will continue through 2010. The purpose of this study is to determine the cold tolerance of American chestnut seedlings, and to help determine the silvicultural treatment best suited for the establishment of the American chestnut in the Northern Forests.

**Soil Carbon and Other Quality Indicators in Managed Northern Forests**
Project forest sites are on State of Vermont, Federal (GMNF and Marsh-Billings-Rockefeller National Historical Park, Woodstock), UVM and private lands. Beginning in 2009 and continuing for several years, this project will establish reference plots representative of forest and soil types common in the Northern Forest lands that will be actively managed in the future. These plots will provide a contrast to those recently established on public, unmanaged lands. The plots will provide baseline values against which to measure the combined effects of climate change, air pollution, natural forest dynamics and forest management.

**Establishment of a Butternut (*Juglans cinerea*) Clone Banks on Green Mountain and Finger Lakes National Forests**
In 2009 GMNF personnel collected twig samples from healthy (possibly resistant) butternut trees for analysis to determine which trees are pure butternut (butternut can hybridize with Japanese walnut). In the winter dormant season scions were collected for grafting onto black walnut rootstock for establishment of the clone banks. This project will be ongoing for many years after the establishment of the clone banks as research and breeding is accomplished to produce canker resistant butternut.

**Effects of Snowmobile Use on Snowpack Chemistry on Vermont Public Lands**
In 2009 a project was initiated to determine if emissions from snowmobile traffic are detectable in seasonal snowpack and runoff, and to investigate whether emission levels tend to diminish rapidly with distance from the snowmobile trails as the emissions disperse into the surrounding watersheds. Snow samples were taken in the winter of 2009-2010, and water runoff samples and soil samples taken in the spring of 2010 for analysis for toxic chemicals.

# 4. ADJUSTMENTS OR CORRECTIONS TO THE FOREST PLAN

Administrative corrections to the Forest Plan are defined at 36 CFR 219.31(b) in the 2000 Planning Rule and may be made at any time. Administrative corrections are not plan amendments or revisions, and do not require public notice or the preparation of an environmental document under Forest Service NEPA procedures. Administrative corrections include the following:

1. Corrections and updates of data and maps,
2. Updates to activity lists and schedules (proposed actions, anticipated outcomes, projected range of outcomes);
3. Corrections of typographical errors or other non-substantive changes; and
4. Changes in monitoring methods other than those required in a monitoring strategy (referring to the requirements for monitoring sustainability criteria in the 2000 rule.)

Corrections ("errata") to the Final Environmental Impact Statement to accompany the Forest Plan are permitted by Forest Service Environmental Policy and Procedures Handbook, FSH 19809.15, Chapter 10, Sections 18.1 and 18.2.

Following release of the 2006 Forest Plan, the staff of the GMNF began gathering information and errors contained within the final documents. In August 2007, the GMNF staff issued three administrative corrections and one errata to the Forest Plan set of documents. The corrections and errata were made available on the following website:
http://www.fs.fed.us/r9/gmfl/nepa_planning/plan_amendments/index.htm

In 2008 an administrative corrections was made to Appendix D to correct average annual allowable sale quantity (ASQ). During the Chief of the USDA Forest Service's review, which was conducted in response to appeals of the GMNF Forest Plan, it was determined that merchantable tops had not been included in the ASQ calculation, and that the ASQ should include that volume, or a rationale for not including them be clearly documented. GMNF staff found that the merchantable tops had been erroneously excluded in the final Forest Plan ASQ figure due to confusion about the definition of the modeling variable Live Cubic Tops (LCT). GMNF staff thought the variable represented unmerchantable tops (0 to 4 inch diameter) when the term LCT actually refers to those merchantable tops with a diameter of 4 inches and greater up to the diameter used for sawtimber. Upon review of this information, GMNF staff determined that the merchantable tops should have been included in the ASQ, and that the merchantable tops had been included in the initial determination of the Long Term Sustained Yield. This is a correction of this data error. There would be no change in acres treated, and there would be no environmental effects. Therefore, this was a non-substantive change. The administrative correction reads:

> The average annual allowable sale quantity of timber (ASQ) is the maximum amount of volume that may be offered and sold during a decade of Forest Plan implementation from land identified for timber management. During Decade 1 (the first ten years of plan implementation), the average annual ASQ on the GMNF is 19.7 million board feet. During Decade 2, the average annual ASQ is 19.7 million board feet. Average annual ASQ means that the amount of timber that may be sold on the Forest in a given year may exceed 19.7 million board feet as long as the decadal ASQ (197 million board feet) is not exceeded.

We will likely issue administrative corrections in the future. Corrections as well as the corrected pages from the set of Plan documents will be posted at the above internet link and we encourage people to use this resource for accessing the most up to date information on administrative corrections. We will continue to provide opportunity for public involvement at the project level and during any substantive changes to the Forest Plan.

There have been no amendments to the revised Forest Plan.

In 2008, GMNF staff began preparing an Environmental Assessment to amend the Forest Plan to reallocate the Wilderness Study Areas, Remote Backcountry Forests, and candidate Research Natural Areas that are remnant areas resulting from designation by Congress of new Wilderness on the GMNF in the 2006 New England Wilderness Act (NEWA).

# 5. LIST OF PREPARERS

The following people collected, evaluated, or compiled data for the fiscal year 2006 Monitoring and Evaluation Report:

| Name | Position |
|---|---|
| Melissa Reichert | Interdisciplinary Team Leader/Forest Planner |
| Diane Burbank | Ecologist |
| Nancy Burt | Soil Scientist |
| Chris Casey | Silviculturist |
| Mary Beth Deller | Botanist |
| Kathleen Diehl | Partnership and Conservation Education Coordinator |
| Pam Gaiotti | Budget and Accounting Officer |
| Rob Hoelscher | Wildlife Biologist |
| John Kamb | Engineer |
| Carol Knight | Environmental Coordinator |
| Dave Lacy | Archaeologist and Heritage Resource Specialist |
| Donna Marks | Landscape Architect |
| Dan McKinley | Wildlife and Fisheries Program Manager |
| Erin Small | Fire Planner |
| Doreen Urquhart | Realty Specialist |
| Chad VanOrmer | Recreation, Wilderness and Heritage Program Manager |
| Diana Wormwood | Law Enforcement Program Assistant |

# APPENDIX A: PAYMENTS TO TOWNS

## Green Mountain National Forest Payments in Vermont

There are two types of federal payments reaching municipalities that have U.S. Forest Service land: 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**. PILT funds are directed to towns, and the Public Law 106-393 funds are directed to school districts.

### PAYMENTS IN LIEU OF TAXES (PILT)

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, this inability to tax the property values or products derived from the federal lands may affect local tax bases significantly. 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 (BLM), 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 takes into account 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.

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 the towns however, are entitled to PILT payments.

Distribution of the PILT in 2009 was made in two payments: the first in June and the second in November.

### SECURE SCHOOLS ACT

The **Secure Rural Schools 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 National Forest System 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 U.S. 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 so as to offer rural school systems continual, level funding. The full distribution for 2009 was made in January of 2010 (see table for 2009).

# PILT and Secure Rural Schools Funding: Vermont Towns

| County | Town | Acres | PILT 2010 | Secure Schools 2010 | PILT 2009 | Secure Schools 2009 |
|---|---|---|---|---|---|---|
| Addison | Bristol | 5528 | 13,204 | Not available until December 2010 | 12,910 | 6,645 |
| Addison | Goshen | 7562 | 18,131 | | 17,727 | 9,089 |
| Addison | Granville | 14895 | 35,461 | | 34,670 | 17,879 |
| Addison | Hancock | 19287 | 46,244 | | 45,212 | 23,183 |
| Addison | Leicester | 2746 | 6,584 | | 6,437 | 3,301 |
| Addison | Lincoln | 11375 | 26,085 | | 25,502 | 13,673 |
| Addison | Middlebury | 3366 | 7,806 | | 7,633 | 4,046 |
| Addison | Ripton | 22204 | 53,230 | | 52,043 | 26,689 |
| Addison | Salisbury | 3830 | 9,183 | | 8,978 | 4,604 |
| Addison Total | | 33425 | 215,928 | | 211,112 | 109,109 |
| Bennington | Arlington | 3333 | 7,991 | | 7,813 | 2,832 |
| Bennington | Bennington | 1292 | 3,098 | | 3,029 | 1,098 |
| Bennington | Dorset | 5577 | 12,918 | | 12,631 | 4,738 |
| Bennington | Glastenbury | 26630 | 35,403 | | 36,552 | 22,624 |
| Bennington | Landgrove | 811 | 1,935 | | 1,892 | 689 |
| Bennington | Manchester | 5503 | 12,961 | | 12,673 | 4,675 |
| Bennington | Peru | 17235 | 41,206 | | 40,288 | 14,642 |
| Bennington | Pownal | 4062 | 9,740 | | 9,522 | 3,451 |
| Bennington | Readsboro | 8304 | 19,911 | | 19,466 | 7,055 |
| Bennington | Rupert | 168 | 642 | | 628 | 143 |
| Bennington | Searsburg | 7632 | 14,349 | | 14,170 | 6,484 |
| Bennington | Shaftsbury | 1353 | 4,920 | | 4,770 | 1,164 |
| Bennington | Stamford | 11823 | 28,347 | | 27,716 | 10,044 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Bennington | Sunderland | 21932 | 52,471 | | 51,300 | 18,632 |
| Bennington | Windhall | 15918 | 37,912 | | 37,066 | 13,523 |
| Bennington | Woodford | 26752 | 60,063 | | 58,725 | 22,727 |
| Bennington Total | | 63076 | 343,867 | | 338,241 | 134,521 |
| Essex | Granby | 1660 | 3,980 | | 3,891 | 3,870 |
| Essex Total | | 1660 | 3,980 | | 3,891 | 3,870 |
| Rutland | Brandon | 89 | 214 | | 209 | 97 |
| Rutland | Chittenden | 29409 | 70,513 | | 68,940 | 32,202 |
| Rutland | Killington | 1791 | 9,147 | | 8,944 | 1,961 |
| Rutland | Mendon | 3203 | 6,652 | | 6,502 | 3,507 |
| Rutland | Mt. Holly | 3360 | 8,056 | | 7,876 | 3,680 |
| Rutland | Mt. Tabor | 25117 | 31,922 | | 31,332 | 27,502 |
| Rutland | Pittsfield | 7698 | 18,457 | | 18, 045 | 8,429 |
| Rutland | Wallingford | 8560 | 21,747 | | 21,262 | 9,373 |
| Rutland Total | | 65673 | 166708 | | 163,110 | 86751 |
| Washington | Warren | 7224 | 16,973 | | 16,594 | 6,690 |
| Washington Total | | 7224 | 16,973 | | 16,594 | 6,690 |
| Windham | Dover | 5640 | 13,523 | | 13,221 | 5,718 |
| Windham | Jamaica | 720 | 3,451 | | 3,373 | 730 |
| Windham | Londonderry | 437 | 1,683 | | 1,646 | 443 |
| Windham | Somerset | 9423 | 12,287 | | 12,700 | 9,553 |
| Windham | Stratton | 18238 | 26,924 | | 26,294 | 18,490 |
| Windham | Wardsboro | 3,104 | 7,443 | | 7,276 | 3,147 |
| Windham | Wilmington | 1750 | 4,196 | | 4,103 | 1,774 |
| Windham Total | | 28732 | 69,507 | | 68,613 | 39,855 |
| Windsor | Rochester | 12600 | 30,197 | | 29,523 | 11,152 |
| Windsor | Stockbridge | 810 | 1,949 | | 1,906 | 717 |
| Windsor | Weston | 9104 | 21,829 | | 21,341 | 8,057 |
| Windsor Total | | 9104 | 53,975 | | 52,770 | 19,926 |

# APPENDIX B: REGIONAL FORESTER SENSITIVE SPECIES, RARE OR UNCOMMON NATURAL COMMUNITIES, AND NON-NATIVE INVASIVE SPECIES

**GMNF Regional Forester Sensitive Species (RFSS): Plants, 2007**

*Agrostis mertensii*
*Asclepias exaltata*
*Aureolaria pedicularia var. pedicularia*
*Blephilia hirsuta*
*Calamagrostis stricta ssp. inexpansa*
*Cardamine parviflora var. arenicola*
*Carex aestivalis*
*Carex aquatilis var. substricta*
*Carex argyrantha*
*Carex backii*
*Carex bigelowii ssp. bigelowii*
*Carex foenea*
*Carex haydenii*
*Carex lenticularis var. lenticularis*
*Carex michauxiana*
*Carex schweinitzii*
*Carex scirpoidea*
*Ceratophyllum echinatum*
*Clematis occidentalis var. occidentalis*
*Collinsonia canadensis*
*Conopholis americana*
*Cryptogramma stelleri*
*Cynoglossum virginianum var. boreale*
*Cypripedium parviflorum var. pubescens*
*Cypripedium reginae*
*Desmodium paniculatum*
*Diplazium pycnocarpon*
*Draba arabisans*
*Dryopteris filix-mas*
*Eleocharis intermedia*
*Eleocharis ovata*
*Equisetum pratense*
*Eupatorium purpureum*
*Galium kamtschaticum*
*Geum laciniatum*
*Hackelia deflexa var. americana*
*Helianthus strumosus*
*Huperzia appalachiana*
*Isotria verticillata*
*Juglans cinerea*
*Juncus trifidus*
*Lespedeza hirta*
*Muhlenbergia uniflora*
*Myriophyllum farwellii*
*Nabalus trifoliolatus (=Prenanthes trifoliolata)*
*Panax quinquefolius*
*Peltandra virginica*
*Phegopteris hexagonoptera*
*Pinus rigida*
*Plantago americana (=Littorella uniflora)*
*Platanthera orbiculata*
*Polemonium vanbruntiae*
*Potamogeton bicupulatus*
*Potamogeton confervoides*
*Potamogeton hillii*
*Pyrola chlorantha*
*Pyrola minor*
*Quercus muehlenbergii*
*Rhodiola rosea (=Sedum rosea)*
*Saxifraga paniculata ssp. neogaea*
*Scheuchzeria palustris*
*Selaginella rupestris*
*Sisyrinchium angustifolium*
*Sisyrinchium atlanticum*
*Solidago patula*
*Solidago squarrosa*
*Stellaria alsine*
*Utricularia resupinata*
*Uvularia perfoliata*
*Vaccinium uliginosum*
*Woodsia glabella*

**Rare or Uncommon Natural Communities Recognized as Significant by the GMNF 2006 Forest Plan FEIS: Table 3.11-6**

**South Half GMNF**

| Site Name | 2006 Plan Management Area Designation |
|---|---|
| **Beebe Pond** | Ecological Special Area |
| **Big Branch** | Wilderness. |
| **Big Mud Pond** | Wilderness. |
| **Bourn Pond** | Wilderness. |
| **Branch Pond** | Ecological Special Area |
| **Colebrook Trail Swamp** | Escarpment |
| **Devil's Den** | White Rocks NRA |
| **Downer Glen** | Wilderness. |
| **Fifield Pond** | White Rocks NRA |
| **French Hollow** | Ecological Special Area |
| **Glastenbury Mountain** | Wilderness Study Area |
| **Green Mountain Ridge** | White Rocks NRA |
| **Griffith Lake** | White Rocks NRA |
| **Grout Pond** | Ecological Special Area |
| **Little Mud Pond** | Wilderness. |
| **Little Pond** | Wilderness Study Area |
| **Little Rock Pond** | White Rocks NRA |
| **Lost Pond Bog** | Wilderness. |
| **Lye Brook Headwaters** | Remote Backcountry |
| **Lye Brook Ledge** | Wilderness. |
| **McGinn Brook** | Wilderness. |
| **Moses Pond** | Diverse Forest Use |
| **Mt. Tabor Work Center Swamp** | Ecological Special Area |
| **Peabody Hill** | Ecological Special Area |
| **Somerset Fen** | Ecological Special Area |
| **Stamford Meadows** | Ecological Special Area |
| **Stamford Stream Wetland Complex** | Ecological Special Area |
| **Stratton Mountain** | Ecological Special Area |
| **The Burning** | Wilderness. |
| **Thendara Camp Fen** | Ecological Special Area |
| **Wallingford Pond** | White Rocks NRA |
| **West of Mt. Tabor** | Wilderness. |
| **West River Headwater Cove** | Diverse Forest Use |
| **White Rocks** | White Rocks NRA |
| **Winhall River Headwater Flowage** | Wilderness/Remote Backcountry |

**North Half GMNF**

| Site Name | 2006 Plan Management Area Designation |
|---|---|
| **Beaver Meadows and Abbey Pond** | Ecological Special Area |
| **Blue Ridge Fen** | Candidate Research Natural Area |
| **Breadloaf Mountain** | Wilderness. |
| **Bristol Cliffs** | Wilderness/Escarpment |
| **Bryant Mountain** | Escarpment |
| **Bryant Mountain Hollow** | Ecological Special Area |
| **Burnt Mountain** | Escarpment |
| **Chandler Ridge** | Escarpment |
| **Crystal Brook Glacial Kettle** | Wilderness. |
| **Dutton Brook Swamp** | Ecological Special Area |
| **Elephant Mountain** | Ecological Special Area |
| **Gilmore Pond** | Wilderness. |
| **Hat Crown/Silent Cliff** | Wilderness. |
| **Leicester Hollow** | Eligible Scenic River |
| **Lincoln Ridge** | Alpine Subalpine Special Area |
| **Middlebury Gap** | Wilderness Study Area |
| **Monastery Mountain** | Wilderness Study Area |
| **Mount Abraham** | Alpine Subalpine Special Area |
| **Mount Moosalamoo** | Escarpment |
| **Mt. Horrid** | cRNA |
| **Mt. Roosevelt to Mt. Wilson** | Wilderness. |
| **North Pond** | Diverse Backcountry Forest |
| **Rattlesnake Point** | Ecological Special Area |
| **Skylight Pond** | Wilderness. |
| **Texas Falls** | Ecological Special Area |
| **The Cape** | Research Natural Area |

**Additional Rare or Uncommon Natural Communities on GMNF-administered lands identified by the Vermont Non-game and Natural Heritage Program as Significant**

| Site Name | 2006 Plan Management Area Designation |
|---|---|
| **Bald Mountain (S)** | Wilderness |
| **Dana Hill Pool** | AT |
| **Griggs Mountain** | AT |
| **Happy Hill Pool** | AT |
| **Jenny Coolidge Wetland (S)** | Diverse Forest Use |
| **Jones Brook (S)** | Diverse Forest Use |
| **Killington/Little Killington Peaks** | AT |
| **Lincoln Gap (N)** | Diverse Backcountry Forest |
| **Lottery Road Swamp** | AT |
| **Mosley Hill Pool** | AT |
| **Mud Pond-Peru (S)** | Diverse Forest Use |
| **Pico Peak** | AT |
| **Stamford Pond (S)** | Diverse Backcountry Forest |
| **Stratton Meadow Bog (S)** | Wilderness |
| **Thistle Hill** | AT |
| **Totman Hill Fen** | AT |

**Green Mountain National Forest Non-native Invasive Species List**[i]

The GMNF non-native invasive species (NNIS) list includes the "Class B" portion of the Vermont Quarantine list, one species from the Federal Noxious Weed list, and six species from the State Watch List. These species are tracked during surveys of NNIS; they are species for which we would consider management actions.

To see the entire Vermont Quarantine rule and list, the State Watch List, and fact sheets for all species listed go to:
http://www.vtinvasiveplants.org/

**GMNF NNIS LIST**

| Scientific Name | Common Name | National I-Rank[1] |
|---|---|---|
| **Species listed in federal noxious weed legislation** | | |
| *Heracleum mantegazzianum* | giant hogweed | Medium/Low |
| **"Class B" Noxious Weeds:** any noxious weed that is not native to the state, is of limited distribution statewide, and poses a serious threat to the State, or any other designated noxious weed being managed to reduce its occurrence and impact in the State. | | |
| *Aegopodium podagraria* | goutweed | Medium/Insignificant |
| *Ailanthus altissima* | tree-of-heaven | Medium/Low |
| *Alliaria petiolata* | garlic mustard | High/Medium |
| *Butomus umbellatus* | flowering rush | Medium/Low |
| *Celastrus orbiculatus* | Oriental bittersweet | High/Medium |
| *Hydrocharis morsus-ranae* | frogbit | |
| *L. maackii, L. morrowii, L. tatarica, & L. x bella* | Shrubby honeysuckles (amur, morrow, tatarian, & Bell's honeysuckle) | |
| *Lonicera japonica* | Japanese honeysuckle | High/Medium |
| *Lythrum salicaria* | purple loosestrife | |
| *Myriophyllum spicatum* | Eurasian watermilfoil | High |
| *Nymphoides peltata* | yellow floating heart | |
| *Phragmites australis* | common reed | |
| *Polygonum cuspidatum* | Japanese knotweed | |
| *Potamogeton crispus* | curly leaf pondweed | Medium |
| *Rhamnus cathartica* | common buckthorn | High/Medium |
| *Rhamnus frangula* | glossy buckthorn | |
| *Trapa natans* | water chestnut | Medium |
| *Vincetoxicum nigrum (=Cynanchum louiseae)* | black swallow-wort | |

[1] National I-Ranks are from NatureServe (2005) and are based on an assessment of invasiveness. Species w/out ranks have not yet been assessed.

**List of Watch Species**

| Scientific Name | Common Name | National I-Rank[1] |
|---|---|---|
| *Acer platanoides* | Norway maple | High/Medium |
| *Anthriscus sylvestris* | wild chervil | |
| *Berberis thunbergii* | Japanese barberry | High/Medium |
| *Berberis vulgaris* | common barberry | |
| *Centaurea biebersteinii = C. maculosa* | spotted knapweed | High/Medium |
| *Rosa multiflora* | multiflora rose | Medium/Low |

| **Species listed in federal noxious weed legislation** | |
|---|---|
| *Heracleum mantegazzianum* | Giant hogweed |
| **Class A Noxious Weeds[ii]** | |
| *Cabomba caroliniana* | fanwort |
| *Egeria densa* | Brazilian elodea |
| *Hydrilla verticillata* | hydrilla |
| *Hygrophila polysperma* | E. Indian hygrophila |
| *Myriophyllum aquaticum* | Parrot feather |
| *Myriophyllum heterophyllum* | variable-leaved milfoil |
| *Salvinia auriculata* | giant salvinia |
| *Salvinia biloba* | giant salvinia |
| *Salvinia herzogii* | giant salvinia |
| *Salvinia molesta* | giant salvinia |
| *Vincetoxicum hirundinaria* | pale swallow-wort |
| **Class B Noxious Weeds[iii]** | |
| *Aegopodium podagraria* | goutweed |
| *Ailanthus altissima* | tree-of-heaven |
| *Alliaria petiolata* | garlic mustard |
| *Butomus umbellatus* | flowering rush |
| *Celastrus orbiculatus* | Oriental bittersweet |
| *Hydrocharis morsus-ranae* | frogbit |
| *Lonicera x bella* | Bell honeysuckle |
| *Lonicera japonica* | Japanese honeysuckle |
| *Lonicera maackii* | Amur honeysuckle |
| *Lonicera morrowii* | Morrow honeysuckle |
| *Lonicera tatarica* | tatarian honeysuckle |
| *Lythrum salicaria* | purple loosestrife |
| *Myriophyllum spicatum* | Eurasian watermilfoil |
| *Nymphoides peltata* | yellow floating heart |
| *Phragmites australis* | common reed |
| *Polygonum cuspidatum* | Japanese knotweed |
| *Potamogeton crispus* | curly leaf pondweed |
| *Rhamnus cathartica* | common buckthorn |
| *Rhamnus frangula* | glossy buckthorn |
| *Trapa natans* | water chestnut |
| *Vincetoxicum nigrum (=Cynanchum louiseae)* | black swallow-wort |

[i] The GMNF list is based on the Noxious Weed Quarantine Rule created in 2002 by the Vermont Agency of Agriculture, Food and Markets. The Noxious Weed Quarantine Rule has the force of law. It was created to regulate the importation, movement, sale, possession, cultivation and/or distribution of 32 invasive plants.

[ii] "Class A Noxious Weed" means any noxious weed on the Federal Noxious Weed List (7 C.F.R. 360.200), or any noxious weed that is not native to the State, not currently known to occur in the State, and poses a serious threat to the State.

[iii] "Class B Noxious Weed" means any noxious weed that is not native to the state, is of limited distribution statewide, and poses a serious threat to the State, or any other designated noxious weed being managed to reduce its occurrence and impact in the State.