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Green Mountain National Forest

Annual Monitoring and Evaluation Report

Fiscal Year 2008



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Annual Monitoring and Evaluation Report

Green Mountain National Forest

USDA Forest Service
Eastern Region
Milwaukee, Wisconsin
April 2009

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Executive Summary

This is the third 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 three 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 2008, the GMNF staff monitored 58 items covering 20 areas. Highlights of these monitoring efforts include:

- Partnerships and volunteers contributed a total value of \$663,179 through formal and volunteer agreements
- 303 volunteers provided 32,544 hours of service
- 19 teachers completed a Forest for Every Classroom and the Forest for Every Classroom Fellows program was created to serve past participants
- 675,000 board feet were harvested
- 4.5 million board feet were offered and sold
- 18 recreation facilities and 13.9 miles of trails were surveyed for deferred maintenance
- 3 Wilderness areas, totaling 32,157 acres, were managed to national standard
- 33 culverts were inventoried in new Wilderness areas
- The condition of 40 known heritage sites in project areas was monitored
- Soil, water and riparian resource monitoring data for harvest areas was compiled and evaluated

- 19 sites in 15 streams were monitored for Atlantic salmon with an average of 908 juvenile salmon per mile
- 9 sites in 5 streams were monitored for temperature with all falling within the desired temperature range for fish habitat
- One fish and aquatic organism passage improvement project was monitored showing many benefits were achieved
- 675 acres of existing openings were enhanced and/or maintained and over 1,500 acres of openings were monitored
- High peaks monitoring for Bicknell's Thrush was conducted on the GMNF in conjunction with Mountain Birdwatchj
- 40 plant species (69 populations) on the Regional Forester Sensitive Species (RFSS) list were monitored on the GMNF
- A cooperative Weed management area was initiated in the Upper White River subwatershed to increase NNIS monitoring and control in the area
- 350 permits were issued for collection of Special Forest Products including firewood, maple tapping, and Christmas trees
- 19 sites with special features were monitored including several areas in Wilderness
- 4 human caused wildfires on approximately 14 acres were suppressed
- 133 acres were treated for hazardous fuels

Key Events and Achievements in Fiscal Year 2008

Flood Damage and Repairs

Flooding from heavy rains damaged roads and bridges in several towns in Addison and Windsor counties in August of 2008. The GMNF staff worked with the towns and contractors to repair more than 4.5 miles of roadway damaged during the floods and planned for future flood repair work to roads and trails.

Long-term Ecosystem Monitoring

In 2008, GMNF staff established and collected data at the first five Long-term Ecosystem Monitoring plots. Data collection at each plot consisted of describing the local landscape and soils, collecting soil samples for laboratory chemical analysis, and characterizing the vegetative community (trees, shrubs, forbs and lichens). Data from these plots will be pooled with similar data from New England to track change in forest composition, forest health, and soil quality over the next fifty years. In the coming decades it will be increasingly important for forest managers to know if and how the forest is changing, in response to factors such as climate change, acid deposition, and non-native invasive species. The Long-term Ecosystem Monitoring Project has several cooperators including the project co-leader -- Forest Service Northern Research Station, the Natural Resource Conservation Service, State of Vermont - Department of Forests, Parks and Recreation, and the Vermont Monitoring Cooperative.

Natural Turnpike Integrated Resource Project

The GMNF staff continued Integrated Resource Project (IRP) implementation and planning. The Natural Turnpike IRP decision was signed in March of 2008. The project, located in the towns of Ripton and Lincoln, is designed to: maintain public access and a safe public transportation system, provide year-round quality recreational opportunities and improve wildlife and fish habitat. The Catamount Trail reroute was begun in the summer of 2008 and other projects are expected to begin in 2009 and continue for a number of years. 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.

Upper White River Integrated Resource Project

The Upper White River IRP moved into the collaboration phase in 2008. The purpose of collaboration with the public was to: display information/data gathered to date, identify past activities that have taken place in project area, gather local knowledge and ideas for site-specific desires, and work on developing purpose and need for suggested activities. Work groups were established for heritage; natural resources; and recreation, wilderness and transportation. Meeting and field visits were held on these topics.

Stewardship Contracts

The Beattie Road stewardship contract was implemented in the town of Landgrove in 2008. The project released aspen, improved ruffed grouse habitat and cleared vegetation from old cellar holes. Stewardship contracts blend the needs of the community with the forest management activities by trading forest products, or goods, for restoration work, or services.

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. Information about planning our projects and project contacts can be found on the Internet at: www.fs.fed.us/r9/gmfl/nepa_planning/index.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/ Margaret Mitchell*_____

Date: 9/30/09

MARGARET MITCHELL
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 2008 (October 1, 2007-September 30, 2008), hereafter referred to as FY08. 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 FY08.

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 FY08.

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.

Formal Agreements: During FY08, there were a total of 25 signed grants and agreements and 40 modifications that provided or obligated \$663,179 worth of cash, goods, and services to the GMFL from partners, and \$380,579 worth of cash, goods, and services to partners from the GMFL.

Volunteer Agreements: In FY08, 303 volunteers provided 32,544 hours of service at an appraised value of \$634,935 to the Green Mountain and Finger Lakes National Forests.

Total to the Forest: Including formal and volunteer agreements, partners gave a total value of \$1,298,114 to the GMFL in FY08. This includes:

- cash contributions of over \$562,498
- in-kind contributions of over \$735,615
- non-cash contributions of over \$100,681

Total to Partners: Contributions also went to various partners for the work they provided to support the GMFL. In FY08, there was over \$369,767 in funds and over \$10,812 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: GMNF staff continues to maintain strong partnerships with the Department of Defense (DOD), local community fire departments and the State of Vermont.

The GMNF staff maintains agreements with the U.S. Army Environmental Center (State and Private Forestry-NA) for Ft. Drum (Army) in New York, Westover Air Reserve Base (Air Force) in Massachusetts, and cooperates with the White Mountain National Forest on an agreement with New Boston Air Force Station in New Hampshire. Although each has separate agreements, the scope of work is similar: to plan and implement prescribed burns for the reduction of hazardous fuels; and to provide fire training to DOD employees. These partnerships are mutually beneficial. The Department of Defense supplements funding for the USFS fire program, and project implementation provides good experience and training opportunities to all fire personnel.

The GMNF staff also maintains numerous agreements and partnerships with Volunteer Fire Departments (VFD) and a Mutual Aid Association. These agreements provide means for reimbursement if suppression support is needed on wildland fire incidents on the GMNF, and aid in the preparedness planning across the GMNF. The following tables displays the VFD's under agreement and the location on the GMNF in which the agreement serves.

GMNF District	Fire Department
North	Bristol Fire Company
North	Chittenden VFD
North	Dunmore Hose Company (BRANDON)
North	Goshen VFD
North	Granville VFD
North	Hancock VFD
North	Lincoln VFD
North	Middlebury , Town of, Fire Dept
North	Pittsfield VFD
North	Ripton VFD
North	Rochester VF Company
North	Salisbury VFD
North	Sherburne VFD
North	Stockbridge VFD
North	Warren VF Company
South	Arlington Fire Dept.
South	Bennington County Mutual Aid Association
South	Dorset VFD
South	East Dorset VFD
South	East Wallingford VF Company
South	Manchester Fire Company

South	Peru VFD
South	Phoenix No. 6 Fire Company (Londonderry)
South	Readsboro VFD
South	Rupert VFD
South	Shaftsbury Fire Dept
South	Stamford VF Company
South	Stratton Fire Dept
South	Wallingford Fire Dept #1
South	Weston Fire Company
South	Wilmington, Town of
South	Winhall Fire Dept

The FS also maintains an agreement with the Northeast Forest Fire Protection Compact for interagency fire planning benefits. GMNF staff participates on an on-going basis with a variety of working teams within the compact. The FS is also part of a three way Cooperative Fire agreement with the State of Vermont and the USFWS that provides numerous benefits relating to coordination and collaboration on fire preparedness, suppression, and other fire management activities.

Monitoring Activities: Management of the agreements is continuous and on-going requiring coordination with all parties within the agreement and attention to policy changes. In FY08, the GMNF staff began the process of rewriting agreements to a new template requiring updates every 5 years and an annual operating plan. Through the DOD agreements, GMNF staff provided hazardous fuels project planning, and implementation for Fort Drum Military installation.

In FY2008, communications with The Nature Conservancy (TNC) in New York resulted in the development of a prescribed fire and fuels Memorandum of Understanding (MOU) between the two agencies. This MOU allows for the exchange of personnel and resources for implementing prescribed burning on the GMNF and TNC lands.

Evaluation and Conclusions: Partnership agreements provide valuable services that help the FS achieve desired management objectives. It is essential that agreements be kept current.

Recommendations: 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, two professional development opportunities occurred in FY08 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.

When the year-long program is over, the 15 teachers, through the partnership, continue to be offered:

- the 30 teachers in New Hampshire. A "tool kit" was also produced to share with other Additional natural resource-based courses in a reunion setting
- Scholarship help for other natural- and cultural-resource conferences and workshops
- Small grants for classroom service-learning projects

In 2008, *A Forest for Every Classroom Fellows Program* was established by the partners and offered to the 105 teachers who have completed the program in Vermont and national and state forests and parks who might be interested in replicating or adapting this program. The tool kit is a "how to" set up a similar program. Replication of *A Forest For Every Classroom* is currently being done in New Hampshire (2006), Texas (2008), and

Montana (2009/2010). **A Trail to Every Classroom**, (2006) in communities along the Appalachian Trail, is an adaption of this program.

Partners: Green Mountain National Forest, Marsh-Billings-Rockefeller National Historical Park, Conservation Studies Institute, Shelburne Farms, National Wildlife Federation.

In February 2008, an additional 19 teachers completed Vermont's **A Forest For Every Classroom**. Since 2001, a total of 105 teachers have completed it.

- 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. In 2008, the **Vermont Envirothon** was recognized with the "Two Chief's (Natural Resources Conservation Service and Forest Service) Award for Partnerships" because of the diversity of partners who plan and implement the program and how organic the planning committee is in bringing in new partners as needed for the environmental issues studied every year.

For 14 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 2008, 17 Vermont schools participated in the Vermont Envirothon totaling 137 students and educators who participated.

One other noteworthy item in Conservation Education is the national (indeed international) movement to establish programs and projects that reconnect families and especially kids to nature. There is general agreement with federal, state, local agencies and groups that with all the electronic medium, including television, computers, texting telephones, video games, etc. that kids so aptly use in today's world, they have become disconnected with the natural world.

The Forest Service established "**More Kids in the Woods**" with two outreaches of grant money for projects that get kids in the woods. Also, **No Child Left Inside** (NCLI) legislation passed in Congress in 2008 with active encouragement from a nationwide coalition. The GMNF staff is working with Vermont Forests Parks and Recreation to establish a NCLI website, as well as

potential programs to let families and kids know about things like nature clubs, state and federal forests and parks, and other creative ideas to get people to go outside with their kids. Several lectures were given to senior citizen groups about taking their grandkids outside.

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 2008. These outputs are displayed in Table 2.1-2 Estimated and Actual Outputs Achieved in Fiscal Year 2008.

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 sited identified; trails improved; local, arterial and collector roads maintained; roads decommissioned; wildlife openings mowed and wildlife habitats improved; and stream and lake habitats restored. Over-reaching the estimates will benefit the maintenance, improvement and protection of these resources. Although timber volume is less than estimated, both the amount harvested, and the amount offered and sold have increased. This will increase the amount of acres of vegetation treatment in the future.

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 2008 Forest Plan Appendix D, Proposed and Probable Practices					
Activity or Practice	Unit of Measure	Estimated Amount (Decade 1)*	Actual Amount Achieved in FY08	Actual Amount Achieved since 2006	Average amount achieved per year Since 2006
Heritage Resource Protection					
Inventoried Acres	Acres	2,000 to 4,000	15815	21315	10657.5
New Sites Identified	Sites	10 to 40	40	65	32.5
New Sites Evaluated	Sites	2 to 7	0	0	0
Sites Monitored	Sites	30 to 60	30	100	50
Recreation Resources					
Trail Improvement	Miles	10 to 20	9	14	7
Trail Rehabilitation	Miles	200 to 400	NA	0	0
Trail Maintenance	Miles	9,050	370	492	246
Wilderness Managed**	Areas	30 to 50	3	5	2.5
Roads Management					
Rights-of-Way Acquisition	Rights-of-Ways	40	1	2	1
Maintain Local Roads	Miles	100 to 200	79.60	168.1	84.05
Restore Local Roads	Miles	10 to 20	0.30	0.3	0.15
Reconstruct Local Roads	Miles	5 to 10	0	0	0
Construct Local Roads	Miles	0 to 5	0.10	0.1	0.05
Maintain Arterial and Collector Roads***	Miles	40 to 80	21.56	47.86	23.93
Decommission Local Roads	Miles	5 to 10	5.95	5.95	2.975
Vegetation Management					
Hardwood Selection Cuts	Acres	8,366	241	241	120.5
Hardwood/Oak Shelterwood Regeneration	Acres	11,496	65	68	34
Hardwood/Oak Shelterwood Removal	Acres	3,240	0	37	18.5
Hardwood Clearcut	Acres	2,376	15	15	7.5
Hardwood/Oak Thin	Acres	9,000	115	143	71.5
Hardwood Stand Improvement	Acres	2,650	80	80	40
Softwood Shelterwood	Acres	2,814	22	32	16

Table 2.1-2 Estimated and Actual Outputs Achieved in Fiscal Year 2008 Forest Plan Appendix D, Proposed and Probable Practices					
Activity or Practice	Unit of Measure	Estimated Amount (Decade 1)*	Actual Amount Achieved in FY08	Actual Amount Achieved since 2006	Average amount achieved per year Since 2006
Regeneration					
Softwood Selection Cuts	Acres	1,444	138	138	69
Softwood Clearcut	Acres	10	0	2	1
Softwood Thin	Acres	1,000	0	2	1
Softwood Stand Improvement	Acres	700	43	43	21.5
Softwood Planting	Acres	350	0	0	0
Release Softwood from Hardwoods	Acres	1,700	0	0	0
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	15	15	7.5
Total Selection Cuts	Acres	9,810	379	379	189.5
Total Shelterwood Regeneration	Acres	14,310	87	100	50
Total Shelterwood Removals	Acres	3,240	0	37	18.5
Total Clearcut	Acres	3,347	15	17	8.5
Total Thin	Acres	10,000	127	157	78.5
Total Stand Improvement	Acres	3,350	123	225	112.5
Total Release	Acres	1,700	0	0	0
Total Planting	Acres	850	0	29	14.5
Hardwood Sawtimber Cut	MMBF	110	1.139	1.349	0.6745
Softwood Sawtimber Cut	MMBF	10	0.713	0.859	0.4295
Combined Sawtimber	MMBF	120	1.852	2.208	1.104
Hardwood Roundwood Cut	MMBF	41	1.381	1.649	0.8245
Softwood Roundwood Cut	MMBF	3	0.455	0.507	0.2535
Combined Roundwood	MMBF	44	1.836	2.155	1.0775
Total Timber Cut	MMBF	164	3.877	4.552	2.276
Monitor condition of sites and species	Sites	All	5	9	4.5

Table 2.1-2 Estimated and Actual Outputs Achieved in Fiscal Year 2008 Forest Plan Appendix D, Proposed and Probable Practices					
Activity or Practice	Unit of Measure	Estimated Amount (Decade 1)*	Actual Amount Achieved in FY08	Actual Amount Achieved since 2006	Average amount achieved per year Since 2006
under special forest product permits					
Rare or Outstanding Ecological Resources					
Monitor known rare or outstanding ecological, biological, or geological features	Sites	All (129+)	19 sites with special features	33	16.5
Inventory for TES species and rare or outstanding natural communities	Acres	4,000	378 acres inventoried for RFSS plants	1127.7	563.85
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 plant populations protected	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	No restoration work completed for plants; 1 administrative study begun	0	0
Protect important habitat sites for TES bats	Hibernacula	All hibernacula	1	0	.5
Protect important habitat sites for TES bats	Roost and den trees	Adequate numbers of roost and den trees	Reserve trees marked at all sites where vegetation prescriptions were implemented	Reserve trees marked at all sites where vegetation prescriptions were implemented	Reserve trees marked at all sites where vegetation prescriptions were implemented
Protect nesting TES bird species from disturbance	Active nest sites	All	2	4	2
Monitor known occurrences of TES species	Sites /Populations	All	69 out of about 180	384	192
Update conservation	Species	All	0 for plants	0	0

Table 2.1-2 Estimated and Actual Outputs Achieved in Fiscal Year 2008 Forest Plan Appendix D, Proposed and Probable Practices					
Activity or Practice	Unit of Measure	Estimated Amount (Decade 1)*	Actual Amount Achieved in FY08	Actual Amount Achieved since 2006	Average amount achieved per year Since 2006
assessments for RFSS					
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	491	1146	573
Non-Commercial Clearcutting of Aspen and Paper Birch	Acres	2,000	120	120	60
Burn Upland Wildlife Openings	Acres	5,000	315	335	167.5
Burn Marshes	Acres	250	0	0	0
Other Wildlife Habitat Improvement	Acres	250	134	224	112
Stream Habitat Restored/improved	Miles	50	7	13	6.5
Lake Habitat Restored/Enhanced	Acres	10	2	52	26
Fish Habitat Monitored	Sites	80	8	15	7.5
Fish Passage Restored	Road Crossing	10	1	1	0.5
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 FY07 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 3.65 million board feet (MMBF) or 5,903 hundred cubic feet (CCF) of sawtimber and pulpwood in FY 2008, roughly 15%-19% 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 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 2009, GMNF staff plans to offer five timber sales of various sizes along with firewood permits for a total of roughly 5.0 MMBF (8,000CCF). 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:

Estimates of Management Practices	Annual Acres in Decade 1 Acres	Acres Completed FY 2008	% of Annual Acres
Even-aged Regeneration Harvest	1,750	102	5.8
Even-aged Intermediate Harvest	1,324	238	18.0
Uneven-aged Harvest	981	379	40.6
Total Harvest	4,055	598	17.7

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 08 Target Accomplishments and Estimated Cost		
TARGET ACTIVITY	AMOUNT ACCOMPLISHED	ESTIMATED COST
Inventory and Monitoring		
Annual monitoring requirements completed	14 items	\$42,630
Inventory data collected or acquired to standard	23,380 acres	\$64,973
Forest Planning		
Amendments Underway	1	\$41,325
Facilities		
Forest administrative and other facilities maintained to standard	30 facilities	\$61,849
Recreation sites managed to standard	99 sites	\$93,247
Hazardous Fuels		
Treated to reduce the risk of catastrophic wildland fire	7350 acres	\$121,092
Lands		
Land Acquisitions/adjustments	528 acres	\$245,563
Boundaries marked	14 miles	\$116,749
Non Recreation Special use permits administered to standard	26 permits	\$46,955
Non Recreation Special use applications processed	14 applications	\$61,261
Rights Of Way acquired	1 easement	\$5,000
Vegetation and Watershed		
Forest vegetation established	100 acres	\$4,027
Timber stand & genetic tree improvement	102 acres	\$39,876
Treated annually for noxious weeds and invasive plants	1,337 acres	\$66,438
Range land vegetation improved	1,050 acres	\$25,859
Soil and Water resource acres improved	21 acres	\$15,000
Wildlife, Fish and Threatened, Endangered and Sensitive Species		
Lake habitats restored or enhanced	45 acres	\$22,262
Stream habitats restored or enhanced	98 miles	\$147,849
Terrestrial habitats restored or	433 acres	\$237,166

Table 2.1- 4: Fiscal Year 08 Target Accomplishments and Estimated Cost		
enhanced		
Range		
Grazing allotments managed to 100% standard	4,964 acres	\$84,043
Recreation		
Heritage assets managed to standard	20 assets	\$35,000
Recreation site capacity operated to Standard	160,000 PAOT days	\$208,121
Number of interpretive and conservation education plans implemented	1 Plan	\$24,872
Recreation special use authorizations administered to standard	19 permits	\$63,321
Trails improved to standard	12 miles	\$121,019
Trails maintained to standard	385 miles	\$284,460
Wilderness Areas managed to standard	1 areas	\$77,458
Roads		
Roads decommissioned	6 miles	\$16,100
High clearance roads maintained	14 miles	\$35,000
Passenger car roads improved	0 mile	0
Passenger car roads maintained	65.9 miles	\$326,700
Lands covered by motor vehicle use map (MVUM) – includes development of the GM MVUM	16,212 acres	\$51,583
Timber		
Timber volume sold	5649 ccf	\$490,755

Monitoring Activities: Table 2.1-4 displays the targets that were achieved on the Green Mountain and Finger Lakes National Forests in 2008, 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 FY08 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:

- Greendale Priory and Peabody Timber Sales
- Nordic Beattie Road Stewardship Sale
- Dutton Brook II Timber Sale
- Bromley Brook NNIS Removal
- Aquatic Passage Restoration projects at Sucker Brook Trailhead on FR 67 and Lake Brook on FR 30
- Snowmobile trail Relocations at Mount Tabor and Liberty Hill
- Backcountry Privy Replacements
- Little Michigan Brook Ski Trail Relocation
- Research and monitoring project Coordination
- Maple Tapping Permits
- Access permits

Evaluation and Conclusions:

1. Greendale Priory and Peabody Timber Sales
Deer wintering habitat was improved through group tree selection to stands that are primarily a softwood and hardwood mix with good softwood regeneration. The temporary openings created were less than an acre (generally less than 1/4 acre) in size allowing sufficient sunlight to enhance softwood growth.
2. Dutton Brook II Timber Sale
This sale improved growing conditions in hardwood, softwood and oak forests. New young stands were regenerated, and early successional wildlife habitat was established. Temporary and permanent openings were created and patches of wild apple trees were maintained. The project is in the Moosalamoo NRA MA. The timber sale will move the MA closer to desired future conditions for vegetation composition, age-class distribution, and wildlife habitat diversity. The sale provided high quality sawtimber, pulpwood, and employment. This sale is not completed.
3. Nordic Beattie Road Stewardship Sale
The project released aspen, improved ruffed grouse habitat and cleared vegetation from old cellar holes. Stewardship contracts blend the needs of the community with the forest management activities by trading forest products, or goods, for restoration work, or services.
4. Bromley Brook NNIS Removal
This project removed three non-native invasive species (NNIS), oriental bittersweet, buckthorn, and Morrow honeysuckle by manual means (pulling by hand or with the aid of hand tools) or girdled. Removal occurred along Bromley Brook in the vicinity of the

Manchester Ranger District administrative site, and on the grounds of the administrative site. Pulled plants were appropriately destroyed and disturbed soil was replanted with native grasses and shrubs.

5. Aquatic Passage Restoration projects at Sucker Brook Trailhead on FR 67 and Lake Brook on FR 30

Sucker Brook has been prone to seasonal flooding causing the road to washed out several times. The culvert on the downstream side was approximately 3-4 feet above the brook and restricted upstream passage of native fisheries. Forest Road 67 ends at the popular Sucker Brook Trailhead just beyond Sucker Brook. The Sucker Brook Trailhead is a primary access to the Breadloaf Wilderness. The project restored the Sucker Brooks natural fish passage and to retain the access to the trailhead by preventing the historical road washouts.

Lake Brook was identified as an important stream and its culvert a significant barrier to fish and aquatic organism passage. FR 30 beyond the culvert was a gated class 1 road that ends in .52 miles at the Big Branch Wilderness. This project removed the culvert, reconditioned the stream bed and adjacent banks. The road has been decommissioned beyond the project area.

6. Snowmobile trail Relocations at Mount Tabor and Liberty Hill

These two trail relocations provide continued access to the VAST snowmobile trail system on the GMNF. The Mount Tabor Project involved construction of a 160 by 160 foot parking area at the Mount Tabor Work Center and relocation of the snowmobile trail that ran through the Administrative site onto an existing road (FR 48A and skid trail). The Liberty Hill trail relocation project replaced an access to the VAST snowmobile trail system that was mostly on private land and has been closed since 2005.

7. Backcountry Privy Replacements

This project replaced 1 batch bin composting privy with an accessible moldering privy and 2 pit toilets with moldering chum.

8. Little Michigan Brook Ski Trail Relocation

1.8 miles of ungroomed cross country ski trail was restored through this project. The trail relocation bypassed the bridge that connected this trail to the system of trails and therefore eliminated the need for the construction of a 40 ft. bridge.



9. 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 2008:

Project	Lead(s)
Contemporary uses of special forest products in and around the Green Mountain and Finger Lakes National Forest	Northern Research Station (NRS), Univ. of VT and a local ethnographer
Parameterization of a Multiplicative Stomatal Conductance Model (DO3SE) to Estimate Seasonal Ozone Uptake in Northeastern Red Spruce Ecosystems	University of Massachusetts
Disturbance History of a Forested Wetland near the Battell Research Forest on the Green Mountain National Forest, Middlebury, VT, USA	Middlebury College
Amphibian and reptile inventory around Crystal and Haystack Ponds	Independent researcher
Amphibian Monitoring in the Lye Brook Wilderness Region of Green Mountain National Forest	Vermont Reptile and Amphibian Atlas Project of Vermont Family Forest
Vermont Odonata	Independent researcher, State of VT
Effects of Forest management on <i>Polemonium vanbruntiae</i> (Appalachian Jacob's Ladder)	Univ. of VT

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

10. Maple Tapping Permits

Five maple tapping Special Use Permits were authorized that allow tapping of area under permit for a period of ten years. Forest Service research personnel from Durham, New Hampshire actively monitor all the sugarbush areas for forest health related concerns such as insects, pests, and diseases. FS staff retains the authority to suspend tapping if monitoring shows stand health has been compromised by insects or disease.

11. Access permits

Five Special use Permits were granted to provide access to private lands by crossing GMNF lands.

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. In 2008, the GMFLNF Monitoring and Evaluation Team developed a process for interdisciplinary Forest Plan field monitoring of projects. The first Forest Plan monitoring field visit was conducted in June 2008. Three projects were monitored: a wildlife opening and early successional habitat creation project and two timber sales. 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 S&Gs and mitigations implemented and effective most of the time. The wildlife opening was maintained using a brontosaurus to clear trees from the area. The team suggested that it would be beneficial to visit more openings cut by the Brontosaurus to monitor the amount of soil impacts, and that it would also be beneficial to monitor the effects of repeated burns on soils on low nutrient site in wildlife openings. During review of the timber sale, concerns were raised over slash left in a stream and some rutting at

project area. These issues were to be addressed before the sale contract was closed. At another timber sale project area, the access road to the landing had eroded and sedimentation had gone into a wetland adjacent to the road. The team discussed measures that could have prevented the erosion. S&Gs and mitigations could have been implemented more consistently at this site. Project follow-up included more field visits and further evaluation resulting in an action plan to address the projects concerns as well as to implement S&Gs and mitigations more consistently in the future. A follow-up field visit was made to the wetland in the Holt Mountain timber sale project which was reported in this section in 2007. The wetland still has hydric soils,

wetland hydrology and hydrophytic vegetation although the vegetation has changed to a more open (sun-loving) plant community.

Recommendations: 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. Continue to evaluate the implementation of SWR G-10 for consistency and effectiveness.

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 2008.

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?

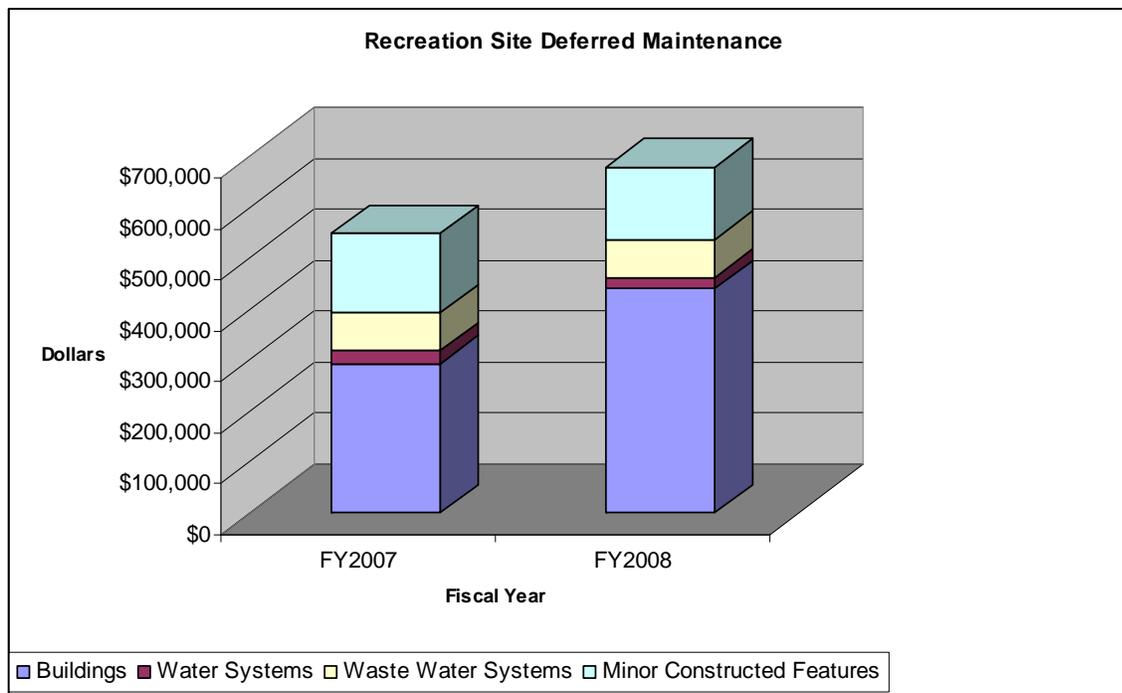
Monitoring Question: To what extent have Forest Plan Objectives been attained?

Monitoring Driver: Forest Plan Goal 12 and Objectives

Background: see FY07 M&E Report.

Monitoring Activities: Deferred maintenance Condition Surveys were completed in FY 2008, using national protocols. On the GMNF, deferred maintenance conditions surveys were completed on eighteen separate recreation sites. 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.

	FY2007	FY2008
Buildings	\$293,909	\$441,304
Water Systems	\$25,085	\$21,680
Waste Water Systems	\$75,788	\$75,788
Minor Constructed Features	\$154,662	\$141,168
Total Deferred Maint.	\$549,444	\$679,940



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 FY 2007 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 FY 2008 deferred maintenance for recreation facilities on the GMNF increased \$130,496 (24%) from FY 2007, and was approximately \$679,940. The majority of the deferred maintenance increase was in the Buildings (+ \$147,395) category of the recreation sites. The Water Systems and Minor Constructed Features categories each decreased by \$3,405 and \$13,494 respectively. 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 FY 2007.

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:

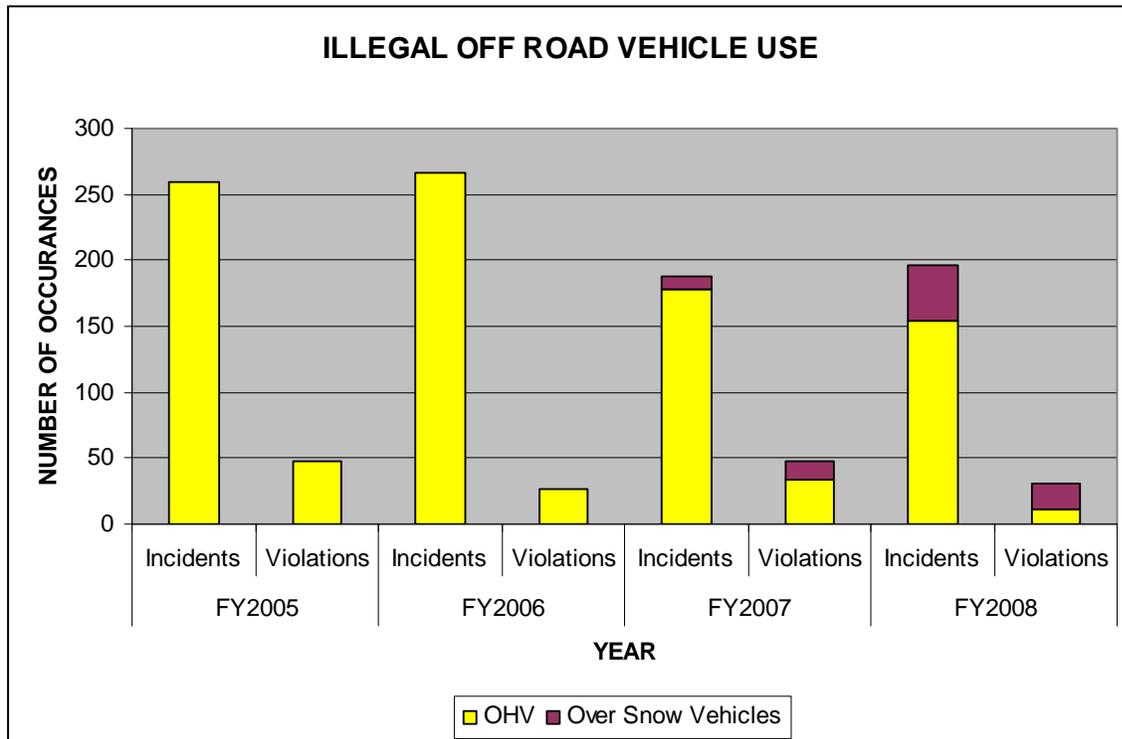
What are the trends in the illegal use of vehicles off roads?

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: There is a long standing concern about the illegal use of motor vehicles on the GMNF. This is well documented in both the 1987 and the 2006 Forest Plans. In addition this is a national issue that prompted a significant change in policy and direction regarding wheeled motorized vehicles. Though a substantial issue, the development of monitoring protocols is difficult due to the scattered nature of violations that often happen in remote areas at nights and during time periods when there are few patrols available. It was decided to utilize existing protocols used by law enforcement personnel as the starting point for monitoring this activity. Additionally, site specific analyses also document unauthorized vehicle use as part of the description of existing conditions.

Monitoring Activities: In FY2008, 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.



Additionally, through site-specific analyses efforts are made to assess the existing condition of unauthorized wheeled motorized uses. The Natural Turnpike Project EA in the communities of Ripton and Lincoln documented the existing condition of unauthorized wheeled motorized uses through general monitoring.

Evaluation and Conclusions: As a starting point, data entered the last three 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 FY2007, data has been entered to show the differences between summer off-highway vehicles and over snow vehicles.

The data shows a decreasing trend from FYs 2005/06 to FYs 2007/08. 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 FY2008 through trail condition inventory monitoring. The trend seems to decrease around the time the 2006 Forest Plan was completed when there was lots of public information and education regarding the management of off-highway vehicles. 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 Natural Turnpike Project EA in the towns of Ripton and Lincoln noted that “[F]ield inspections and conversations with law enforcement indicate that unauthorized motorized use activity in the project area is incidental and not considered a ‘hot spot’ for illegal motorized activity on the GMNF. Evidence of unauthorized ATV use has been noted by field staff in the area around FR 235/FT 259 and the Ripton Town Trail connecting Pearl Lee Road to FR 68. Resource impacts from the unauthorized uses appear light with minimal rutting and vegetation clearing.”

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?

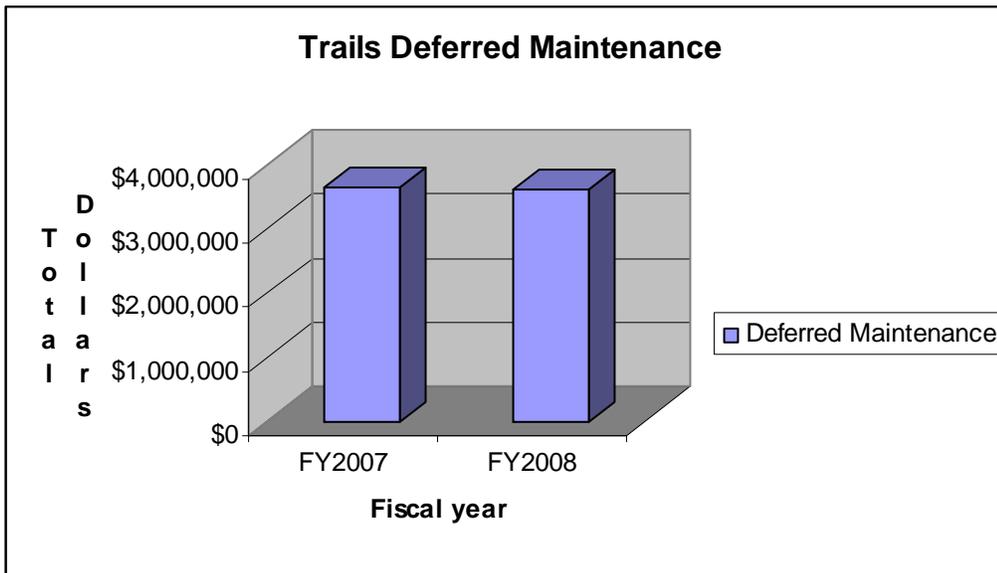
Monitoring Question: Is the quality of the Forest Service trail system and recreation facilities being improved through operation and maintenance?

Monitoring Driver: Forest Plan Goal 12 and Objectives

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 FY 1999 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 three 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 FY 2008, the GMNF staff completed the nationally required conditions surveys on five trails totaling 13.9 miles. In addition, the GMNF staff monitored an additional 100.9 miles of trails for a total of approximately 12% 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 FY 2007, GMNF staff 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 FY 2008, a single position was funded for four months to monitor trails beyond those required nationally. This resulted in an additional 100 miles of trails being monitored beyond the required national sample on the GMNF.

The total deferred maintenance of the trails system reported in FY 2007 was \$3,645,340, and the total deferred maintenance reported for FY 2008 is \$3,612,198. The FY 2007 deferred maintenance figure serves as the baseline on which future years will be evaluated. The total deferred maintenance in FY 2008 was reduced \$33,142 or about 1%.

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 GMNF staff 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: Leave No Trace (LNT) and Wilderness information/education are taught as much as possible to help people understand and take care of the Wilderness. Wilderness Ranger field presence in high use and remote areas continues to be a high priority. LNT contacts, presentations and trainings are recorded for upward reporting. Greatest numbers of people can generally be reached in the field on weekends and holidays during summer and fall.

High priority boundaries (boundaries that abut private lands, power lines, etc.) are often checked for trespass and non-conforming activities on NFS lands within Wilderness. Types of private land encroachment activities on to NFS lands addressed in the past include motor vehicle trespass, unauthorized trail construction and cutting of timber. Known areas with repeated problems are checked on a more frequent basis than those in remote areas, or which abut other NFS lands.

Monitoring Activities: In FY08, the GMNF Wilderness program was in transition which led to reduced staffing compared to FY08. This resulted in reduced capacity to perform education outreach and boundary monitoring activities. One of the primary focuses of our Wilderness education program was teaching internal staff that is transitioning duties into Wilderness management. In addition, the GMNF also completed the following outreach activities to the public.

- 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 one Wilderness Awareness talks at Vermont colleges/ universities and two presentations for new and transitioning recreation and wilderness staff.
- Field and frontline staff made approximately 287 LNT contacts (181 direct contacts, 106 indirect contacts) with the public.
- Two public field trips were conducted as part of the New England Wilderness Act Road Restoration Project.
- One new bulletin board was installed at the Joseph Battell Wilderness portal at the Long Trail on Brandon Gap.
- 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.
- Staff worked closely with two owners of private land inholdings within the Glastenbury Wilderness to discuss Wilderness management principles and access to their land.
- Wilderness management principles were discussed during the Upper White River Project collaboration meetings with the public and local organizations.

The capacity of Wilderness staff to complete boundary monitoring was also reduced in FY08 resulting in less monitoring. Boundary monitoring was focused on areas within the Glastenbury, Breadloaf and Joseph Battell Wilderness Areas.

- Two private inholding boundaries were monitored in Glastenbury Wilderness.
- Portions of the northern boundary along VT125 of the Joseph Battell Wilderness were monitored as part of the 2008 flood damage assessment.
- The boundary of a new inholding (created by the 2006 NEWA) within the Breadloaf Wilderness was monitored.
- Staff continued to implement the 2006 New England Wilderness Act by monitoring travel routes into the Wilderness that were closed to vehicle access in FY08.

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. Initial reports from FY08 show that there may be some encroachment (vegetation clearing) from at least one landowner.

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

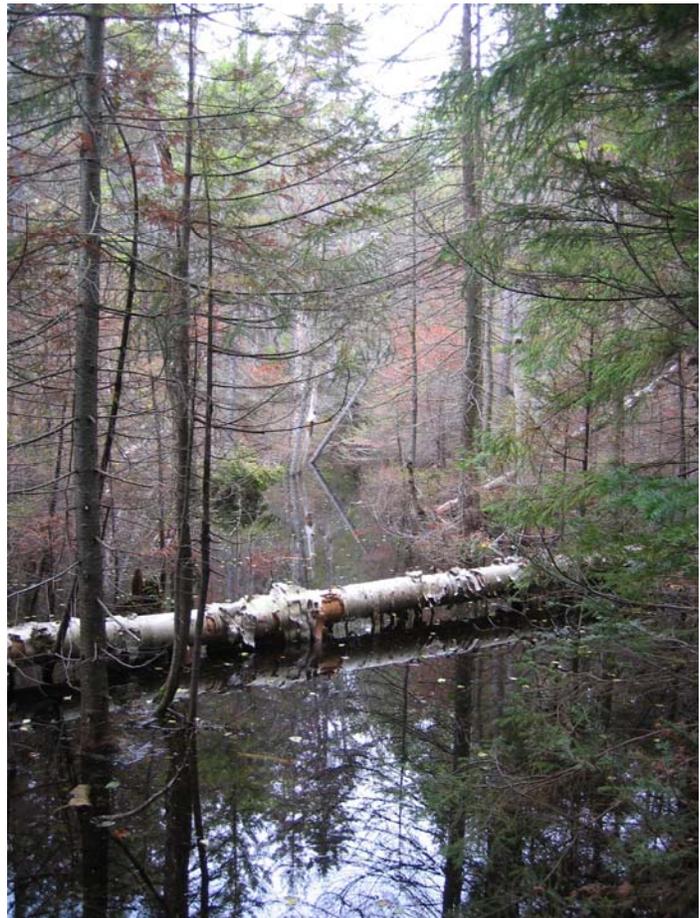
Monitoring Activities: During FY08, Wilderness staff focused on managing Lye Brook, Big Branch and Peru Peak Wilderness Areas to national standards. In addition, there was an effort to establish monitoring in the two new areas, Glastenbury and Joseph Battell Wilderness Areas, designated under the 2006 New England Wilderness Act (NEWA). The three focus areas (Lye Brook, Big Branch and Peru Peak) met the minimum standard for Wilderness management in FY08. 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.

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 FY08 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 FY08. Wilderness staff provided wilderness stewardship presentation 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 FY08 was limited to monitoring existing sites.

Element 7 – Wilderness staff are routinely involved in reviewing applications for recreation special use permits (O/Gs) 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.

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 – Due to FY08 staffing reductions, no points were attained for this element.

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 FY08, 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 and Student Conservation Association.

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 FY09.

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: In total, there are ten private land inholdings within the Breadloaf, Lye Brook and Glastenbury Wilderness Areas and one life tenure special use permit for a camp in the Big Branch Wilderness Area. Five of the inholdings are developed with camps or other improvements, while the remaining six are undeveloped.

Monitoring Activities: Monitoring was completed on the new inholdings as a result of the NEWA. One inholding is located within the Town of Granville in the Breadloaf Wilderness Area, while the other two are located within the Town of Glastenbury within the Glastenbury Wilderness Area. 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 the two inholdings within the Glastenbury Wilderness Area. Wilderness staff worked closely with these two landowners to determine access needs that will be considered for a Special Use Permit authorization in FY08. 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.
- 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, since 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: With certain exceptions, the Wilderness Act of 1964 prohibits motorized equipment, structures, installations, roads, commercial enterprises, aircraft landings, and mechanical transport. Each potential activity to occur within Wilderness is analyzed in a planning framework referred to as the Minimum Requirement Decision Guide (MRDG). The intent of the MRDG is to first determine whether the proposed activity is necessary in Wilderness. If the proposed activity is determined to be necessary, then the MRDG analyzes the minimum action (or tool) necessary to complete the objectives of the proposed activity.

Monitoring Activities: One MRDG was completed in FY08 to analyze the use of motorized equipment just inside the wilderness boundary to re-channel a stream away from a private residence as a result of the 2008 Flood in the Town of Hancock. It was determined that motorized equipment was necessary due to the urgency of the situation in relation to human health and safety, and property investments.

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 FY08. 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 FY08. 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: The use of an excavator within the Joseph Battell Wilderness to re-channel a flood damaged stream away from a residence was successful. The excavator spent most of its time reaching into the wilderness from just outside the boundary. It took less than three hours to complete the work.

Fisheries staff stocked brook trout fry in Bourn Pond and Big Mud Pond during June 2008. 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: The 1964 Wilderness Act, Section 2(c) states “a wilderness has outstanding opportunities for solitude or a primitive and unconfined type of recreation.” The 2006 Forest Plan states “Recreation management will be towards the desired ROS class of Primitive. There will be little evidence of human development in Wilderness MAs with several exceptions including trails, trail shelters, trail blazes, and limited trail signing that provides onsite guidance to visitors. Interaction between users will vary by wilderness, specific places within each wilderness, and season of use. In general, use will be concentrated around trail corridors and other popular features. Away from trails and in low-use wildernesses, evidence of, and interaction with, other users will be low. Facilities and designated campsites may be present when necessary to protect Wilderness values.”

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 from 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 provided 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: The 1964 Wilderness Act, Section 2(a) states “In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition...” The 2006 Forest Plan states, “There will be little evidence of human development in Wilderness MAs with several exceptions including trails, trail shelters, trail blazes and limited trail signing that provides onsite guidance to visitors.” The Vermont Wilderness Act of 1984 allows for the maintenance, including reconstruction, of shelters existing at the time of the enactment of the law.

The Long and Appalachian Trails, including their side trails, pass through the Lye Brook, Glastenbury, Peru Peak, Big Branch, Joseph Battell and Breadloaf Wilderness Areas. Evidence of human occupation or modification within these areas include trail improvements (punchon, waterbars, drain dips, stone steps, corduroy, and bridges) and trail shelters/tent platforms. Each of these shelters has an accompanying privy. The Green Mountain Club (GMC) has a shelter caretaker program and a healthy volunteer corps who provide general maintenance and support to the trail system.

The 2006 New England Wilderness Act designated approximately 42,000 acres of new wilderness in FY07. The newly designated areas included non-conforming structures such as roads and a Forest Service maintained radio repeaters. There are approximately 11 miles of roads with 33 culverts located in the Breadloaf and Joseph Battell Wilderness Areas. The radio repeater is located on Philadelphia Peak within the Joseph Battell Wilderness.

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 FY08.

Staff also completed work on developing a Proposed Action for the removal of road culverts in the newly designated wilderness areas. All culverts were inventoried and analyzed for their feasibility to be removed with non-motorized/mechanized equipment. Of the 33 culverts, ten of them have

been initially determined to be feasible for removal by non-motorized/mechanized methods. This analysis will continue into FY09 with the completion of the NEWA Road Restoration Project EA.

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 FY09 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: The Wild and Scenic Rivers Act established the National Wild and Scenic Rivers System, stating, "It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in a free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations." There were no federally designated wild, scenic, or recreation rivers within the State of Vermont in FY08. Rivers and streams on the GMNF were inventoried and evaluated to determine their eligibility as Wild, Scenic or Recreation Rivers. The 2006 Forest Plan identified seventeen eligible Recreation River segments, eight eligible Scenic segments, and three eligible Wild segments on the GMNF. The Forest Service may only recommend a river as eligible and suitable for national status. Designation of a river occurs only through an act of Congress.

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 FY08 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: See FY07 M&E Report.

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 FY08 our monitoring emphasized review of the overall appearance of the GMNF and examined visual



resource concerns for project planning and implementation. Forest monitoring focused on the Upper White River IRP (Integrated Resource Project) in the northern part of the GMNF looking at past harvest treatments and the current visual effects for future timber harvest and maintenance proposals. 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.

Evaluation and Conclusions: The overall appearance of the Forest met the VQO's. 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. Monitoring in the Upper White River IRP show that scenic viewing opportunities are being lost because past timber treatments in some stands created temporary vistas that are now growing up to block views.

Recommendations: Proposals for maintaining existing vistas and creating new opportunities for scenic viewing will be made in the Upper White River IRP in FY 2009. In FY 09, monitor areas where timber is harvested from FY 2006 to 2008 timber contracts for effects to visual quality. Also in FY 2009, finalize planning and design of improvements to flood damaged areas.



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 (“INFRA”), and contact with Tribes with vested interests on both Forests continued.

Recommendations: Continue with these activities and, as possible, address site evaluation, curation and historic building needs. We should increase the frequency with which we invite and accompany Tribal representatives 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 40 previously known archaeological sites across the Forest. In addition, inventory was conducted on approximately 7,500 acres of GMNF lands leading to the documentation of an additional 50 sites.

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 Patterson Brook Salvage Sale on the Rochester District, and a component of the Greendale Timber Sale on the Manchester District. Both contained sites to be avoided or buffered during timber-related work, and Forest archaeologists re-located and evaluated 2 sites on the Patterson Brook project and 1 site on the Greendale project.

Evaluation and Conclusions: All three sites (the remains of two farmsteads that were to be avoided, and a dry-laid stone bridge/stream crossing that was to be used but buffered with logs and snow) were located and compared to their condition prior to the project activity. Their

condition, as desired, was unchanged – a product of good Sale Administration by Forest Service personnel.

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?

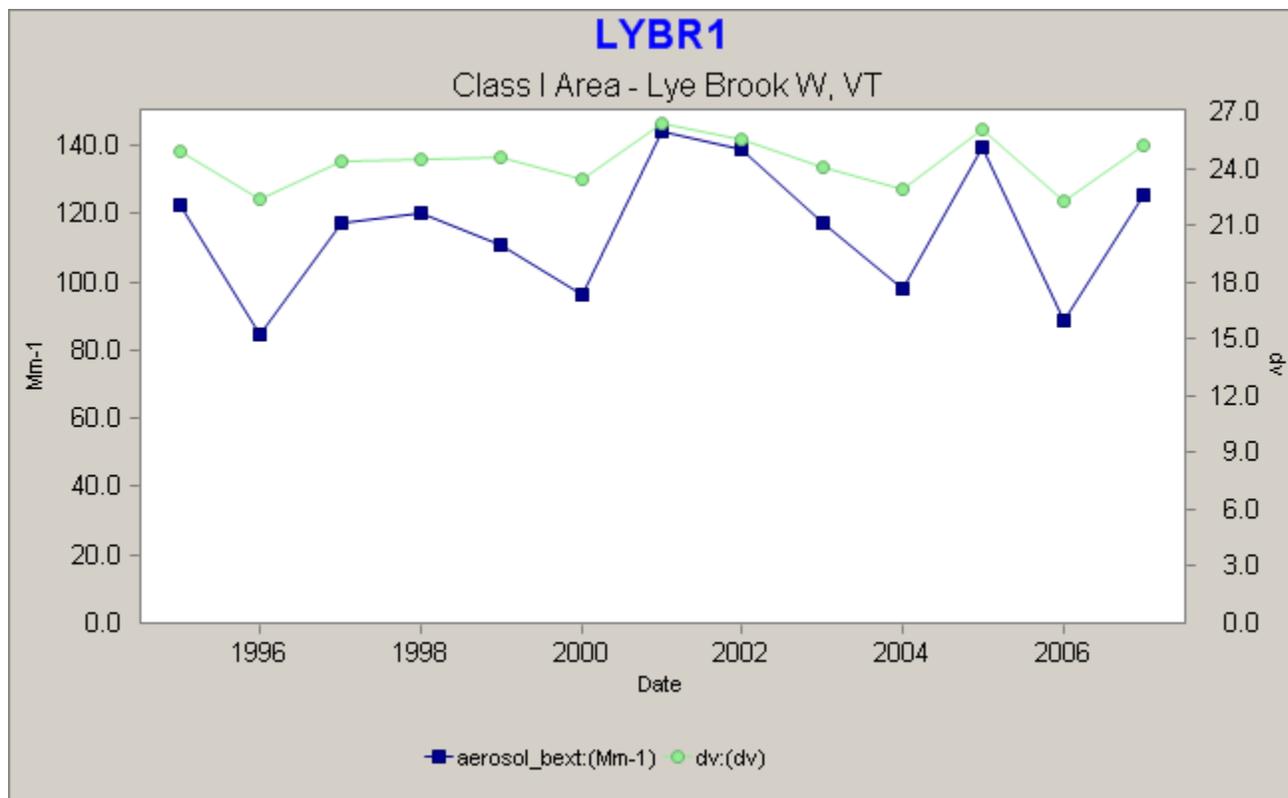
Monitoring Driver: Forest Plan Goals 2-8, 12 and 13

Background: See FY07 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.

To measure for the visibility AQRV, the GMNF staff maintains an IMPROVE (Interagency Monitoring of Protected Visual Environments) site near the Lye Brook Wilderness Area. The IMPROVE site consists of an aerosol visibility monitor. On a national scale, managing for visibility impairment in Class I areas is being done, in part, due to the 1990 amendments to the Clean Air Act. The 1990 amendments noted numerous sources of air pollution were contributing to regional haze, which affects Class I areas. Regional haze is defined as visibility impairment caused by the cumulative air pollution emissions from numerous sources over a wide geographic area. Some of the common fine particulates that can impair visibility include sulfates, nitrates, organic material, elemental carbon (soot), and soil. The initial Regional Haze Rule was proposed by EPA in 1997 and was finalized in 1999. Under this rule, all states are required to submit implementation plans for improvement of visibility in Class 1 areas to EPA. The Forest Service has been active in reviewing these state implementation plans across the United States. The GMNF has focused on reviewing the state implementation plans that have the greatest likelihood of affecting the air quality in the GMNF Class I area.

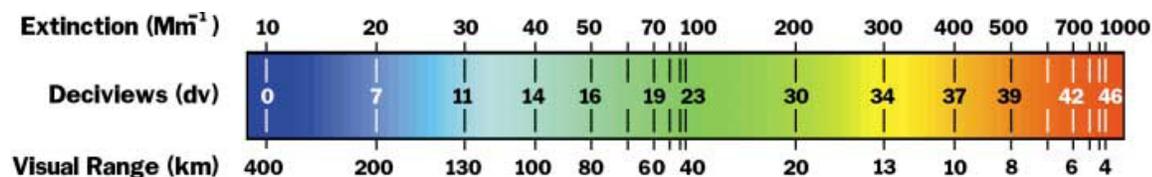
Evaluation and Conclusions: Thirteen years of data from the GMNF IMPROVE site are graphed in Figure 1. The 20% worst visibility days per year (a metric established by the Regional Haze Rule) are shown in this graph. Over this period, it can be seen that there is some variability in the 20% worst visibility days by using two scales. Graphed in blue is a measure called Beta-extinction (Bext) and the units of measure are in inverse megameters (Mm⁻¹) on the left vertical axis. This measure is based upon mathematical techniques which are used with the IMPROVE data to provide estimates of how much sunlight is scattered and absorbed as it passes through the atmosphere. A higher value for Bext means the visibility conditions are poorer than a lower value. Typically, a large Bext value means “manmade” emissions of air pollution are impacting the visibility at the Class 1 area. Deciviews, on the right vertical axis, and in green on the graph, is a metric that also measures visibility extinction. On a particle-free, pristine day, the deciview index has a value of zero. For each 10% increase in light extinction, the deciview index goes up by one. Therefore, higher deciview values equate to reduced visibility. Under many scenic conditions, a



Aerosol Beta-extinction values in blue (Mm-1), and deciview values in green. (<http://vista.cira.colostate.edu/dev/web/AnnualSummaryDev/Trends.aspx>)

change of one deciview is considered to be just perceptible by the average person. Figure 2 compares three mathematical metrics used to measure visibility.

The data in Figure 1, along with the corresponding comparisons in Figure 2, illustrate that the 20% worst visibility days per year at the Lye Brook IMPROVE site has ranged from approximately 45 km in 1996 and 2006 to approximately 30 km in 2001. The trend for this thirteen year period for the 20% worst visibility days per year illustrates no long term increase or decrease in visibility.



Comparison of three mathematical metrics: extinction values, deciviews, and visual range in kilometers. (Introduction to Visibility, William Malm, May, 1999, http://vista.cira.colostate.edu/improve/Education/intro_to_visibility.pdf)

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: See FY07 M&E Report.

Monitoring Activities:

1) Soil, Water and Riparian Resource Monitoring in Harvest Areas, 2005-2008

Soil and water specialists conducted implementation and effectiveness monitoring in harvest areas from 2005-2008. Monitoring looked at whether measures designed to control erosion and stream sedimentation, maintain soil and water quality, were implemented and effective. Measures monitored were:



- State of Vermont Acceptable Management Practices (AMPs)
- GMNF S&Gs
- Mitigation measures (also known as design criteria) from GMNF project environmental assessments

The monitoring protocols were designed to provide a general *indication* of the level of implementation and effectiveness of AMPs, S&Gs, and mitigation measures.

2) Monitoring of Implementation of Soil, Water Riparian Guideline G-10

Considerable time was allocated in 2008 to monitoring the implementation of Soil, Water Riparian Guideline G-10. This Guideline states:

“Within 100 feet of wetlands and seasonal pools, activities should be limited to those that protect, manage, and improve the condition of these resources. Acceptable activities should be approved on a case-by-case basis.”

G-10 provides some flexibility in what management activities can be done within 100 feet of wetlands and seasonal pools, provided these resources are protected and/or improved. Monitoring focused on clarifying the acceptable management actions, within the 100-foot distance.

3) Soil Quality Monitoring

Soil quality standards are currently being revised for National Forests in the northeastern U.S., a major factor in FS staff's decision not to monitor compliance with standards in 2008. Revisions are expected to be done by 2010, at which time FS staff will initiate compliance monitoring.

FS staff conducted other valuable types of soil quality monitoring in 2008. The Soil, Water and Riparian Resource Monitoring in Harvest Areas (see item 1, above) was the primary type of soil quality monitoring completed in 2008. In addition, a new long-term soil quality monitoring project began in 2008 called the Long-term Ecosystem Monitoring Project. The purpose of this project is to track change in soils and forest vegetation over a 50+ year timeframe. This monitoring will provide insight into if/how soils are changing in response to factors such as atmospheric deposition, climate change, and non-native invasive species. Soil samples were collected at five sites in 2008. These samples will undergo soil chemical analysis in 2009 analysis, after which we will report the results.

Evaluation and Conclusions:

1) Soil, Water and Riparian Resource Monitoring in Harvest Areas, 2005-2008

FS data indicated that most AMPs, S&Gs, and mitigation measures were implemented most of the time. More specifically:

- 63% of AMPs, 71% of Forest Plan Standards, 72% of Forest Plan Guidelines, and 77% of mitigation measures were implemented at a high rate (in general, implemented more than 90% of the time).
- Only one AMP and two Guidelines were consistently not implemented. All three of these measures address the need for seeding and mulching at stream crossings.

When AMPs, S&Gs, and mitigation measures were implemented, they were effective in protecting the soil and water resources. No instances of stream sedimentation were observed, beyond the small amount of sedimentation that is inherent in any stream crossing. Stream water quality and aquatic habitats were protected in our harvest areas.

If you would like a copy of this monitoring report titled, "Soil, Water and Riparian Resource Monitoring in Harvest Areas – Monitoring Results from 2005-2008", contact the Soil Scientist at (802) 747-6742.

2) Monitoring of Implementation of Soil, Water Riparian Guideline G-10

Based on our interdisciplinary, observational monitoring on trail projects and harvest areas in 2008, we identified specific management actions that can take place within 100 feet of wetlands and seasonal pools. Examples of acceptable actions are:

- Harvesting diseased trees. In some cases, if trees adjacent to wetlands are left, they could continue to harbor disease.
- Cutting competing vegetation around apple trees to provide more sun and nutrients for the apple trees. Apples are an important wildlife food.
- Harvesting trees to provide early successional species wildlife habitat. Aspen, which often occurs adjacent to wetlands, is a good example of this. Young aspen provides benefits to many wildlife species.
- A recreational trail crossing a small wetland.

These actions will only be implemented if they are deemed appropriate, based on site evaluation.

FS staff monitoring also indicated that many wetlands on the Forest are small, ranging in size down to a few square yards. The most common examples of this are small seeps, and wetland "pockets". FS staff finds that it is often not practical to apply G-10 to these small wetlands and

seeps. In future environmental assessments, FS staff plans to identify the minimum size wetland to which G-10 will apply, then describe the environmental effects.

Recommendations: Monitor the implementation and effectiveness of AMPs, S&Gs (including G-10), and mitigation measures in a variety of project areas. In 2009, change monitoring methods to coincide with soon-to-be finalized national direction for monitoring of Best Management Practices.

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 FY07 M&E Report.

Monitoring Activities: Water quality is a critical component of aquatic, riparian, fisheries, and wetland resources; and macroinvertebrate populations are an important indicator of water quality.

In 2008, the only water quality monitoring that was accomplished was the macroinvertebrate monitoring in seven streams on the GMNF through a contract with the State of VT DEC during the summer and fall.

Evaluation and Conclusions: The VT DEC Macroinvertebrate monitoring results showed the majority of streams rating very good or excellent, and one stream, Flood Brook, rating poor (probable cause being related to localized effects from the on-stream Hapgood Pond, resulting in high water temperatures, low dissolved oxygen, sediment build-up, and elevated nutrient levels.

Recommendations: Continue water quality macroinvertebrate monitoring through contracts with the VT DEC and re-start the water quality monitoring on sites throughout the GMNF to track past, present, and future timber sales. Riparian, vernal pool, and wetland habitats on the GMNF are being identified by surveys and inventories being conducted during the planning stages of interdisciplinary projects, in order to protect, manage, and improve the condition of those resources. Monitor riparian, vernal pool, and wetland habitats before and after management activities to determine management effects.

Continue water quality and flow monitoring on the GMNF will continue in the future as long as funding is available.

Fish

Evaluation Question:

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

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 2008 indicates that juvenile Atlantic salmon populations in GMNF streams are similar to population densities of the last 3 years and higher than the low levels observed during 2000-2004. Atlantic salmon populations, like other fish and wildlife species, can change substantially from year to year. The 2008 population of 908 salmon per mile is slightly lower than the 2007 estimate of 1024 per mile. 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.

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

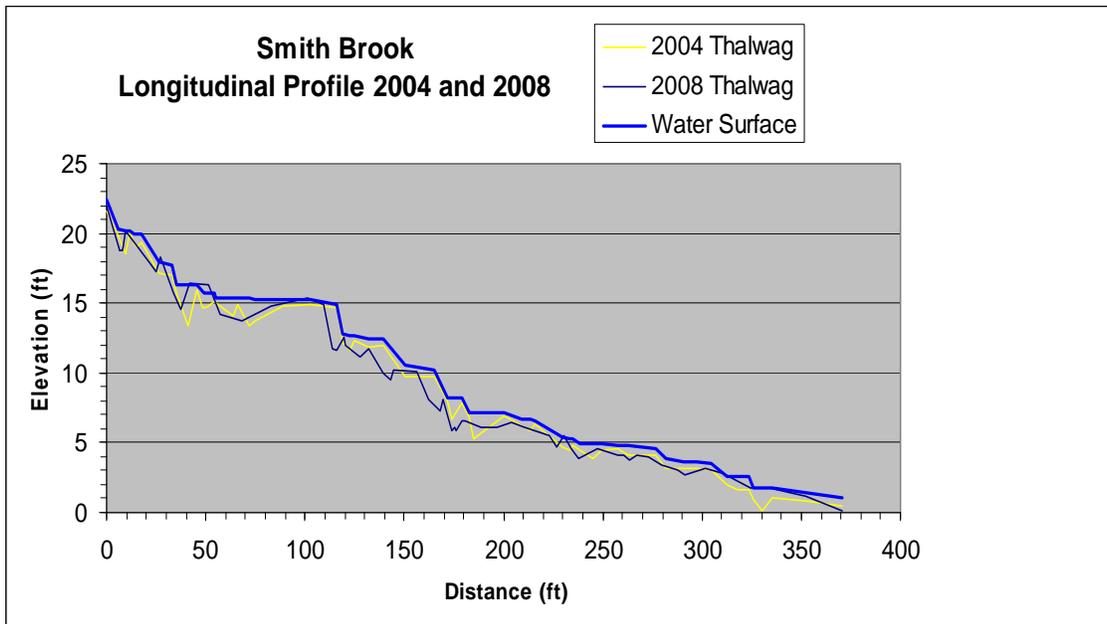
Background: see FY07 M&E Report.

Monitoring Activities: In 2008, fish habitat and channel monitoring occurred in six sites on five streams. These streams included: Austin, Leicester Hollow, Smith, Jones and Yaw Pond Brooks.

Evaluation and Conclusions: A Preliminary review and comparison of the 2004 and 2008 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 graph below depicts the longitudinal profiles (channel slope, bottom contour, & stream bank) of the Smith Brook monitoring site in 2004 and 2008. The stream continues to be characterized by a series of steps and pools with a steep channel slope and low sinuosity. Another indicator of habitat quality and stability is the amount of pool habitat, which has remained constant over the four year period as depicted by the thalweg graphics. In the graph, a pool is indicated by a drop and subsequent rise in elevation along the thalweg lines. An example of channel stability is evident within the first 50

feet of the channel, where pools have not changed over the four year monitoring period. Under these conditions, aquatic habitat for aquatic insects and fish also remains in good condition. A more detailed analysis of these and other years data will be conducted in a future annual monitoring report.

Recommendations: Conduct regularly scheduled level III monitoring in FY 09.



Longitudinal Profile of Smith Brook monitoring site in 2004 and 2008

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

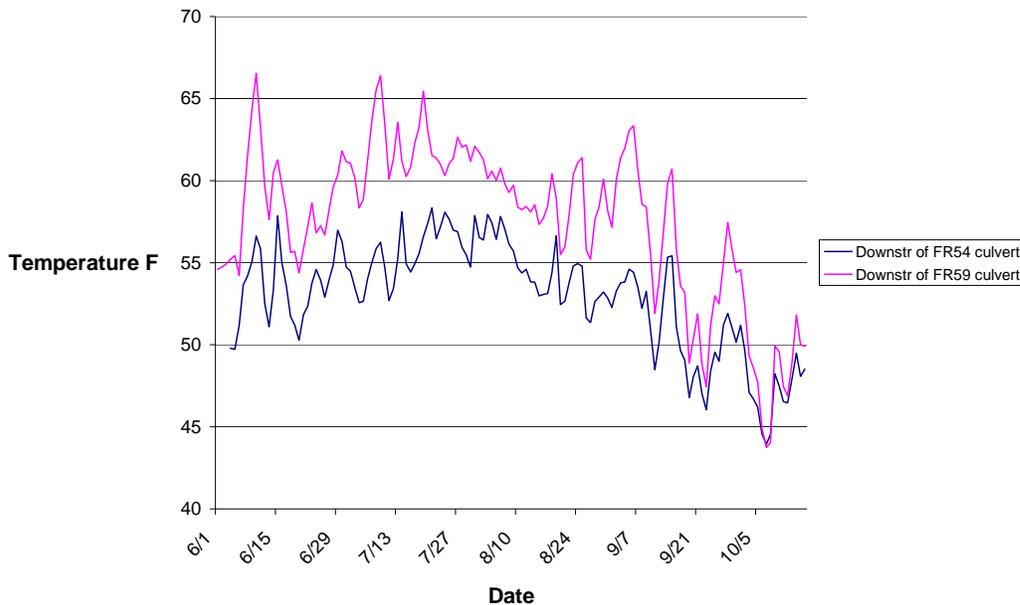
Background: see FY07 M&E Report.

Monitoring activities: Stream temperature monitoring was conducted at 9 sites in five streams on the GMNF in 2008, which are listed in the table below.

Stream Name	Temperature Monitoring Location	Monitoring Dates	
		Start	End
Fire Brook ¹	Above the confluence with the North Branch Middlebury River	June 4	June 13
		July 30	Oct 9
Sparks Brook	Downstream of the culvert crossing on FR54	June 4	Oct 16
Sparks Brook	Downstream of the culvert crossing on FR59	June 1	Oct 9
Alder Brook	Above the confluence with the North Branch Middlebury River.	June 1	Oct 9
Middle Branch Middlebury River	Downstream of the culvert crossing on FR59.	June 4	Oct 16
Middle Branch Middlebury River	Downstream of the bridge on Wagon Wheel Road.	June 1	Oct 16
North Branch Middlebury River	Upstream of the confluence with Alder Brook.	June 1	Oct 9
North Branch Middlebury River	Downstream of the bridge on FR235	June 1	Oct 9
North Branch Middlebury River ¹	Downstream of the crossing on Dugway Road	June 1	June 13
		July 30	Oct 9

1. Temperature loggers were out of water from June 14 to July 29 following flooding.

Sparks Brook Average Temperatures in 2 sites 6/1 - 10/16/2008



Evaluation and Conclusions: An evaluation of the data collected in 2008 indicates that water temperatures in the streams monitored are within the desirable range to support healthy native fisheries and aquatic insect communities. The sites on Alder Brook and the North Branch above Alder Brook did experience several days in June when stream temperatures 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 three streams that were monitored in 2008 exhibited excellent temperature profiles ranging from the mid-50 to low 60's degrees F (Fahrenheit). Streams with average daily temperatures below 70 degrees Fahrenheit are not considered to be stressful for native aquatic species. The graph illustrates the average temperature range of the two sites monitored in Sparks Brook during 2008.

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: Fish and aquatic organism passage is critical to the survival and perpetuation of native fish and invertebrate populations. Impacts from barriers to aquatic passage can range from complete exclusion of species from rivers and their tributaries to highly fragmented habitats often associated with highly developed transportation systems adjacent to stream networks. GMNF staff initiated culvert inventory and monitoring activities at stream/road crossings in 1995. To date, approximately 175 culverts have been surveyed, evaluated and/or monitored on the Forest. Evaluation criteria and coarse filter screening process were developed using biological and hydrologic information from scientific literature. In recent years, the GMNF staff has incorporated fluvial geomorphology and engineering criteria to enhance the evaluation process. Under the 2006 Forest Plan, the overall objective of road crossing/stream culvert inventory and monitoring is to improve maintenance of crossing structures and improve the design and installation of new or replacement structures to provide aquatic organism passage, aquatic habitat connectivity, and fluvial geomorphic processes and functions (i.e. structures pass water, trees/wood material, and allow free movement in streams as in natural channels) in GMNF waters.

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

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



20'x 13' culvert barrier on Lake Brook



Removed culvert with restored channel

Monitoring Activities: In 2008, one fish and aquatic organism passage improvement project was monitored and evaluated. The project involved removing a major culvert barrier in Lake Brook nnnn x(Manchester Ranger District) using construction equipment, and restoring its channel and banks to natural conditions.

Evaluation and Conclusions: An evaluation of the project indicates that many benefits were achieved:

- Unobstructed passage for fish to quality spawning and rearing habitat
- Improved habitat for other aquatic species such as native salamanders and insects.
- Approximately 4 miles of restored habitat upstream of the project
- Stabilized stream banks and reduced soil erosion
- Reduced sediment in aquatic habitat downstream of the project.

Project monitoring also revealed that the desired stream channel dimension (X-sectional area, bankfull width and step:pool habitat conditions) were achieved. The photographs show the before and after conditions at the project site.

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 GMNF monitored fish habitat and channel conditions in six streams during the summer of 2008 (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: Will be reported in the 5 year Comprehensive Evaluation Report.

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

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: see FY07 M&E Report.

Monitoring Activities: In 2008 the Green Mountain National Forest cooperated with the Vermont Fish and Wildlife Department (VFWD) and suspended our monitoring of bats on the Forest until more information regarding the White Nose Syndrome (WNS) became available. 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. VFWD began monitoring the Greeley Talc Mine, using sensors on individual bats to record body temperature to

assess winter activity levels. The results of this monitoring effort will not be available until late 2009. All aspects of our monitoring program are coordinated with 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: see FY07 M&E Report.

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 2008 there were four 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 USFWS and VFWD monitor Bald Eagle nesting closely as do several local groups such as Vermont institute of Natural Science (VINS) 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: see FY07 M&E Report.

Monitoring Activities: Annual monitoring of high elevation peaks occur by volunteers across the GMNF by volunteers working in conjunction with the Mountain Birdwatch monitoring program organized by VCE. On the GMNF, FS 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: The Vermont Nongame and Natural Heritage Program (VNNHP) does not keep records of its odonate species (dragonflies, damselflies). A VINS group of citizen scientists are currently creating an atlas Vermont's lepidopteron (butterflies and moths). In an analysis completed on 2002, several experts and more pieces of information were questioned and reviewed for information leading to the existence of the RFSS odonates and lepidopteron on the GMNF. These species include West Virginia white, gray petaltail, harpoon clubtail, southern pigmy clubtail, and the forcipate emerald.

The West Virginia white has been recently documented on the GMNF, primarily in rich northern hardwoods on the southern portion of the forest. The gray petaltail remains elusive yet is believed to occur on the GMNF. The harpoon clubtail is known from the Deerfield River, the southern pigmy clubtail is known in Bourn Brook and forcipate emerald has been found at Grout Pond and at a wetland area near Lost Pond shelter, all of which are located in the Manchester District of the GMNF.

Monitoring Activities: Monitoring activities occurring in 2008 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: see FY07 M&E Report.

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, FS 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, FS staff conducting annual stream inventories continue to report sightings of the species mentioned above.



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

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: see FY07 M&E Report.

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 2008, 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 2008, FS staff identified 3 territorial pairs with two of the pairs successfully reproducing and fledging young. Also in 2008, 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 FY 2008, approximately 200 acres of deer wintering habitat was surveyed in Compartments 45 and 74. These areas included additional Texas Falls and Facet Hill deer yard areas.

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. GMNF biologists and technicians began conducting general site surveys in 2007 to identify forest birds in

areas where management activities are proposed. 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: 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: In 1983, the common loon population hit rock bottom with seven nesting pairs in the State of Vermont. In 2006, the total number of nesting loons reached a high of 58 pairs. Due to the size of the GMNF lakes and ponds, only a small portion of successful nesting loons occur on waterbodies on GMNF.

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 FY 2008, FS staff and volunteers collected data on gray squirrels, 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 resulting from FS management practices. Each of the monitoring activities was completed using FS 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 collecting data, and assessing every opportunity to increase effectiveness and methods of data gathering and public participation.

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 2008, FS staff and volunteers conducted surveys for the gray squirrel, ruffed grouse and American woodcock on established routes, wherever and whenever possible. The data was added to the existing database of information for future analysis.

FS biologists continue to provide guidance to the other FS staff regarding opportunities to increase vegetative, age class, and structural diversity whenever there is a proposed action on the GMNF. 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 because they are easy to follow, and provide information that can be duplicated each year. The monitoring protocols, however, are limited in the amount of data they can provide. The data must be used 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. 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/fruitletting, 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. 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.

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 seven vascular plants and one non-vascular plant 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 FY08 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
- Monitoring of several populations of four different plant species was accomplished by local volunteer, Warren King
- Two sedges on the RFSS list were monitored as a result of coordination with NEPCoP
- Seven plants on the RFSS list occurring on Mt. Horrid were monitored by a botanical contractor
- In total, 40 plant species (69 populations) were monitored by Forest staff, (including an intern through the Student Conservation Association and a student in the Student Temporary Employment Program), contractors, and volunteers; plants monitored included:
 - 23 species of wildflowers (45 populations)
 - 6 species of grasses sedges and rushes (7 populations)
 - 7 species of ferns and fern allies (11 populations)
 - 4 species vines, shrubs, and trees (6 populations)
- New occurrences were found of the following RFSS:
 - *Asclepias exaltata* (poke milkweed)
 - *Cryptogramma stelleri* (Steller's cliffbrake)
 - *Desmodium paniculatum* (paniculate tick-trefoil)
 - *Polemonium vanbruntiae* (Appalachian Jacob's ladder)
 - *Prenanthes trifoliata* (three-leaved rattlesnake-root)
 - *Sisyrinchium atlanticum* (eastern blue-eyed grass)
- Many sites of proposed ground-disturbing projects were surveyed by Forest staff

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

Evaluation and Conclusions: Last year we reported discrepancies between different sources of data for many plant populations, and imprecise location data for many others, making relocation and monitoring difficult, at best. To address this problem a major data reconciliation project was undertaken in FY08, which in turn resulted in one of the most successful monitoring seasons to date. Species to be located were, however, mostly those with good location data resulting from the data reconciliation effort. Monitoring in future years will focus on species with more nebulous site information, and the result may be less success in locating populations to monitor them. Results of this year's monitoring are summarized above, with details in Table 1.

- In FY07 FS staff reported that a population of *Conopholis americana* (squaw-root) that had not been found for several years was relocated. In FY08, the other known location for this species, also not visited in many years, was located and was so large that only an estimate of population size could be made. Our conclusion is that this species is stable or increasing on the GMNF.



- 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. Our tentative conclusion is that this species may no longer exist on the GMNF, although a third visit should be made. No active management is occurring at this site.
- FS staff searched for and found one of two previously documented occurrences of *Desmodium paniculatum* (paniculate tick-trefoil) that were not found in FY07, and a new population was found nearby. There are now three known occurrences; all are very tiny, and on the western edge of the Forest. This is in keeping with the conclusion during Species Viability Evaluations that “in Vermont, this is more of a western species, and it is marginal on GMNF (SVE Panel 2002)”.
- A site where *Diplazium pycnocarpon* (glade fern), *Eupatorium purpureum* (sweet joe-pye weed), *Lespedeza hirta* (hairy bush-clover) and *Panax quinquefolius* (ginseng) were previously recorded was searched in FY07, and none was found. It was hypothesized that imprecise location information was the reason for negative results. Data reconciliation that occurred in FY08 resulted in a clearer understanding of location for each of these species, and all four were found in FY08, including a new sub-population of the *Eupatorium* that was quite robust, suggesting that this species is doing well on the GMNF.
- In FY06, FS staff reported the need to continue searching for *Panax quinquefolius* (ginseng) to determine whether populations have disappeared, or searches have simply not occurred in the right location. While this still needs to occur, an additional four populations were located and monitored in FY08.
- In total, 69 populations of 40 different species were monitored. Three populations of three species were monitored and appeared to be declining; 16 populations of 11 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 is still a need to develop a plan for controlling NNIS (non-native invasive species) at three sites of *Panax quinquefolius* (ginseng) found in FY06. This planning will be accomplished in conjunction with development of the Green Mountain Invasive Plant Control project, which is now in its beginning stages, with a decision expected early in FY10.

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. While the qualitative assessment indicates the plants are thriving, there is a need to devote time and funding to complete this task.

Last year we reported that additional *Polemonium* populations should be monitored, and the proposed administrative study should be implemented and monitored. In FY08, the study was begun. An initial set of monitoring data was gathered, a predictive model for best places to look for new populations is in development, and the affects of forest management on these plants has begun to be studied. Our recommendation for FY09 is to continue to fund this valuable study.

Since the only known *Collinsonia canadensis* (Canada horsebalm) site on GMNF has been visited with negative results two years in a row, a third and final visit should be made, and if the plant is not found, its inclusion on the RFSS list should be evaluated during the next region-wide RFSS update.

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.

In FY07 we described the extensive data that had been gathered on *Juglans cinerea* (butternut). In FY08, dialog began on potential locations for a future clone bank for butternut, but no decision was reached. This dialog should continue until a decision is reached, and site development should be initiated.

Monitoring in FY08 focused on those RFSS for which location information was best documented. In FY09 and in future years, monitoring should focus on those populations that will be harder to find, but with the understanding that it will take more time and money per population than in FY08. In addition, in FY 09 Fs staff should search for any population not found in FY08, but likely to still exist in order to determine whether the population has truly disappeared, or were the directions for finding it poor.

For plants monitored in FY08, as well as for those monitored in the future, ongoing data reconciliation will need to occur, including reconciling electronic versus hard-copy data. One way that this needs to occur is for FS staff to enter all new monitoring data (from FY08 forward) into NRIS, and then to compare that to exist electronic data.

In FY06 we reported a desire to develop a more standardized approach to monitoring RFSS, and in FY07, as we began using the forms associated with the new NRIS database, we realized a more streamlined version of the data sheet was needed. In FY08, we developed a way of using the state form in a slightly modified way to accommodate both NRIS and VNNHP, and had greater success in collecting field data than in the past. The next recommended step is to formalize the process by rewriting the field form.

Table 1: Plants on the GMNF RFSS list that were monitored in FY08, including new occurrences found

Scientific Name <i>Common Name</i>	# populations monitored	Results	Action needed
Asclepias exaltata <i>Poke milkweed</i>	2	1 new population found; 1 other relocated & vigorous	None
Aureolaria pedicularia Fernleaf yellow false-foxglove	1	1 plant found	None
Blephilia hirsute Hairy woodmint	2	1 w/ 3 sub-populations relocated; feeble but some flowering; 1 population not found	Check to see if 1st population survived August floods; obtain better location information for the 2 nd
Cardamine parviflora (= <i>C. parviflora</i> var. <i>arenicola</i>) Small-flower bitter-cress	2	Both populations found & in flower or fruit	None
Carex aestivalis Summer sedge	2	1 found, not vigorous, but no decline; 1 not found	Search again for population not found
Carex bigelowii Bigelow sedge	1	Vigorous	Analyze photo plot data to quantify multi-year trend
Carex haydenii Cloud sedge	1	Not found despite search in correct area	Revisit to determine if plants rebound
Carex schweinitzii Schweinitz's sedge	1	Population found, but timing not right for assessing reproduction	Revisit earlier in season next time (in about 5 years)
Carex scirpoidea Bulrush sedge	1	Population stable & reproducing	None
Clematis occidentalis var. occidentalis (=verticillaris) Purple clematis	3	2 not relocated; 1 located but feeble	Obtain better location information for the 2 not found
Collinsonia canadensis Canada horsebalm	1	Not located 2 years in a row despite apparently the right location	Check 1 more time in next 5 years to confirm loss
Conopholis americana Squaw-root	2	Both populations located; reproductive & vigorous	None
Cryptogramma stelleri Steller's cliffbrake	2	1 new population found; 1 old relocated & healthy	Gather data on new population w/in next 5-10 years
<i>Cypripedium parviflorum</i> var.	4	1 found; others not located	Revisit those not found to determine whether

Table 1: Plants on the GMNF RFSS list that were monitored in FY08, including new occurrences found

Scientific Name <i>Common Name</i>	# populations monitored	Results	Action needed
pubescens Large yellow lady's-slipper			truly missing
Cypripedium reginae Showy lady's-slipper	2	1 population found & healthy; 1 not found	Obtain better location information for the 2nd
Desmodium paniculatum Paniculate tick-trefoil	2	1 known population found; 1 new located; both small but flowering	None
Diplazium pycnocarpon Glade fern	1	Population found & healthy	None
Dryopteris filix-mas Male fern	2	Neither found	Revisit to determine whether populations missing
Equisetum pretense Meadow horsetail	1	Population found & healthy	Revisit to see if survived August floods
Eupatorium purpureum Sweet joe-pye weed	1	Known plants found; large new sub-population discovered	None
Geum laciniatum Rough avens	1	Population healthy but flattened by overflowing stream	None
Hackelia deflexa var. americana Northern stickseed	1	Population presumed found; timing not right for confirming identification	Revisit earlier in season to confirm identification
Helianthus strumosus Pale-leaved sunflower	1	Population found & reproducing	None
Isotria verticillata Large whorled pogonia	1	Population found, with some reproducing	None
Juglans cinerea Butternut	1	Tree identification incorrect	None
Juncus trifidus Highland rush	1	Population size decreased, though some may not have been reached due to rough terrain	None
<i>Lespedeza hirta</i> Hairy bush-clover	1	Population found; small but some reproduction	None
<i>Panax quinquefolius</i> Ginseng	4	All 4 found; all small & not very vigorous	None
<i>Phegopteris hexagonoptera</i>	3	2 found & vigorous; 1 not found	Revisit 1 not found to determine whether

Table 1: Plants on the GMNF RFSS list that were monitored in FY08, including new occurrences found

Scientific Name <i>Common Name</i>	# populations monitored	Results	Action needed
(= <i>Thelypteris hexagonoptera</i>) Broad beech fern			population missing or directions are poor
<i>Pinus rigida</i> Pitch pine	1	Population found & vigorous	None
<i>Platanthera orbiculata</i> Round-leaved orchis	2	Neither population found; 1 search may not have been in correct location	Revisit site where location was questionable
Polemonium vanbruntiae Appalachian Jacob's ladder	8	7 populations monitored, including many sub-populations; 1 new population found, with 3 sub-populations; populations generally doing well	None
Prenanthes trifoliolata (= <i>Nabalus trifoliata</i>) Three-leaved rattlesnake-root	2	1 known population found; 1 new located; both small but flowering	None
<i>Rhodiola</i> (= <i>Sedum</i>) <i>rosea</i> Roseroot stonecrop	1	Population size stable; plants vigorous; many flowering	None
<i>Saxifraga paniculata</i> (= <i>aizoon</i>) <i>ssp.</i> <i>Neogaea</i> White mountain saxifrage	1	Plants healthy; no evidence of flowering	None
Selaginella rupestris Rock spikemoss	1	Population not found	Obtain better location information
Sisyrinchium atlanticum Eastern blue-eyed grass	2	1 known population not found; 1 new population found	Revisit to determine if truly missing
Solidago squarrosa Stout goldenrod	1	Population size stable or increased; plants flowering	None
Vaccinium uliginosum Alpine bilberry	1	Population size stable or increased	None
Woodsia glabella Smooth woodsia	1	Population size increased	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: In May through September of 2008, the following monitoring and related activities occurred:

- Monitoring occurred at ten sites along the White River where floodplain restoration, including manual control of Japanese knotweed, is occurring
- Trailheads and trails in and adjacent to the Breadloaf Wilderness were monitored for NNIS
- Sites where projects were proposed, including the Natural Turnpike and Upper White River integrated resource project areas, were monitored for NNIS
- Wild chervil that was reported from the Natural Turnpike integrated resource project area in FY07 was monitored again in FY08, followed by several volunteer days to hand-pull these plants along FR 54
- A cooperative weed management area (CWMA) was initiated in the Upper White River sub-watershed, with the goal of increased monitoring and collaborative control efforts

- Sites for 69 rare populations (Regional Forester Sensitive Species) were monitored for NNIS
- In the Lincoln-Ripton area, a new administrative study Appalachian Jacob's ladder (RFSS) began in FY08, and will include investigating the relationship between NNIS and the health of the rare plant population
- While no new monitoring occurred at ski areas in FY08, Mt. Snow continued to mow early to control wild chervil and hand-pull some purple loosestrife plants. Sugarbush also accomplished some early mowing for wild chervil.

The majority of this monitoring was completed by GMNF staff, contractors, the UVM Lands Crews, an intern from the Student Conservation Association and local volunteers. In the White River floodplain restoration project, groups of volunteers are also cutting back Japanese knotweed a minimum of three times per growing season, and the resulting infestation is monitored by GMNF. The administrative study on Appalachian Jacob's ladder is being accomplished through a cost-share agreement with UVM.

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 projects were monitored to evaluate the potential for NNIS to spread during project implementation, per Forest Plan direction. Monitoring rare plant populations occurred and an administrative study was begun to protect these areas from NNIS.

Last year we reported a need to form CWMA in geographic areas beyond the Lake Champlain Basin Invasive Plant Partners of Vermont. Since wild chervil and Japanese knotweed are widespread in the Upper White River sub-watershed, and both can be dispersed by water, wildlife, or road or construction equipment, development of a CWMA in this region appeared to be the best approach to controlling these species in this area. In FY08, several interested parties initiated



development of the Upper White River CWMA, encompassing the towns of Granville, Hancock, Rochester, and Stockbridge. One workshop was held on NNIS identification and survey techniques, and some private landowners turned in data from monitoring their own land, showing that NNIS are a problem on some of their own lands as well as on National Forest System lands. This same approach is desired for the Batten Kill watershed, but no new monitoring or related activities occurred there in FY08.

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; an indication of this is that volunteers were easily trained and assigned to projects.

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 FY08 was focused on the following trails within the Breadloaf Wilderness: Burnt Hill, Skylight Pond, the Long Trail (Middlebury Gap to Mt. Grant), Emily Proctor, and Clark Brook. No infestations were found, except on adjacent private land near the Burnt Hill trail head, suggesting that NNIS currently have little to no impact on the Wilderness resource within the Breadloaf Wilderness area.

Results from monitoring project areas continue to show that NNIS are sometimes present in surprising places, although often in small amounts. Repeat monitoring of wild chervil in the Natural Turnpike integrated resource project area suggested that the infestation had expanded substantially over what was recorded in FY07. Since wild chervil is a biennial species that is most easily detected when it flowers in its second year, the apparent increase may simply have been a more visible infestation due to presence of more second year plants. Several volunteer wild chervil pulling events were organized, resulting in removal of wild chervil from approximately three miles of roadside.

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, 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.

Rare plant populations were mostly free of NNIS, suggesting minimal impact to this resource, although other populations monitored in previous years did find some small infestations. A preliminary report on the relationship between Appalachian Jacob's ladder and NNIS is expected in FY09.

Recommendations: Investigate chemical means for continuing control of Japanese knotweed at sites where manual control is labor intensive and only minimally successful.

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.

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 writing and signing 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 rare plant monitoring to incorporate surveys for NNIS. 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.

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 FY07 M&E Report.

Monitoring Activities: FS Staff did not complete any first year evaluation surveys on plantations on the GMNF, as no trees were planted in 2008. Third-year survival examinations occurred on one 29 acre plantation, where 100% survival of trees within the sampled plots was found. 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. Surveys

were completed on 29 acres for the Patterson Brook sale and results are reported in the FACTS data base.



Evaluation and Conclusions:

Review of evaluation surveys completed in FY 2008 indicates that reforestation efforts underway are 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.

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 FY07 M&E Report.

Monitoring Activities: GMNF staff analyzed the size of even-aged regeneration harvest units (clearcuts, shelterwoods or variants) produced in timber sale offerings. In FY 2008, four harvest

units of these types of treatments were offered with the size of openings ranged from a minimum of less than 1 acre to one 8 acre opening being the largest.

See the FY 2007 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. Future efforts planned, including the Upper White River Project may better address this situation.

See FY 2007 M&E Report for additional details.

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. Initial planning for the Upper White River Integrated Resource Project (IRP) in FY 2008 shows there is opportunity to plan for and achieve larger temporary opening sizes. GMNF staff will continue to identify stands with the proper condition in future IRPs, and propose them for even-aged regeneration harvest as appropriate. We will continue to locate them away from areas where standards and guidelines or other desired resource conditions might limit cutting unit size to better achieve 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 FY 2007 M&E Report

Monitoring Activities: Using maps and current information, GMNF staff conducted field reviews for projects, including the Upper White River Project, during 2008. GPS units were used to help map wetlands, and to mark specific spots such as vernal pools and ledge outcrops. 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.

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 FY07 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 FY08, over 350 permits were issued for the following products:

Product	Quantity
Maple sap	1,450 taps
Firewood	527 cords
Dead/down wood	0
Christmas trees	166 trees
Boughs	3 tons
Seedlings	0
Saplings	0
Miscellaneous	0
Botanical samples (fungi)	250 lbs

During FY08, GMNF staff monitored maple sap permit areas during the sugaring season, no compliance issues were noted.

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.

Between June and September, most work on the agreement has been focused on developing interview questions, developing a recruitment strategy and interview materials, and recruiting individuals to interview. Most interviews will take place during the fall of 2008, with transcription, analysis and reporting occurring in the winter and early spring of 2009.

Evaluation and Conclusions: Accounting corrections have been made to the number of permits issued in FY08, and with these corrections, the number is closer to the low end of the range of permits issued over the past 9 years. The largest increase in permits and quantities in FY 2008 was for firewood, which was collected at more than three times the average quantity collected at the beginning of the decade, and more than two and a half times last year's quantity. This increase is probably due to the long-term increase in energy costs of heating oil over the past several years combined with the dramatic rise in costs during the first half of 2008. Maple taps were fewer this year than last but within the range of previous years. Other gathering continued at low levels similar to previous years. No environmental conditions of concern were noted in association with permits this year.

The increase in firewood requests is possibly the start of an upward trend, or at least a higher sustained level of use and interest than in recent years. 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 is expected to come out in FY2009. The new rule 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 initiated this year, and will be completed next year, will be critical in helping to establish these sustainable harvest levels.

Recommendations: Between 2009-2010, FS staff will make use of the results of the SFP study to establish preliminary sustainable harvest thresholds for SFPs gathered on the GMNF, identify any additional SFPs requiring permitting for sustainable use, develop specific monitoring guidelines for SFPs, and identify and plan for additional research needs.

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 FY2007 Monitoring and Evaluation Report.

Monitoring Activities: Nineteen sites with special features were monitored this year, including Beaver Meadows and Abbey Pond, Bryant Mountain Hollow, Texas Falls, Bristol Cliffs, Chandler

Ridge, Hat Crown/Silent Cliff, Leicester Hollow, Mount Abraham, The Cape, Rattlesnake Point, Burnt Mountain, Mt. Horrid, Devil's Den, Little Rock Pond, White Rocks, Grout Pond, Branch Pond, Thistle Hill, and Totman Hill Fen. Several additional sites in Wilderness were checked during the year by Wilderness staff. During this year's monitoring, several wildlife and fish biologists and technicians were trained to monitor the sites, and then monitored four of the 19 sites this summer. In addition, a botany crew available this summer visited many of the sites that included rare plants.

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, Rattlesnake Cliff, Burnt Mountain, Bryant Mountain Hollow, Chandler Ridge, Leicester Hollow, Mount Abraham, Mt. Horrid, Devil's Den, Little Rock Pond, Thistle Hill, and Totman Hill Fen.
- Rare plants were not relocated at Texas Falls, Bristol Cliffs, Hat Crown/Silent Cliff, The Cape, and White Rocks. These sites will be rechecked over the next few years to determine if the plants are gone from these sites. There were no obvious site impacts that could be observed to have contributed to the loss of these populations. The locations of some populations are not well-described and so may not be relocated without very intensive surveys or good luck.
- Texas Falls and Leicester Hollow were significantly affected by the flood of August 6, 2008. Fortunately, the 2008 monitoring occurred prior to the flooding by 1-2 weeks, so we have accurate baseline information from prior to the flooding. These sites will be monitored closely not only to gauge impacts from the flood, but also to monitor impacts of trail rehabilitation work planned for these sites in 2009-2010.
- 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 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.

GMNF Wilderness staff visited and monitored several sites within Breadloaf, Battell, Glastenbury, Big Branch, Peru Peak, and Lye Brook Wildernesses during FY2008. Ponds and cliff sites within these Wildernesses 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:

- Off-trail cutting of trees for snowboarding and skiing at Skyline Lodge/Skylight Pond area was a concern noted during winter monitoring.
- GMNF staff installed signs at Mount Horrid discouraging rock climbing on the cliffs due to rare plants. These signs were installed due to concerns noted last year regarding renewed interest in bouldering at the Mount Horrid site. During the rare plant survey at Mount Horrid, no impacts to plant populations were noted in association with recent rock climbing or bouldering.

- Rehabilitation of Little Pond area to meet Wilderness standards was started by GMNF staff, including blocking off a snowmobile trail that goes to the pond, removing structures, and revising ROGs for the site to recognize its Wilderness designation.

No new areas of potential or actual ecological significance were located this year. A plan amendment was initiated this FY 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 will be made during FY2009.

Evaluation and Conclusions: This year's monitoring was very successful with the addition of biological and botanical field crews who could assist in the monitoring. With continued cooperation between the ecology program and biological and botanical field crews, it may be possible to keep up with the 5-year monitoring cycle identified for these areas. Coordination between the botany and ecology program over site visits to areas that include rare plants could be improved to minimize duplication of effort and maximize monitoring effectiveness.

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.

After two full years of monitoring, it has become clear that impacts to the integrity of sites and features are most often associated with recreational uses. A stronger relationship between recreation and ecology staff is important to effectively mitigate some of these impacts. There have been a lot of changes in staffing and responsibilities within the recreation program over the past year which has made coordination more of a challenge. We are looking to FY2009 to start building this closer working relationship to facilitate management of these special areas.

Recommendations: In FY2009, we intend to continue to monitor around 12 sites with significant ecological features on the GMNF with help from available biological and botanical crews. This includes monitoring two sites (Texas Falls and Leicester Hollow) that were impacted by flooding in 2008 and have rehabilitation activities planned. Coordination between botany and ecology programs over monitoring plans will occur prior to the field season to improve effectiveness of joint monitoring.

New inventory is planned for the area of the GMNF in Dorset and Peru to check ecological conditions and potential sites for significant ecological features. If potentially significant sites are identified, they will be evaluated more intensively with the VNNHP, and if warranted may be proposed for special management provisions.

During development of the final decision on the plan amendment for the New England Wilderness Act "leftovers", we hope to include language in the Wilderness and Remote Backcountry management area direction specifically protecting the significant ecological features contained within them, including the current Mount Horrid cRNA.

It is also our intent this year to work more closely with recreation staff to plan actions to mitigate issues raised during special area monitoring. We hope to 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.

Insect or Disease Agent	Organization & Date of Monitoring	Type of Monitoring Effort
Forest tent caterpillar, gypsy moth, oak leaf-tier and dieback or mortality from unknown agents	Northeastern Area State & Private Forestry, Northeastern Area, USDA Forest Service, July 28, 29, 30 & August 1, 2008	Annual Aerial Detection Survey of forest health conditions on the Green Mountain National Forest

Monitoring Activities: In FY 2008, an annual insect and disease aerial monitoring effort was again undertaken on the Green Mountain National Forest, organized by the Northeastern Area, State and Private Forestry. Table 2.1-8 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 2008, there were no significant outbreaks detected from any major pest. The high levels of forest tent caterpillar from previous years declined to less than 1,000 acres. Roughly 500 acres of defoliation and 165 acres of tree mortality on the Manchester Ranger District were attributed to that insect species. Aerial detection resulted in mapping of roughly 3,730 acres of damage, slightly more than found in 2007, but a dramatic decrease from the 161,000 acres mapped in 2006. On the Middlebury Ranger District, light to moderate defoliation from gypsy moth was found, only occurring on shallow soils near Brandon. Additionally, aerial reviews found mortality of birch and aspen trees from species competition on 229 acres in Chittenden.

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



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 FY07 M&E Report

Monitoring Activities: In FY08 there were 4 reportable wildland fires suppressed at the initial attack stage on Forest Service land on the Green Mountain National Forest (GMNF). These fires resulted in zero lost structures and zero injuries. The Stone Hollow fire was started on private property and burned a total of 13 acres, about 6 acres of National Forest lands, the 3 other fires were on the border of private and NFS lands, all of these were kept under 1 acre during initial attack.

GMFL	Date	District	State	Acres	Cause
Stone Hollow	April 19, 2008	Middlebury	VT	13	Human
Hals Landing	April 25, 2008	Manchester	VT	.10	Human
Picnic	April 27, 2008	Manchester	VT	.10	Human
White Rocks	May 12, 2008	Manchester	VT	.50	Human

Evaluation and Conclusions: Human caused fire ignitions continue to be the primary ignition source for the GMNF. Fire preparedness and suppression needs in response to fire activity in FY08 were sufficient. All fires in FY08 were on or near the boundary of Forest lands which stresses the importance of coordination with local fire departments, which was strong in all cases. There was adequate suppression preparedness, monitoring of weather predictive services, and incident response to all the wildfires.

Recommendations: Fire preparedness and suppression is geared to small, short duration fires, however, GMNF staff recognizes the need to establish improvements related to the preparedness and management of more complex fires (Type 3 and higher). Focused training relating to the management and response for complex fires will be an important future focus for fire managers, Incident Commanders, Agency Administrators, firefighters, and support staff.

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 Report

Monitoring Activities: The GMNF staff accomplished a variety of hazardous fuel treatments by utilizing mechanical efforts and prescribed fire implementation.

In total there were 133 acres treated to reduce hazardous fuels in the Wildland Urban Interface (WUI) in FY08.

- 66 acres were treated in Middlebury and Rochester RD (20 of these were mechanical).
- 67 acres were treated in Manchester RD (all prescribed fire).

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 the Forest Activity Tracking System (FACTS).

Evaluation and Conclusions: The use of prescribed fire and mechanical treatments to reduce hazardous fuels was effective in FY08. Mechanical treatments targeted woody vegetation encroachment, and in particular larger diameter vegetation that would be more difficult to injure and/or kill if prescribed fire was used exclusively. All of the hazardous fuels treatments also provided secondary benefit objectives, which include ecosystem restoration and wildlife habit maintenance and improvement.

Recommendations: Due to the short windows of opportunity to implement prescribed burns, mechanical treatments provide an effective alternative, as they can be conducted throughout the year, in a variety of weather conditions. Therefore, hazardous fuels reduction using mechanical means should be increased. Due to the higher costs per acre associated with mechanical treatments than with prescribed fire, more efficient technologies and workforces should be evaluated, and used to minimize costs.

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 FY07 M&E Report

Monitoring Activities: Prescribed fire planning was accomplished in FY08. There are two main objectives associated with each burn plan; one objective focuses on broad resource results, and the other targets specific fuel reduction results. In general, the resource objectives are: to truncate approximately 80% of invading woody vegetation consisting of shrubs and tree seedlings/saplings through repeated fire entrances; and to 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 with the acceptable range of results reducing the 1- hour fuels by 75% and 10-hour fuels by 50%,

Four units totaling 103 acres were burned using prescribed fire in FY08. Pre and post burn monitoring was conducted on all of the prescribed burns implemented in FY2008. Monitoring focused on measuring pre and post burn fuel accumulations as well as examining fire's effects on reducing woody encroachment (mortality).

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 into 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.

Recommendations: Prescribed fire will continue to be an effective tool for managing hazardous fuels on the GMNF. In future years, track fire weather and behavior, as well as post-burn vegetative effects by recording burn day data and establishing photo points (taken both before and after burning). This information will provide a biology-based study on fire effects as related to burn conditions.

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 FY07 M&E Report

Monitoring Activities: In FY2007, the Fire Management Plan included Wildland Fire Use (WFU) as a viable management option for specific management areas on the GMNF. Fire management staff was trained on Wildland Fire decision support tools (WFIP) and procedures. Communications began with external partners -State of Vermont/Vermont Fire Departments (VFD's) - on this new management option. There were no naturally ignited wildfires that met WFU criteria in FY 2008.

Evaluation and Conclusions: The GMNF was well prepared administratively for managing WFU fires. Due to no WFU fires occurring in FY2008, 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 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.

Monitoring Activities:

Purchases and Donations: In FY08, one purchase and one donation totaling 119 acres occurred in the Town of Shaftsbury. These lands will provide for forest products, dispersed public recreation use, and deep woods wildlife species. They also contain a tributary of Furnace Brook, a popular trout fishing stream.

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. The parcels meet the Green Mountain National Forest Plan (Forest Plan) guidelines for land purchase by providing “uncommon biological qualities.”

Also occurring in FY08, was the purchase of a large parcel (392 acres) near Mount Snow in Dover. The land has been identified as important for black bear, both as fall feeding habitat and for providing a forested buffer between human activities associated with the downhill ski areas, and surrounding condominium and seasonal home developments. The wildlife habitat and corridors located on the property meet Forest Plan guidelines for land acquisition.

Purchase of this land will expand the watershed conservation area of Cold Brook, whose headwaters originate on the GMNF, thus conserving the watershed and fisheries habitat (both Forest Plan goals). Located on the parcel are 2 trails that connect to trails on GMNF land, and are used for cross country skiing, mountain biking, hiking and snowmobiling.

An additional donation that occurred in the town of Readsboro, was a small parcel off Route 8, which will provide public and administrative access in area where such access to GMNF lands is lacking.

Rights of Ways: A right of way in Winhall was donated to provide administrative access for the Nordic Timber Sale, and will remain in place for future administrative activities, including forest management and habitat restoration.

Boundary Adjustments: Sec. 8301 (Green Mountain National Forest Boundary Adjustment) of the 2008 Farm Bill – Food, Conservation, and Energy Act of 2008 authorized modification of the boundary of the GMNF to include 13 designated expansion units encompassing approximately 6,125 acres. There are 1,846 acres of federal land or federal interest in land and 4,279 acres of private land within the units. Of the acres of federal lands, 499 acres are within two established Purchase Units. This put areas already purchased by the FS within the designated boundary of the GMNF. The boundary of each unit was based on either the actual property line of the federal parcel, or where more than one federal parcel was involved, natural topographic features such as roads, streams, town lines were used as the unit boundary.

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 us in FY08 was The Conservation Fund, who brought forward an outstanding parcel in Jamaica for future purchase, and has been working with the GMNF District Ranger and lands staff to identify other critical lands for future

acquisitions. GMNF staff also appreciate the numerous rights of ways granted from individual landowners to benefit the Nordic Timber Sale, planned for the south half of the Forest. 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

Contemporary uses of special forest products in and around the Green Mountain and Finger Lakes National Forest. This research project has been undertaken as an agreement between the University of Vermont and the GMNF to document current uses of Special Forest Products in and around the Green Mountain and Finger Lakes National Forests. Findings will broaden understanding of forest uses and values of local communities, and provide a basis for sustainable management of these products. This research involves Marla Emery, a Research Geographer with the Northern Research Station; Clare Ginger, and Associate Professor with the University of Vermont; Virginia Nickerson, a local Ethnographer, and Diane Burbank, an Ecologist with the GM&FL NFs.

Parameterization of a Multiplicative Stomatal Conductance Model (DO3SE) to Estimate Seasonal Ozone Uptake in Northeastern Red Spruce Ecosystems

The objective of this study is the quantification of the ozone sensitivity of red spruce under natural conditions and to build an extensive dataset for detailed characterization of seasonal variability in gas exchange and ozone uptake. Two study sites were selected outside of the Lye Brook Wilderness boundary and a third site on Stratton Mountain with data collected in two successive seasons (2008 – 2009).

An Inventory of Amphibians and Reptiles in and Around Crystal and Haystack Ponds on Haystack Mountain in Wilmington, Vt.

The results of this survey will be used for comparison of other amphibian and reptile populations throughout southern New England to provide a better understanding of geographic variation in size and other life history variables. This catch, photograph, measure and release project was carried out by an independent private researcher from Acton, MA. This study was originally planned for 2007, but an extension was given to continue through October 2008.

Vermont Odonata (dragonflies and damselflies) Survey

This project was also part of the state-wide Odonata survey. The researcher focused his surveys on GMNF peatlands because there are few opportunities for survey work in bogs and fens in southern Vermont. The project proponent, an independent researcher from Plainfield, Vt. worked under a State Wildlife Grant from the State of Vermont. This project was begun in 2007, and will continue through the field seasons of 2008 and 2009.

Disturbance History of a Forested Wetland near the Battell Research Forest on the Green Mountain National Forest, Middlebury, VT, USA

The goal of this study is to reconstruct forest stand dynamics and disturbance history from tree rings (age structure) and sediment cores (long-term changes in plant community composition) at a forested swamp. Analysis of pollen and other plant parts as well as charcoal found in sediment cores will broaden the understanding of disturbance and forest development.

Amphibian Monitoring in the Lye Brook Wilderness Region of Green Mountain National Forest

Amphibians at two sites in the vicinity of Lye Brook Wilderness are monitored periodically (1993 – 1995 and 2002). The present round of monitoring was begun in spring 2008 and will continue through the field seasons of 2009 and 2010. Drift fences and collection cans are used to collect amphibians after rain events. The captured amphibians are identified, measured, checked for abnormalities and then released.

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.

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
Pat D'Andrea	Realty Specialist
Mary Beth Deller	Botanist
Kathleen Diehl	Partnership and Conservation Education Coordinator
Kathy Donna	NEPA Coordinator
Diana Wormwood	Law Enforcement Program Assistant
Pam Gaiotti	Budget and Accounting Officer
Rob Hoelscher	Wildlife Biologist
John Kamb	Engineer
Dave Lacy	Archaeologist and Heritage Resource Specialist
Donna Marks	Landscape Architect
Bill Peterson	Forest Management Program Manager
Kristi Ponzoso	Public Affairs Officer
Steve Roy	Wildlife and Fisheries Program Manager
Erin Small	Fire Planner
Doreen Urquhart	Realty Specialist
Chad VanOrmer	Recreation, Wilderness and Heritage Program Manager

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 2008 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 2008 was made in January of 2009. (see table for 2008).

County	Town	Acres	PILT 2008	Secure Schools 2008
Addison	Bristol	5528	12,611	5,911
Addison	Goshen	7562	17,317	8,086
Addison	Granville	14895	33,869	15,905
Addison	Hancock	19287	44,167	20,623
Addison	Leicester	2746	6,288	2,936
Addison	Lincoln	11375	24,913	12,163
Addison	Middlebury	3366	7,456	3,599
Addison	Ripton	22204	50,840	23,742
Addison	Salisbury	3830	8,771	4,095
Addison Total		90793	206,232	97,060
Bennington	Arlington	3333	7,633	3,564
Bennington	Bennington	1292	2,959	1,382
Bennington	Dorset	5577	12,339	5,963
Bennington	Glastenbury	26630	34,706	28,474
Bennington	Landgrove	811	1,848	867
Bennington	Manchester	5503	12,380	5,884
Bennington	Peru	17235	39,356	18,429
Bennington	Pownal	4062	9,302	4,343
Bennington	Readsboro	8304	19,014	8,879
Bennington	Rupert	168	614	180
Bennington	Searsburg	7632	14,122	8,161
Bennington	Shaftsbury	1353	4,388	1,447
Bennington	Stamford	11823	27,075	12,642
Bennington	Sunderland	21932	50,114	23,451
Bennington	Winhall	15918	36,209	17,021
Bennington	Woodford	26752	57,367	28,605
Bennington Total		158325	329,426	133,167
Essex	Granby	1660	3,801	1,775
Essex Total		1660	3,801	1,775
Rutland	Brandon	89	204	95
Rutland	Chittenden	29409	67,347	31,446
Rutland	Killington	1791	8,736	1,915
Rutland	Mendon	3203	6,352	3,425
Rutland	Mt. Holly	3360	7,694	3,593

County	Town	Acres	PILT 2008	Secure Schools 2008
Rutland	Mt. Tabor	25117	30,854	26,857
Rutland	Pittsfield	7698	17,628	8,231
Rutland	Wallingford	8560	20,770	9,153
Rutland Total		79227	159585	84,715
Washington	Warren	7224	16,211	7,724
Washington Total		7224	16,211	7,724
Windham	Dover	5640	12,018	6,031
Windham	Jamaica	720	3,295	770
Windham	Londonderry	437	1,608	467
Windham	Somerset	9423	12,052	10,076
Windham	Stratton	18238	25,942	19,501
Windham	Wardsboro	3,104	7,108	3,319
Windham	Wilmington	1750	4,008	1,871
Windham Total		39312	66,031	42,035
Windsor	Rochester	12600	28,840	13,473
Windsor	Stockbridge	810	1,862	866
Windsor	Weston	9104	20,848	9,735
Windsor Total		22514	51,550	24,074

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

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

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

**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 Listⁱ

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		
<i>Heracleum mantegazzianum</i>	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.		
<i>Aegopodium podagraria</i>	goutweed	Medium/Insignificant
<i>Ailanthus altissima</i>	tree-of-heaven	Medium/Low
<i>Alliaria petiolata</i>	garlic mustard	High/Medium
<i>Butomus umbellatus</i>	flowering rush	Medium/Low
<i>Celastrus orbiculatus</i>	Oriental bittersweet	High/Medium
<i>Hydrocharis morsus-ranae</i>	frogbit	
<i>L. maackii</i> , <i>L. morrowii</i> , <i>L. tatarica</i> , & <i>L. x bella</i>	Shrubby honeysuckles (amur, morrow, tatarian, & Bell's honeysuckle)	
<i>Lonicera japonica</i>	Japanese honeysuckle	High/Medium
<i>Lythrum salicaria</i>	purple loosestrife	
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	High
<i>Nymphoides peltata</i>	yellow floating heart	
<i>Phragmites australis</i>	common reed	
<i>Polygonum cuspidatum</i>	Japanese knotweed	
<i>Potamogeton crispus</i>	curly leaf pondweed	Medium
<i>Rhamnus cathartica</i>	common buckthorn	High/Medium
<i>Rhamnus frangula</i>	glossy buckthorn	
<i>Trapa natans</i>	water chestnut	Medium
<i>Vincetoxicum nigrum</i> (= <i>Cynanchum louiseae</i>)	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
<i>Acer platanoides</i>	Norway maple	High/Medium
<i>Anthriscus sylvestris</i>	wild chervil	
<i>Berberis thunbergii</i>	Japanese barberry	High/Medium
<i>Berberis vulgaris</i>	common barberry	
<i>Centaurea biebersteinii</i> = <i>C. maculosa</i>	spotted knapweed	High/Medium
<i>Rosa multiflora</i>	multiflora rose	Medium/Low

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