USDA

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Forest
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**Eastern
Region**

R9-GM-ME
Report

September
2007

Green Mountain National Forest

Annual Monitoring and Evaluation Report

Fiscal Year 2006

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Annual Monitoring and Evaluation Report

Green Mountain National Forest

USDA Forest Service
Eastern Region
Milwaukee, Wisconsin
September 2007

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Executive Summary

This is the first Annual Monitoring and Evaluation (M&E) Report compiled under the 2006 Green Mountain National Forest (GMNF) Land and Resource Management Plan (Forest Plan). The Forest Plan was signed by Regional Forester, Randy Moore, in February, 2006 with Plan implementation beginning in May, 2006. The Forest Plan includes a monitoring and evaluation plan (Chapter 4). As explained in more detail in Chapter 4, monitoring items consist of mandatory components you will find 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 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 Forest 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

In addition, information gained from the Annual M&E Report will:

1. Provide a reliable snapshot on how well the Forest Service is achieving Forest Plan direction
2. Validate effectiveness of management practices towards achieving desired future conditions and providing an output of goods and services
3. Provide the status of Forest Plan amendments, errata, and administrative corrections
4. Highlight coordination with research and other agency/institution monitoring efforts
5. Summarize the available information on Management Indicator Species
6. Highlight Forest-wide projects or programs

The information gained from the Annual M&E Report is used to determine how well the desired conditions, goals, objectives, and outcomes of the Forest Plan have been met (items (i) and (iii) above). Following just five months of implementation of the revised Forest Plan however, trends, patterns, and results are not clearly defined. Therefore, evaluations and conclusions that would lead to changes in the Forest Plan are not expected (items (ii) and (iv) above). Rather, this report focuses more on what was monitored, how it was monitored, how easy and how efficient the monitoring protocols were to use, and how effective they were at answering the monitoring questions.

This report is of value for the public and Forest Service leadership, managers, and employees. The Annual M&E Report describes to the public how their public lands are being managed and how effectively the commitments made to them through the revised Forest Plan are being met. The Annual M&E Report also provides a readily available reference document for Forest Service managers as they plan, evaluate the effects of actions on resources, and implement future projects.

Key Events and Achievements in Fiscal Year 2006

Completion of 2006 LRMP

The 2006 Forest Plan for the GMNF was released in March, 2006. The revised Plan was completed following the procedures of the 1982 planning rule. Major issues addressed through the Plan revision included: wilderness and other special areas recommendations and designations; biodiversity and ecosystems management; social and economic concerns; recreation management; and timber management. Highlights of selected issues include:

Special Designations

- Recommendation of an additional 27,473 acres for Wilderness Study.
- Addition of 29,645 acres of special areas (Escarpment, Recreation Special Areas, Ecological Special Areas, Research Natural Areas, Alpine/Subalpine Special Areas, and the Moosalamoo Recreation and Education Area).

Biodiversity and Ecosystem Management

- Increased acres available for enhancement and creation of upland openings, aspen/birch, and oak communities.
- Creation of an ecological reference network placing at least 5% of each ecological type in a management area that provides for the development of old growth.

Recreation Management

- Reduction in the acreage of management areas where summer-use ATV trails could potentially be located in addition to requirements that any summer-use ATV trail development only be considered where trail network connectivity is required as a part of a larger state-wide trail network located on other land ownerships.

Timber Management

- The allowable sale quantity (ASQ) in the revised Plan will be 16.4 million board feet (MMBF) per year. The ASQ in the 1987 Plan was 15.6 MMBF per year.

Development of Monitoring Guide

During revision of the Forest Plan, a framework for developing Monitoring and Evaluation (M&E) guidance outlined five major components:

- *A Monitoring Plan* that provides *broad, strategic* guidance (this is contained in Chapter 4 of the 2006 Forest Plan)
- *A Monitoring Guide* that identifies *monitoring* items and provides *technical* guidance
- *An Annual Monitoring Schedule or Work Plan* that provides *annual*, *specific tasks* for the current year
- *An Annual Monitoring and Evaluation Report* that interprets and synthesizes monitoring data
- *A 5-year comprehensive r*eport that evaluates current social, economic, and ecological conditions and trends that contribute to sustainability (Need for Change)

After signing the 2006 Forest Plan, the Forest Service focused efforts on developing the Monitoring Guide. The Guide provides specific information on implementing the monitoring strategy outlined in Chapter 4 of the 2006 Forest Plan. During development of the Monitoring Guide, the importance of including only those items necessary to meet the intent of measuring and evaluating the implementation, effectiveness, and validation of the Forest Plan was emphasized. Monitoring tasks were designed to link directly to monitoring questions in Chapter 4 of the 2006 Forest Plan.

The Monitoring Guide contains a menu of activities from which monitoring actions may be selected; there is no requirement to achieve the entire list of activities. A set of questions was identified to assist in the prioritization of monitoring tasks. Monitoring Guide activities are included in the Annual Monitoring Schedule based on priorities and funding availability. The Monitoring Guide is available at: http://www.fs.fed.us/r9/gmfl/nepa_planning/monitoring_and_evaluation_reports/index.htm

The M&E Guide is intended to be flexible and may be modified in response to new information, updated procedures or protocols, emerging issues, and budgetary considerations without amending the Forest Plan. The Guide establishes priorities to ensure efficient use of limited time, money, and personnel. A draft Monitoring Guide was completed in Fiscal Year 2006 and the Final Monitoring Guide was completed in June of 2007.

Emphasis Areas

Following completion of the 2006 Forest Plan, much discussion took place about how to transition the Green Mountain National Forest from planning mode to implementation mode in a manner that maximized efficiency, aligned efforts across program areas, and resulted in tangible achievements towards meeting Forest Plan goals and objectives in a way that is supported by and meaningful to the public. The Forest Service determined the need to identify where efforts would be focused in the first three years of implementation under the 2006 Forest Plan. As a result, the concept of Forest Emphasis Areas was developed.

All Forest Service associates were asked to help identify key areas to focus efforts once the 2006 Forest Plan was in place. Based on this feedback, a series of 5 roundtable discussions were held around the following topics: natural resources, access management, customer/public service, facilities, and internal processes. Each roundtable discussion was centered on three questions: 1) What are the trends that will influence the management of public lands in the next 3-5 years? 2) What do external partners and publics expect in the next 3-5 years? 3) What are our greatest opportunities and needs in the next 3-5 years? A tremendous amount of information was collected through these roundtables. As a result, the Forest Service agreed on a list of three final Forest Emphasis Areas based on the feedback that was received:

1. By March 31, 2008, the Forest Service will develop a timeline to complete a travel management plan (roads and trails) for the GMNF. The milestones included in the timeline are: a) complete a Wheeled Motorized Use Map; and b) identify and inventory all known unauthorized roads and trails on the GMNF. The GMNF will complete travel analysis (roads and trails) per Forest Service Manual and Handbook direction for all significant projects, and incorporate those recommendations into the wider travel management plan.
2. Over the next 5 years, the Forest Service will identify and develop integrated resource projects in areas where a) there are multiple resource needs or opportunities, b) local town or interest group support, c) minimal resource conflicts, and d) results in reduced unit costs and increased implementation shelf stock. The GMNF staff will 1) identify and prioritize project areas for the next fiscal year, and 2) establish criteria that will be used to delineate and prioritize project areas for the next 3-5 years. Integrated resource projects will result in increased efficiencies across program areas by using commercial timber sales, stewardship contracts, partnerships and challenge-cost share agreements. In addition, non-commercial vegetative management will be used to improve ecological conditions, such as habitat and age class or composition goals, and to improve resource conditions, such as trails or recreation infrastructure needs.
3. By 2009, all teams and associates on the GMNF will increase public service through information delivery, appearance, and behavior.

Forest Emphasis Areas are meant to provide focus in the planning and development of Forest Service work. They were designed to be specific enough to guide teams in the development of their annual program of work and help Forest Service staff choose how and where to spend our limited resources (ie. time, money, energy) while being flexible enough to adapt to changes in the environment over the 3-5 year time period. Forest Emphasis Areas do not represent “new work” but simply a way to align the work that the Forest Service already does in a manner that maximizes efficiency through targeting efforts in collective goals.

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 objectives 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.

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 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/ Michael Liu Date: September 27, 2007

for

MARGARET MITCHELL
Forest Supervisor

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1.1 INTRODUCTION

1.1.1 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.

1.1.2 Monitoring and Evaluation Guide

In addition to the guidance outlined in the 2006 Forest Plan, the Green Mountain National Forest 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. The Forest Service will select specific monitoring activities from the M&E Guide during Forest Plan implementation.

1.1.3 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 Green Mountain National Forest.

Due to Forest Plan revision efforts, an Annual M&E Report was not generated for Fiscal Year 2005. This Annual M&E Report evaluates the results of the monitoring accomplished during Fiscal Year 2006, following implementation of the 2006 Forest Plan (May 2006-September 30, 2006), hereafter referred to as FY06. 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 FY06.

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 FY06.

In FY06 however, the Forest Service was in a period of transition between the 1982 Forest Plan and the 2006 Forest Plan on the GMNF. Monitoring and evaluation efforts are presented to the greatest extent possible given just five months of implementation of the 2006 Forest Plan.

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.

1.1.4 Partnerships and Collaboration

Partnerships and collaboration are essential throughout all levels of the Forest Service. Retired Chief of the Forest Service Dale Bosworth has stated that *"As we enter the Forest Service's second century of caring for the land and serving people, a strong spirit of partnership and collaboration is more important than ever."* The Green Mountain National Forest (GMNF) has worked with partners throughout its history to achieve social, economic, and ecological goals. Each year the GMNF continues relationships with existing cooperators and enters into new ones. This collaboration has resulted in increased public service and improved land stewardship, both which enhance the Forest Service's effort to meet desired conditions. This overview will share information on both formal agreements and informal cooperative efforts. Information is presented as a collective report for the Green Mountain and Finger Lakes (GMFL) National Forests for FY06 as the information is tracked regionally in a combined report.

Formal Agreements:

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

During FY06, there were a total of 19 signed grants and agreements that provided or obligated $404,013.13 worth of cash, goods, and services to the GMFL from partners, and $383,370.76 worth of cash, goods, and services to partners from the GMFL.

Volunteer Agreements

In FY06, 564 volunteers provided 24,624 hours of service at an appraised value of $444,217 to the Green Mountain and Finger Lakes National Forests.

Total to the Forest:
Including formal and volunteer agreements, partners gave a total value of $404,013.13 to the GMFL in FY06. This includes cash contributions of over $160,000, in-kind contributions of over $27,000, and non-cash contributions of over $216,000.

Total to Partners:
Contributions also went to various partners for the work they provided to support the GMFL. In FY06, there was over $317,000 in funds and over $65,000 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.

2.1 DISCUSSION OF MONITORING

The following table 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. They are presented in the remainder of Chapter 2 in the same order presented in the table.

Table 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	Vegetation	Are harvested lands adequately restocked according to Plan goals?	Lands are adequately restocked as specified in the Forest Plan.	Annual
8	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

9	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
10	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
11	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
12	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
13	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
14	Recreation	Is the quality of the Forest Service trail system and recreation facilities being improved through operation and maintenance?	Forest Plan Goal 12	Annual
15	Wilderness	To what extent is Wilderness managed to preserve its Wilderness character?	Forest Plan Goal 13	Annual
16	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
17	Interpretation and Education	In what way is the Forest providing information and education opportunities that enhance the understanding of the GMNF?	Forest Plan Goal 19	Annual

1. Outputs and Services

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.

Evaluation Question #1:

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

Background: This monitoring element is used to determine if timber sale outputs for the GMNF are being accomplished as outlined in Appendix D of the Forest Plan. In Appendix D, Table D-5 lists a summary of the proposed management practices that could be expected to occur on the GMNF over the first decade of Forest Plan implementation. Probable timber volume offered and sold for the first decade of 164 million board feet (mmbf) would translate to an average offering of 16.4 mmbf in any given year.

Monitoring Activities: The Timber Sale Accounting (TSA) and Periodic Timber Sale Accomplishment Reporting (PTSAR) databases were used to monitor the level of Forest Plan outputs related to timber offered and sold. For FY06, a combined 4.87 mmbf (7,891 hundred cubic feet (ccf)) of all accountable forest products was offered and sold on the GMNF.

Evaluation and Conclusions: With only one year of Forest Plan implementation underway, it is too early in the monitoring effort to indicate if the probable timber volume offered of 164 mmbf for the decade will occur. First year monitoring indicates that the forest offered approximately 30% of the planned annual average of wood fiber (sawtimber, pulp, firewood, misc. products).

Recommendations: Continue to monitor forest products offerings.

Evaluation Question #2:

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?

Background: This monitoring element is used to determine if resource outputs for the GMNF are being accomplished as outlined in Appendix D of the Forest Plan. In Appendix D, Table D-5 lists a summary of the proposed management practices that could be expected to occur on the GMNFover the first decade of Forest Plan implementation.

Monitoring Activities: This question will be addressed in a comprehensive analysis in the FY07 report.

2. Costs

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.

Evaluation Question #1:
To what extent is the Forest Service providing a mix of products, services, and amenities?

Background: This monitoring compares the level of expected socioeconomic outputs with actual levels. It also compares actual and estimated costs by program area.

Monitoring Activities: This question will be addressed in a comprehensive analysis in the FY07 report.

3. Forest Plan Objectives

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

Monitoring Driver: Forest Plan Objectives

Evaluation Question #1:
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?

Background: Wildfire has typically played a small-scale ecological disturbance role within the GMNF. Large fires have occurred in the past but most were a result of human activities such as land clearing and logging slash. The GMNF has had 33 wildfires totaling 391 acres during the 20-year period from 1983 to 2002. This averages approximately 3.4 fires per year burning a total of 8.2 acres annually. Ninety-eight percent of the wildfires occurring on the Forest have been human-caused. Although most current day wildfires are relatively small on the GMNF, nearly all of the wildland fires that have occurred have been within the wildland urban interface (WUI).

The Wildland Urban Interface (WUI) is considered to be those areas where human development and the "wildland" intermix and which are prone to wildfires or the rapid spread of wildfires under certain climatic conditions. Factors including fuels, slope of the land, and climate are all taken into consideration when determining whether or not property is susceptible to wildfire. On the GMNF, factors that contribute to increased fuel loadings and potential fire hazards close to encroaching development include ice storm damage, logging slash and natural thinning from second-growth timber stands that are over-stocked.

Although not causing the widespread damage to property that occurs in western U.S. forests, the potential for destructive wildland fire is increasing on the GMNF as development on private lands intermingled with NFS lands continues to rise.

Monitoring Activities: In FY06, there were 6 reportable wildland fires that were suppressed by Forest Service personnel. These fires resulted in no injuries or structures being destroyed. All of these fires were of short duration, low in complexity, and requiring minimal fire staff for suppression efforts. The fires included:

GMNF	Date	District	State	Acres	Cause
Party Fire (001)	April 20, 2006	Manchester	VT	0.1	Arson
Yaw Pond Rd Fire (002)	May 9, 2006	Manchester	VT	1	Arson
Lost Pond Shelter Fire (003)	November 24, 2006	Manchester	VT	0.05	Arson
Pownal Plane Fire (004)	August 4, 2006	Off-forest (Manchester)	VT	0.25	Plane Crash
Fassett Hill Fire (005)	July 18, 2006	Off-forest (Rochester)	VT	5	Escape pile burn
Yigal Fire (006)	December 9, 2006	Manchester	VT	0.1	Arson

Evaluation and Conclusions: As demonstrated in FY06, human caused fire ignitions have and will remain the primary ignition source for the GMNF. Fire preparedness and suppression needs in response to the fire activity within FY06 was adequate with adequate monitoring of predictive services, sufficient preparedness of suppression personnel and equipment , as well as organizational response and incident management to all the wildfires.

Recommendations: Fire preparedness and suppression is geared to small, short duration fires, however, the Fire Management Team 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 important and future focus for Fire Managers, Incident Commanders, Agency Administrators, Firefighters, and support staff.

Evaluation Question #2:

Are substrate (stream bottom) embeddedness and sedimentation levels within the range described in the Forest Plan and are they providing high quality spawning and rearing habitat for native fish species and macroinvertebrates?

Background: The Forest Service has been inventorying and monitoring streams and rivers for substrate embeddedness since 1988 in compliance with the 1987 Forest Plan. To date, about fifty streams totaling over 300 miles have been surveyed. Substrate embeddedness or sedimentation monitoring provides a quantitative measure from which fish spawning and rearing habitat can be evaluated and assessed for trends over time. Low embeddedness and sedimentation provide higher quality habitat for fish and macroinvertebrate species, and are indicative of more stable aquatic ecosystems. A Forest Plan objective is to maintain, enhance, or restore fish habitat using principles of stream geomorphology and habitat management, to provide less than 50 percent substrate embeddedness in rearing areas and less than 20 percent silt and/or sediment in spawning, gravel habitat.

Monitoring Activities: Substrate embeddedness and sedimentation monitoring was conducted in eight sites on seven streams in 2006. These streams included: Bingo, Bolles, Clark, Lamb, Sucker and Utley Brooks as well as the South Branch of the Middlebury River.

Evaluation and Conclusions: A preliminary review of the data collected in 2006 indicates that spawning and rearing habitat quality is good and is supporting self-sustaining populations of native fish species in these streams. A more comprehensive, detailed analysis of data will be done every five years based on information found in the GMNF Monitoring Guide.

Recommendations: Continue to conduct regularly scheduled monitoring in FY07.

Evaluation Question #3:

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

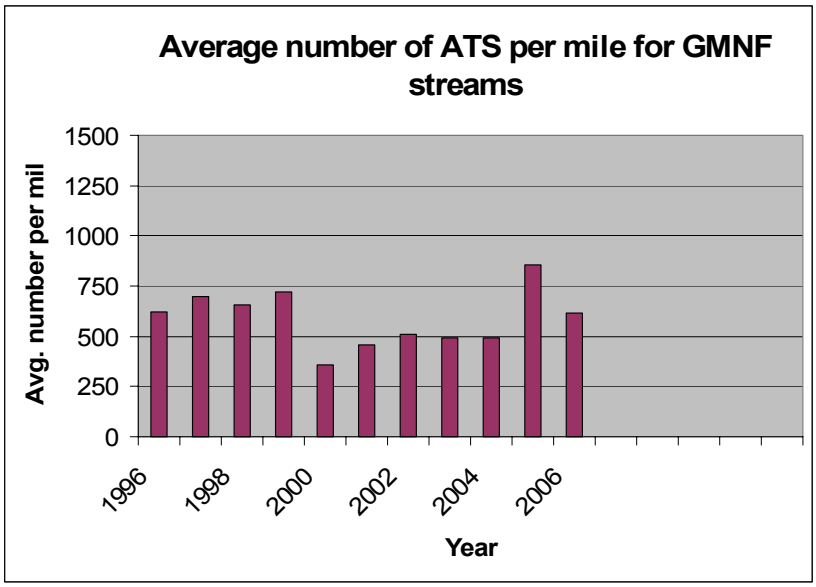
Background: Since the early 1980s, the Forest Service has been a cooperator in the inter-state, inter-agency effort to restore anadromous (sea-run) Atlantic salmon to historic habitats in the Connecticut River Basin. In 1987, the GMNF became a formal member of the Technical Committee for the Connecticut River Atlantic Salmon Commission (CRASC). Forest Service fisheries biologists have been conducting salmon restoration activities since that time. One of these important activities is monitoring juvenile (parr and smolt) salmon populations in streams on the GMNF. Most of the monitoring occurs annually in the White River and West River watersheds for approximately 15 streams. Each year all agencies involved in the program provide data to CRASC so assessments of salmon production Basin-wide can be reported and if necessary, management changes prescribed. An objective in the 2006 Forest Plan is to enhance salmon populations through spawning, stocking, and habitat protection and restoration.

Monitoring Activities: Atlantic salmon population monitoring was conducted at 19 sites in 16 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 2006 indicates that juvenile Atlantic salmon populations in GMNF streams are healthy. Atlantic salmon populations, like other fish and wildlife species, are constantly changing from year to year due to both management activities and naturally occurring events. The 2006 population of 612 salmon per mile is lower than the 2005 level but is slightly higher then the 10 year average of 585 salmon per mile. Overall, the number of juvenile salmon in GMNF streams over the past ten years has been quite stable, as shown in Figure 1. 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 2008.

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

Figure 1. Average number of Atlantic salmon per mile in GMNF streams.



Evaluation Question #4:

To what extent have hazardous fuels been reduced?

Background: There is concern that increased fuel loading across the GMNF will lead to an increasing risk of larger wildfires occurring within the wildland urban interface (WUI) areas. Currently, timber harvesting and mechanical treatments are the primary management tools used to reduce hazardous fuels and meet ecological objectives on the GMNF. Mechanical treatments include the use of chainsaws, brush saws, brush-hogs, or related equipment to remove or reduce specific vegetation from a site.

In addition to fuels reduction through mechanical and harvest treatments, fire provides an additional tool for mimicking natural processes and disturbance. There are different effects on resources when using fire versus timber management as a tool to achieve ecological objectives and fuels reduction. Fire contributes to a host of functions and processes in ecosystems. Fire reduces accumulations of organic material, which in turn reduces wildfire hazard. It recycles nutrients and alters soil chemistry, aids in decomposition, and influences soil structure and stability. Fire effects can vary depending on fire intensity, severity, and frequency, the primary factors that define fire regimes.

Monitoring Activities: Due to vacancies in Fire Management staff (2 Fire Management Officers), the Forest Service did not implement prescribed burns on the GMNF in FY06. This was in large part due to the lack of programmatic and operational oversight needed to manage a prescribed fire program.

The Forest Service did accomplish hazardous fuels reduction targets however, by treating approximately 96 acres (WUI) using mechanical methods by Force Account crews. This included: 60 acres (Rochester and Middlebury Ranger Districts (RD)), and 36 acres (Manchester RD). Fire Regime Condition Classes, both pre- and post-treatment observations were made. Post-treatment observations showed a move to a better condition class and all treatments were reported in National Fire Plan Operations and Reporting System (NFPORS).

Evaluation and Conclusions: The use of mechanical treatments to reduce hazardous fuels was effective in FY06. Fuel 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. These hazardous fuels treatments also provided secondary benefit objectives, which included ecosystem restoration and wildlife habit maintenance and improvement.

Recommendations: Due to the short window 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, the increase of hazardous fuels reduction using mechanical means is recommended. 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.

Although vertical arrangement and density were significantly altered by using mechanical treatments, accumulation of forest floor fuels increased with the treatments. Therefore, follow-up treatments should be designed, planned, and implemented to reduce forest floor fuel loads. This might include: prescribed fire use, biomass utilization, and piling with subsequent burning.

Evaluation Question #5:

How many agreements have been developed and maintained with outside partners?

Background: The Forest Service has had and continues to maintain strong partnerships with the Department of Defense (DOD). The Forest Service maintains agreements with the U.S. Army Environmental Center (State and Private Forestry) for Ft. Drum in New York, Westover Air Reserve Base (Air Force) in Massachusetts, and New Boston Air Force Station in New Hampshire. Although each has separate agreements, the scope of work remains fairly the same: To plan and implement prescribed burns for the reduction of hazardous fuels, and to provide fire training to DOD employees.

These partnerships and agreements are very beneficial to the Forest Service for a number of reasons. The DOD issues Military Interdepartmental Purchase Requests, providing supplemental funds to the GMNF's fire program. The implementation also is beneficial by providing good experience and training opportunities to fire personnel.

The Forest Service also maintains an agreement with the Northeast Forest Fire Protection Compact for interagency fire planning benefits. The Forest Service participates on an ongoing basis with a variety of working teams within the compact. In addition, a three-way Cooperative Fire agreement exists bewteen the State of Vermont, the U.S. Fish and Wildlife Service, and the Forest Service, providing numerous benefits relating to coordination and collaboration on fire preparedness and suppression.

The Forest Service also maintains numerous agreements and partnerships with Volunteer Fire Departments (VFDs) and a Mutual Aid Association. These agreements are beneficial by providing suppression support if needed on wildland fire incidents as well as aiding in the preparedness planning across the GMNF. The following table displays the VFDs under agreement with the Forest Service and the location on the GMNF which the agreement serves (North Half serves the Rochester and Middlebury Ranger Districts; South Half serves the Manchester Ranger District).

Location	Volunteer 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

Location	Volunteer Fire Department
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

Monitoring Activities: Management of the agreements is continuous and on-going requiring coordination with all parties within the agreement as well as with Forest Service grants and agreement specialists. With the exception of a few, most agreements are re-written every 5 years, with operating plans being done on an annual basis.

In FY06, the Forest provided hazardous fuels project planning and implementation for the DOD installations. The following table shows the number of acres treated at each facility under a cooperative Forest Service agreement and by what means.

District	Burn		Mechanical	
	#Units	Acres	#Units	Acres
U.S. Army, Ft. Drum, NY	5	1295	0	0
U.S. Air Force, New Boston, NH	1	38	0	0
U.S. Air Force, Westover, MA	5	228	0	0
Total:	**11**	**1561**	**0**	**0**

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

Recommendations: Desired partnerships with organizations (land trusts, clubs, private landowners, etc.) that provide opportunities to assist with on-forest and adjacent lands fuels management should be targeted. This might offer opportunities to reduce financial burdens on the Forest Service by offering more cost effective means to treat hazardous fuels and possibly increase the amount of acres treated per year.

Evaluation Question #6:

Have Heritage Resource sites within the Areas of Potential Effect (APE) of Forest Service-sponsored projects and management activities been protected and managed according to Forest Plan Standards and Guidelines?

Background: Over the past 20 years, historic archaeological sites have been protected through avoidance and "left alone." More recently, there has been proactive direction and attempts to enhance and preserve historic sites through hands-on vegetative management and stabilization activities.

Monitoring Activities: The Forest Service archaeologist monitored the results of a salvage timber harvest, implementation of design criteria related to stone walls in a timber sale, and the relocation of a snowmobile trail in order to determine whether the known sites in those APEs had been protected. Site locations were already known and documented, and monitoring consisted of observing whether activities (per the design criteria) indicated in the environmental review documents were implemented and effective, and whether the condition of the sites after project implementation were consistent with or better than the condition indicated on the site forms.

Evaluation and Conclusions: The straight forward approach to monitoring ("before/after" observation) was useful in determining the effectiveness of design criteria, and was a good feedback mechanism. The Forest Service is finding that attention to detail in working near Heritage Resource sites is critically important, and is more likely to apply when projects are small, or small components of larger projects are implemented as units. This allows better coordination between the implementers and the archaeological specialist. Specifically, the results of our monitoring showed that the small salvage sale and trail relocation had no effect on the nearby sites, while there was substantial miscommunication regarding the management activities near the stone walls in the timber sale. There was relatively minor damage to some walls under Forest Service jurisdiction, and some corrective action was taken, but

more importantly the monitoring highlighted the need to have better communication about desired end results.

Recommendations: Project-level monitoring should continue each year across the GMNF and across a variety of project types. Very specific expectations about the condition of sites and landscape features should be established in writing since general terms are subject to interpretation, and changes in personnel over the course of the project may make it necessary to document such expectations.

Evaluation Question #7:

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?

Background: The known Heritage Resources on the GMNF are primarily archaeological sites dating to the 19th century. More than 1,100 heritage sites have been recorded on the GMNF. A small (30) number of pre-European archaeological sites has been recorded; the small number of sites is largely due to the lack of intensive survey, not because these sites do not exist in larger numbers.

A new objective in the 2006 Forest Plan is to address the backlog of unevaluated heritage sites. Very few Forest Service heritage sites have been studied to evaluate whether or not they are eligible for the National Register of Historic Places. By doing such evaluations, the Forest Service will be better able to identify where to focus protection and preservation activities, and efforts to interpret significant sites for the public.

In addition to the new objective, the Forest Plan standards and guidelines for tribal relations and the treatment of human remains directs the Forest Service to formally consult with appropriate tribes, per the amended National Historic Preservation Act, and to adhere to the legal protocols established by the Native American Graves Protection and Repatriation Act (NAGPRA) in dealing with any human remains.

Monitoring Activities: The needs related to the Heritage Resource program management objectives were identified in the course of developing the 2006 Forest Plan, and had begun to be addressed incrementally in FY06. Some of the objectives were identified in the annual heritage program of work, and included in Forest Service Work Plans. These included work on a GIS-based prehistoric model, additional Section 110 activities, and continued work with Tribes. To date, 100 percent of National Forest System lands have been described by general overview studies, 14 percent of the land base has been surveyed in the field for historic period properties, and approximately 1 percent has received intensive survey such as digging test pits, for pre-European sites.

Evaluation and Conclusions: Progress was made on the program management objectives including:

- A Vermont-wide GIS model was worked on as part of a multi-partner task force
- Section 110 (“heritage outreach”) activities were numerous
- Contact with Tribes with vested interests on the GMNF continued

Recommendations: The Forest Service should continue with these activities and, as possible, address site evaluation, curation and historic building needs. The GMNF staff should increase the frequency of communications with Tribes.

Evaluation Question #8:

Have Heritage Resources across the GMNF been inventoried and protected?

Background: There are hundreds of historic period archaeological sites on the GMNF. An accurate and comprehensive inventory of these sites has not been completed, but progress is made annually in small increments. The associated monitoring of these sites' condition over time has been informal.

Monitoring Activities: Forest archaeologists conducted inventories within project areas. In addition, the condition of 50 archaeological sites was monitored across the Forest.

Evaluation and Conclusions: Comparing baseline site condition information (documented on Forest Service site forms) with the observed condition in the field, allowed GMNF staff to establish that a majority of sites on the Forest were in good (or at least unchanged) conditions. It was also identified that numerous sites would benefit from on-site vegetation management to mitigate the effects of encroaching vegetation.

Recommendations: The Forest Service should continue inventory and monitoring activities, and make the monitoring effort more formal and rigorous.

Evaluation Question #9:

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?

Background: There are three types of federal payments reaching municipalities that have U.S. Forest Service land: 1) Payments in Lieu of Taxes (PILT); and Public Law 106-393 – **Secure Rural Schools and Community Self-Determination Act of 2001**, comprised of the 2) 25-Percent and 3) Full Payment Funds. PILT funds are directed to towns, and the Public Law 106-393 funds (either the 25-Percent or the Full Payment Funds) are directed to school districts. See Appendix A for additional information on the federal payments and specific payment information for each GMNF town.

Monitoring Activities: Every December, the Forest Service sends an annual report to each town containing National Forest System (NFS) lands. The reports are specific to each town and specify the current acreage of NFS lands within the town boundary and the amount of money received from the PILT fund and Secure Schools fund. This information is used in "Town Reports" and is distributed at March town meetings. In addition, the Forest Service supplies town clerks with decade reviews of payments made to the town upon request or during scheduled visits.

Recommendations: Continue to provide PILT and Secure School fund information to town clerks.

Evaluation Question #10:

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

Background: The GMNF has worked with partners throughout its history to achieve social, economic, and ecological goals. Each year the GMNF continues relationships with existing cooperators and enters into new ones. This collaboration has resulted in increased public service and improved land stewardship, both which enhance the Forest Service's effort to meet desired conditions.

Monitoring Activities: In FY06 there were 46 partnerships on the GMNF, including:

- A Forest For Every Classroom
- Adopt-A-Salmon Program
- Antioch Graduate School
- The American Chestnut Foundation
- Appalachian Trail Conservancy
- Batten Kill Watershed Alliance
- Bennington County Conservation District
- Catamount Trail Association
- CRASC--Atlantic Salmon Restoration Program
- Green Mountain Club
- Hayes Foundation
- Keeping Track
- Long Term Ecosystem Monitoring Project
- Long Term Soil Monitoring
- Middlebury College
- Moosalamoo
- National Wildlife Federation
- The Nature Conservancy
- Otter Creek Basin Planning Committee
- Ruffed Grouse Society
- Student Conservation Association
- Town Forest Project
- Trout Unlimited
- University of Massachusetts--Wildlife Biology Department
- University of Vermont (UVM) Biology Department
- Upper Otter Creek Basin Partnership
- Urban Connections (Boston)
- U.S. Department of Labor—OSHA
- U.S. Fire Administration
- U.S. Fish & Wildlife Service
- U.S. Fish & Wildlife Service, Champlain Basin Program
- U.S. Fish & Wildlife Service, Cooperative Research Unit at UVM
- U.S. Forest Service Wildlife Research, Massachusetts
- U.S. Salmon Assessment Committee
- Vermont Association of Snow Travelers
- Vermont Coverts, LEAP
- Vermont Department of Environmental Conservation
- Vermont Department of Fish & Wildlife
- Vermont Envirothon
- Vermont Institute of Natural Science (VINS)
- Vermont Loon Project
- Vermont Monitoring Cooperative
- White River Partnership
- Wildlife Management Institute
- Yale University

Evaluation and Conclusions: The GMNF is maintaining active and effective relationships with partner organizations.

Recommendations: The Forest Service should continue to expand partnership opportunities where there is a mutual benefit to the partners and the Forest Service.

Evaluation Question #11:

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

Background: In FY05, seven properties were purchased which amounted to 303 acres. The Trust for Public Land assisted us in acquiring two of those properties. All of the lands acquired meet a multitude of Forest Plan guidelines for land adjustment, including consolidation of public ownership and enhanced recreation opportunities. Three of the properties will further conserve the watershed of the Batten Kill River, and one provided additional public and administrative access.

In FY06, eleven properties were purchased, totaling 3,392 acres. Again, many of the Forest Plan guidelines for landownership adjustment were met, including watershed, wildlife, and fish habitat conservation guidelines in addition to guidelines for providing for outdoor recreation and outstanding scenery. The 2,450 acre Broad Brook parcel encompasses almost the entire watershed of Broad Brook. The Trust for Public Land assisted in this purchase. The Conservation Fund assisted us with the purchase of a 16 acre critical wildlife corridor crossing area. A land exchanged also occurred, where 2.21 acres of land were exchanged for 10 acres adjacent to a popular hiking trail, and within the Moosalamoo National Recreation Area. Other properties acquired provide important black bear habitat and additional public access.

Monitoring Activities: Conservation partners, State and local colleagues, and interested citizens have provided tremendous assistance in identifying lands from willing sellers that would benefit the national forest system. Monitoring activities in the form of information sharing will continue to enhance the land adjustment program.

Evaluation and Conclusions: The partners who assisted us in FY05 and FY06 were invaluable in making four acquisitions occur. In concert with the Forest Service District Ranger and lands staff, the Trust for Public Land spearheaded an in-depth community relations effort to educate the residents of the town of Pownal on the benefits of purchasing the Broad Brook Property. Further, it was the Conservation Fund who identified and confirmed with both State and Forest Service Wildlife Biologists that a critical wildlife crossing area was in threat of development.

The information gained from these two partnership experiences highlights the importance of partnerships, community involvement, and feedback from biologists at both the State and the federal level.

Recommendations: Continue to work with partners, State entities, and communities to help identify, evaluate, and subsequently acquire properties for the land adjustment program.

Evaluation Question #12:

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?

Background: The GMNF has a great diversity of recreation facilities, however the Forest Service has a limited budget to operate and maintain all the sites. To address this, the GMNF has a number of partners that contribute to some portion of the maintenance however, this may not be sufficient to meet long-term needs. With a desire to provide high quality recreation, the Forest Service needs to monitor to determine if the management of recreation facilities is being maintained or improved. The recreation site monitoring employed on the GMNF began in FY99 as a result of Congressional direction regarding deferred maintenance reporting. We have completed some level of recreation site monitoring and data review since that time. During the first years of this process, the Forest Service was required to sample approximately 20% of the facilities in any given year.

Monitoring Activities: Deferred Maintenance Condition Surveys were completed by GMNF staff in FY06 using national protocols. The surveys were completed at a level sufficient to maintain GMNF data to national standards.

The monitoring is being done to respond to Forest Plan Goals and Objectives, including:

- Goal 12, Objective: Increase the number of developed recreation sites that are operated and maintained to standard.
- Goal 12: Objective: Reduce total deferred maintenance on GMNF developed recreation facilities.

Between FY99 and FY04, the Forest Service inventoried the condition of constructed features at 100% of the developed recreation sites including the costs required to repair or replace features that did not meet standard (deferred maintenance). Since FY04, the Forest Service has continued to revisit sites at least every 5 years to update the inventories. In FY06, the Forest Service completed condition inventories at 19 sites on the GMNF.

Evaluation and Conclusions: The protocols being used are consistent with national direction and provide the necessary information to answer this monitoring question. A more thorough evaluation of procedures and the status of the data will be completed for FY07. Changes in national standards may require adjustment in our monitoring procedures.

Recommendations: The Forest Service will continue to use existing protocols until adjustments to respond to changed national standards are needed. At this time, sample size appears to be adequate to maintain developed site data.

It is also recommended that the Forest Service complete an updated assessment of deferred maintenance for developed sites for FY07. This will serve as a baseline to determine trends in deferred maintenance.

Evaluation Question #13:

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)?

Background: In the FY04 Monitoring Report, the Forest Service described the lack of vista maintenance along the Appalachian Trail and Long Trail (AT/LT) that was evident with some vistas closing in from lack of management. The ability to view out from the AT/LT to the surrounding landscape is a positive attribute of the trail system that the Forest Service desires to maintain. Continued efforts to maintain vistas are needed to keep up with the growth of vegetation. Vistas that are naturally occurring, such as at rock outcrops, continue to provide opportunities to view scenery with little or no maintenance. Newly designated Wilderness areas on the GMNF have created a reduction in the number of vistas that can be maintained along the AT/LT since vista maintenance in Wilderness is not permitted. The results of the new Wilderness designations will include a reduction of vista locations over time as trees grow up to block views.

Monitoring Activities: The Forest Landscape Architect continues to monitor visual quality of the GMNF using visual quality objectives (VQOs) and the S&Gs set forth in the Forest Plan with the goal of maintaining or enhancing visual quality. In FY06, Forest Service monitoring emphasized review of the overall appearance of the GMNF and examined specific visual resource concerns for project planning and implementation. In addition, timber harvest designed in the Greendale EA was reviewed for visual quality after implementation.

Evaluation and Conclusions: Although the overall appearance of the Forest met the VQOs, visual enhancement of some vista sites would improve visual quality of the GMNF. Vista maintenance continues to be lacking as vegetation continues to grow up and block potential views. Design and mitigation measures developed for the Greendale EA were found to be adequate for meeting the VQOs.

Recommendations: In FY07/FY08, develop a database to improve organization of vista information. Continue to update the vista inventory, accounting for new Wilderness designation and the growth of vegetation in vistas located in Wilderness.

Evaluation Question #14:

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?

Background: The GMNF has been cooperating for the past 15 years with the Vermont Nongame and Natural Heritage Program (VNNHP), The Nature Conservancy (TNC), Vermont Department of Forests, Parks, and Recreation, and the Vermont Biodiversity Project, to identify and classify ecological types across the Forest and the state of Vermont. During that time, VNNHP and the GMNF had several Challenge-Cost-Share Agreements to identify high quality examples of natural communities within the Forest, which would then be evaluated for protection. Some of these natural communities are rare, and others are more widespread, but examples are in very good condition. During the late 1990s, VNNHP, TNC, the State of Vermont, and others worked together to classify natural communities in Vermont in a way consistent with the Forest Service's approach to ecological type classification. Around the same time, the Vermont Biodiversity Project identified landscapes and enduring features that are not currently conserved.

During development of the 2006 Forest Plan, the GMNF used all of this information and worked with TNC, the State of Vermont, and the University of Vermont to identify a classification of ecological types that could represent types of natural communities and enduring features that should be represented in a conserved network, what we called the "reference area network". This network provides a laboratory for studying the most exemplary communities on the Forest today, their recovery from the history of land use in the Green Mountains, and changes over time as a result of climate change, acid rain, and other disturbances brought on by nature. We then assigned the best examples of these ecological types and natural communities to management areas through which they would be most effectively conserved. Some examples were already conserved in Wilderness or Special Area designations, while others were placed under more restrictive designations than they were under the 1987 Forest Plan. Several examples that occur along the western edge of the GMNF known as the "Escarpment" were placed in the Escarpment Management Area, which allows disturbances like tree cutting and burning needed to maintain these communities. In the 2006 Forest Plan, at least 14% of the currently recognized ecological types and landscapes within the GMNF are represented within the reference area network (FEIS, Table 3.11-6, Alternative D, p. 3-252 to 3-253). See Appendix B for a list of rare or uncommon natural communities.

As the GMNF continues to update and revised its classification of ecological types, and continues to evaluate these types in the field for high quality conditions, we will update our records for representation and ensure that at least 5% of these ecological types and landscapes are represented in the reference area network or other appropriate designations. The primary emphasis of monitoring during plan implementation will therefore be maintaining these rare and outstanding natural areas at

their current level of quality or higher. This may mean controlling incursions of non-native invasive species and ATVs, and it could mean using prescribed fire to maintain a natural disturbance regime. Monitoring will occur before and after activities to determine if actions contributed to or detracted from composition, structure, and function of the sites in relation to their values.

Monitoring Activities: During FY06, the Cape RNA was evaluated for a potential research project by the Northern Research Station, and no major management concerns or issues were identified at that time. The researchers noted an abundance of yellow jewelweed in the area, out of proportion to what had been observed there in the past. This may be the result of new rock slides, or due to increased light from eastern tent caterpillar browsing of the canopy leaves. We plan to monitor this over the next couple of years to observe any additional changes in composition and structure.

Also during FY06, Wilderness Rangers visited and monitored several sites within Breadloaf, Bristol Cliffs, Big Branch, Peru Peak, and Lye Brook Wildernesses. Specifically, Gilmore Pond, Bourn Pond, Lost Pond Bog, Skylight Pond, and Big Mud Pond are popular camping areas within Wilderness and some like Bourn Pond get frequent visitors. Wilderness Rangers clean up trash and camping debris and return the sites to a relatively natural condition. Rangers noted that at Big Mud Pond and Lost Pond Bog no new user-created trails or tree cutting had occurred. Rangers also checked these areas for non-native invasive species (NNIS), and none were noted at any of these sites. Griffith Lake was visited by the Rangers and common buckthorn, an NNIS plant, was noted on the lake shore and was removed. Rangers visited Breadloaf Mountain, Bristol Cliffs, and the Winhall River area of Lye Brook, and no reports of ATV use or NNIS were noted for these areas.

Evaluation and Conclusions: During development of the 2006 Forest Plan, the Forest Service completed the evaluation of rare and exemplary natural communities, and derived conclusions regarding these sites and the extent to which they represented the breadth of ecological diversity on the GMNF. As a result of this process, we placed these sites under management direction most appropriate for their conservation, and we developed protocols and indicators for their monitoring and evaluation. Once monitoring and evaluation protocols for these sites are implemented in FY07, we will gather data and evaluate the condition of these sites either every 5 years where conditions are stable, or at a shorter interval where conditions are changing or where management issues have arisen. Currently, there are no major management issues or concerns identified for these sites except for the common buckthorn at Griffith Lake; since Rangers visit that site regularly regular monitoring should determine if a new population becomes established.

Recommendations: In FY07, the GMNF plans to implement the monitoring strategy for rare and exemplary natural communities as envisioned in the Monitoring Guide. If the program is fully funded, we hope to monitor 12 sites on the GMNF in FY07.

Evaluation Question #15:

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?

Background: The Forest Service currently issues permits for gathering of the following special forest products on the GMNF: maple sap, Christmas trees, boughs, saplings, seedlings, dead/down wood, miscellaneous sawtimber/pulp, and firewood. The agency evaluated this level of gathering for the development of the Forest Plan, and found it to be ecologically sustainable, but little was known about gathering of other desirable products for which permits are not ordinarily issued. During Forest Plan development, Marla Emery of the Northern Research Station (NRS) in Burlington drafted a proposal to assess the uses of special forest products in and around the GMNF, which the agency did not implement at that time. We believe that this assessment would still be a valuable tool to help the

agency identify which species require permits and what permit rules should apply. This will lead to greater certainty both within the Forest Service, and among the public, regarding which products can be collected sustainably, in what locations, and what type of permit or restrictions apply.

Monitoring Activities: Currently, the GMNF monitors the quantity and type of SFPs for which permits were issued for gathering, as well as those for which permits were denied. In addition, the 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 FY06, permits were issued for the following products:

Product	Quantity
Maple sap	1120 taps
Firewood	257 cords
Dead/down wood	0
Christmas trees	112 trees
Boughs	3 tons
Seedlings	0
Saplings	0
Miscellaneous	0
Botanical samples (fungi)	200 lbs

During FY06, NRS visited five maple sap permit areas to evaluate the effects of a major forest tent caterpillar outbreak in Vermont and New England. They recommended that sugaring in one of the permit areas be suspended for the spring of 2007 due to the impacts of this insect on the health of the maples. This same permit area was also suspended during the spring of 2006 due to the same health issue. In addition, we monitored maple sap permit areas during the sugaring season in 2006, and discussed compliance issues with two of the permittees. No areas were shut down due to compliance issues.

Evaluation and Conclusions: The types and amount of products gathered did not appear to vary substantially from previous years, although firewood gathered was greater than the average of the past several years. Gathering continues at a low level, and requests for SFP permits beyond the usual kind are rare, happening about once a year. For example, in FY06 we issued a permit for collection of small samples of plant matter from the ground for evaluation of fungi. Regular monitoring of sugarbushes, both for maple health and for permit compliance, have proven useful for alerting managers to problems, which are quickly resolved. An assessment of SFP uses across the Forest is still desirable, and was built into the Monitoring Guide, which will be published in FY07. Otherwise, current methods and data collected appear to provide an effective measure of SFP use and sustainability for those products requiring permits.

Recommendations: The Monitoring Guide identifies the need to implement the assessment proposed by Marla Emery of NRS to assess SFP use across the Forest. We hope to work with NRS in FY07 to refine the project plan, and then implement the assessment sometime in the following 2-3 years.

Evaluation Question #16:

How many acres are being treated with varying management actions to maintain and increase upland opening habitats?

Background: The GMNF opening maintenance program relies on a combination of "tools" (e.g. prescribed fire, commercial timber sales, contract mowing and cutting) and adequate funding support. For FY06, this combination resulted in the enhancement and/or maintenance 788 acres of existing openings. Reflecting on the Forest Plan goal of 3-5% non-forested acreage (on lands where vegetative management is prescribed), we can expect at best to meet the low end of this Forest-wide goal.

With an adequate prescribed burning window in the spring of each year, adequate funding to advertise contracts, and an active forest management program, the Forest Service can potentially maintain and enhance existing openings and potentially create more manageable openings to replace those that currently exceed management capabilities. In years with a short, or poor, burning period, the Forest Service will need to rely on partners, volunteers, and budgetary support to accomplish this same level of maintenance through the more expensive methods of mowing and cutting.

Monitoring Activities: In 2006, the GMNF monitored over 1,000 acres of openings, with the purpose of identifying: those stands with rare or unique habitats or species; those stands with advanced regeneration, therefore requiring a greater level of management or a more aggressive tool and; those stands with an opportunity to expand, or encompass a number of smaller stands therefore increasing the efficiency of our maintenance program and the availability of the habitat to a more diverse cadre of early successional species.

Evaluation and Conclusions: Forest Service monitoring and evaluation of openings on the GMNF has been an ongoing process. Openings are not generally a natural part of the forest environment and therefore are quick to revert back to a more natural forested state. Existing protocols include a general review of openings to identify potential opportunities to reduce the expense, and increase the productivity of each opening as well as public participation in the maintenance of these sites.

Each opening we evaluate in this way gives the forest additional information to use in the establishment of partnerships and opportunities to increase our effective and sound management of this forest resource.

Recommendations: Continue to survey and monitor sites for these early successional forest birds as well as other early successional species, increasing 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 #17:

How many acres are being treated with varying management actions to maintain and increase aspen-birch and regenerating forest?

Background: The Forest Service biological team identifies needs and opportunities related to wildlife habitat conditions and trends for every GMNF project proposal. The opportunities are consistent with on-the-ground review of project areas and management area direction for habitat diversity. Each project is unique and consultation with other federal, State, and local entities is used to inform and structure locally desirable needs and opportunities.

Monitoring Activities: Monitoring would be completed after a period of time and would evaluate the number of acres proposed for treatment and the number of acres actually treated.

Evaluation and Conclusions: Data and information is not yet available to evaluate.

Recommendations: Continue to participate in the development of project level habitat management planning and evaluation. Incorporate public input and participation with the goal of developing acceptable actions to maintain these unique habitats.

Evaluation Question #18:

To what extent has staff been in the field monitoring wilderness boundaries and providing public education and outreach?

Background: Leave No Trace (LNT) and Wilderness information/education are taught as much as possible to help people understand and care for Wilderness. Wilderness Ranger field presence in high use and remote areas continues to be the highest priority. The number of Leave No Trace contacts, presentations, and trainings are monitored, with an emphasis on providing educational outreach on weekends and holidays during the summer and fall when the highest numbers of visitors are recorded.

High priority boundaries (boundaries that abut private lands, power lines, etc.) are often checked for non-conforming activities such as motor vehicle encroachment and unauthorized trail cutting. Known problem areas are checked on a more frequent basis than those in remote areas, or which abut other Forest Service lands.

Monitoring Activities: In FY06, the GMNF Wilderness program was composed of two full time staff, two seasonal employees, one Student Conservation Association (SCA) intern, and a Student Career Experience Program (SCEP) student. Each of these staff members was trained in speaking to visitors about the public purposes of Wilderness as well as Leave No Trace practices.

- Wilderness staff completed a comprehensive Wilderness Education Plan
- Field staff made approximately 209 LNT contacts with the public, frontline office staff recorded 222 LNT contacts, and one LNT Trainer's course was provided to four GMNF employees.
- Staff presented four Wilderness Awareness talks at Vermont colleges/universities
- Field staff spent 21 days on overnight trips to high use areas disseminating information
- 26 miles of wilderness boundaries were checked in FY06.

Evaluation and Conclusions: Staff spent a proportionate amount of time providing public education and outreach/boundary monitoring with their additional duties of trail brushing/clearing, non-native invasive species (NNIS) surveys, campsite monitoring, etc. The program is very effective in providing this information to the publics that have a basic understanding of congressionally designated wilderness (and ask for more information); however, we have the opportunity to expand this to the Forest's communities that abut these special places.

Recommendations: Annually update the Wilderness Education Plan utilizing feedback received from presentation evaluations. Continue to find new audiences (other than college students) to present this information to. Continued uniformed field presence and level of LNT training for field staff should receive high priority. Continue to monitor wilderness boundaries and work with Law Enforcement to correct issues as they arise.

Evaluation Question #19:

How many wilderness areas are managed to national standards?

Background: During the 40th anniversary of the Wilderness Act, the Chief of the Forest Service created the 10 Year Wilderness Stewardship Challenge (10 YWSC) 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 FY06, GMNF Wilderness staff concentrated on managing Lye Brook and Big Branch Wilderness areas to national standards and has made great strides in accomplishing the goals of the Chief's 10 YWSC within these areas. The addition of the management direction in the recently completed Forest Plan has given Forest Service staff tools to use in the future stewardship of the wilderness resource (e.g., Wildland Fire Use).

The following activities were completed in FY06, specific to Lye Brook and Big Branch Wilderness areas (based on elements of the 10 YWSC):

- Element 2 - An invasive species plan was written for Lye Brook and Big Branch Wilderness areas in CY 2005 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 methods have been taken. The sites treated in 2005 have been monitored in 2006 and have been successful. New sites identified/treated in 2006 will continue to be monitored for success. All occurrences of NNIS are reported to the Forest Botanist/NNIS Coordinator who reports this data in using national protocols. All wilderness staff received annual training in the identification/treatment of NNIS.
- Element 3 - Per discussions with Region 9 Air Specialist Ann Acheson, it was determined that there is enough data to include all south half (George D. Aiken, Lye Brook, Peru Peak, and Big Branch) Wilderness' in the 10 point category for Element #3. This is based on long-term monitoring being done in and around Lye Brook because all Wilderness Areas on the south half of the Forest share a similar proximity, geology, physiograhy, vegetation, and climate (documentation dated 9/12/2006 available upon request).
- Element 4 - A Wilderness Education Plan for all GMNF Wilderness areas was completed and fully implemented in FY '06. Wilderness staff provided wilderness stewardship presentations at three Vermont colleges, one Leave No Trace Trainer's Course, and numerous LNT/awareness public contacts in the field. Evaluation of the plan is on-going and modifications occur annually.
- Element 6 - A recreation site inventory was completed in FY '05 and exceeds the minimum requirements of the established protocol (Cole). All campsites have been entered into Infra-Wild. In FY '06, Wilderness staff created a GIS database using the inventory points to visually display impact data. A total of 48 campsites were recorded in Lye Brook and 34 in Big Branch.
- Element 10 - The total number of FTE's days in NFRW for FY '06 was 522. It is estimated that Wilderness staff spend approximately 25% of their time focused on Lye Brook Wilderness, or approximately 130.5 days (522 * .25). 130.5 days was divided by total days allocated per year

(130.5/260), which is .5. This number of FTE's who worked on tasks for Lye Brook Wilderness is divided by the target Workforce (.5/.87= 57%). The GMNF currently meets 57% of the baseline workforce. The total number of FTE's days in NFRW for FY '06 was 522. It is estimated that Wilderness staff spend approximately 25% of their time focused on Big Branch Wilderness, or approximately 130.5 days (522 * .25). 130.5 days was divided by total days allocated per year (130.5/260), which is .5. This number of FTE's who worked on tasks for Big Branch Wilderness is divided by the target Workforce (.5/.79= 63%). The GMNF currently meets 63% of the baseline workforce.

Evaluation and Conclusions: The Chief's 10 YWSC has provided wilderness staff with an excellent tool to determine how well the Forest Service is doing in managing the resource. The data collected in FY05 and FY06 will serve as a baseline for future Monitoring and Evaluation reports.

Recommendations: Establish partnerships to enable further data collection, particularly elements two and six. Continue to utilize established protocols for data collection.

4. Forest Plan Standards and Guidelines

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

Monitoring Driver: Forest Plan Standards and Guidelines

Evaluation Question #1:

Are culvert rehabilitation projects resulting in improved fish passage at road crossings? Are road construction and maintenance activities resulting in improved or replaced culverts designed to handle water flows and debris, and allow free movement of resident aquatic life?

Background: Since 1995, the Forest Service has conducted road crossing/stream culvert surveys to identify migration barriers to fish and other aquatic organisms. To date, approximately 154 culverts have been surveyed forest-wide. Of this total, about 30 culverts are passable by native fish species, 98 are impassable, and 24 have not been analyzed yet. Criteria used in this evaluation process were developed from available scientific literature. The Forest Service is also working with the Vermont Departments of Fish and Wildlife and Environmental Conservation, U.S. Fish and Wildlife Service, and other organizations such as the White River Partnership and Batten Kill Watershed Alliance to improve passage for fish and other aquatic organisms in several Vermont watersheds. In 2003, the Forest Service began a program to rehabilitate culverts that were seasonal or marginal barriers to fish migration. To date, three culverts have been enhanced to provide passage in Bingo, Brandon, and Hale Brooks, and four others are in various stages of planning.

Monitoring Activities: In 2006, 54 culverts were surveyed for fish and aquatic organism passage. In addition, GMNF fisheries staff provided assistance to the Batten Kill Watershed Alliance and its partners for replacing a culvert that was a barrier to fish passage in the Batten Kill watershed.

Evaluation and Conclusions: Data from the 2006 culvert surveys were not analyzed but will be in the future along with additional data from past years. A comprehensive analysis will be completed approximately every five years.

Recommendations: Continue culvert surveys and monitoring activities in FY07.

Evaluation Question #2:

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 Activities: This question will be addressed in a comprehensive analysis in the FY2007 report.

Evaluation Question #3:

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?

Background: Standards and guidelines are designed to achieve the desired conditions, goals, and objectives stated in the 2006 Forest Plan. They are usually mitigation measures that minimize or negate the effects of a management action or land use.

Standards are Forest Plan management requirements that are applicable to all foreseeable situations. Standards are mandatory permissions, limitations, desirable conditions, or in some instances required courses of action needed to achieve the goals and objectives of the Plan. Standards can be forest-wide or management-area specific. Deviation from standards requires an amendment to the 2006 Forest Plan.

Guidelines are Forest Plan management requirements that are applicable to most situations but can be modified at the project level. To communicate discretionary guidance, guidelines are permissions, limitations, desirable conditions, or courses of action that should be implemented in most situations. Deviation from a guideline does not require a Forest Plan amendment, but it does require that the rationale for deviation be disclosed in the project decision documents and analysis.

As stated in the Forest Service Manual (FSM 1926.52), when a significant change needs to be made to a Forest Plan, the Forest Service unit Supervisor must prepare an amendment. The following examples “indicate circumstances that may cause a significant change to a land management plan:

- Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected…
- Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.”

Monitoring Activities: No Forest Plan amendments were recommended or signed in FY06.

Recommendations: Continue to monitor deviations from guidelines and the potential need for Plan amendments.

5. Forest Plan Management Area Guidance

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

Monitoring Driver: Forest Plan Management Area Guidance

Evaluation Question #1:
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?

Background: Throughout the 20th century, fire management policy has continued to evolve in response to land and resource management needs, growing knowledge of the natural role of fire, and increased effectiveness of fire suppression. During the earliest years of wildland fire management (i.e. 1940s), the existing state of knowledge indicated that aggressive, total suppression was the best solution to limit widespread, damaging fires. As knowledge, understanding, and experience expanded, it became apparent that complete fire exclusion was not the best management direction to support a balanced resource management program. Fires can be managed for resource benefits through the use of management-ignited prescribed fire. On the GMNF, prescribed fire can be used to meet particular objectives in management areas that allow its use. Some of these objectives include:

- Reduce hazardous fuel loading in the Wildland Urban Interface to reduce the risk of intense wildfire
- Create, maintain, or improve wildlife habitat
- Prepare sites for restoration of species such as oak, pine, and aspen
- Create, maintain or improve plant community composition by influencing the scale and pattern of vegetation across the landscape including changing successional patterns while maintaining ecological functions and processes
- Control interactions between plant communities and insects and/or disease
- Promote blueberry production
- Create or maintain scenic vistas

The use of prescribed fire is an integral component of the GMNF fuels treatment program which started in earnest during the mid-1970s to achieve multiple vegetative management objectives. The program consists of both mechanical as well as prescribed fire activities. Mechanical treatment includes the use of chainsaws, brush saws, brush-hogs or related equipment to remove or reduce specific vegetation from a site. The use of prescribed fire will almost always accomplish multiple objectives within the same treatment area or unit. For example, a prescribed burn to maintain wildlife habitat may also reduce fuel loadings. An understory burn to promote fire adapted oak may also benefit individual fire adapted ground flora.

Management Area specifically addresses the need for prescribed fire use to attain ecological objectives with this guideline: “Prescribed fire in association with mechanical means, including timber harvesting, should be used for regenerating oak and pine dominated natural communities, and when maintaining or establishing fire-dependent species.”

Monitoring Activities: Due to vacancies in Fire Management staff (2 Fire management Officers), the Forest Service did not implement prescribed burns on the GMNF in FY06. This was in large part to the lack of programmatic and operational oversight needed to manage a prescribed fire program.

Prescribed fire planning was accomplished however, with over 30 prescribed burn plans being shelf stocked for use in FY07. Each prescribed fire plan based parameters on pre-burn observations of the site. There are two main objectives associated with every plan, one objective focused on broad resource results, and the other targeting specific objectives resulting to the fuels from the prescribed fire. In general, the resource objectives were: 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. On a site specific level, the majority of the burn plans had prescribed fire objectives (and acceptable range of results) to reduce the 1hour fuels by 75% and 10 hour fuels by 50%.

Evaluation and Conclusions: Prescribed fire was not used as a management tool in FY06, therefore evaluations or conclusions cannot be made.

Recommendations: Prescribed fire on the GMNF will continue to be a vital tool for the reduction of hazardous fuels, to maintain wildlife habitat, timber stand improvements, and restore and enhance ecosystems. Therefore, the use of prescribed fire should be an ongoing management practice in the future.

Evaluation Question #2:

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 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?

Background: Wildland fire use (WFU) consists of the management of naturally ignited fire to achieve predetermined vegetative management objectives. The GMNF has not utilized this tool and has instead suppressed all wildland fires. The main objectives of using WFU includes restoring fire to its natural role in the ecosystem, such as allowing natural ignitions to burn without suppression in Wilderness, as well as to maintain the viability of fire-adapted vegetation communities, such as oak. Objectives are accomplished in a manner that remains consistent with the safety of people, property, and other resources

Monitoring Activities: Wildland Fire Use, although approved in the Forest Plan, was not yet added into the 2006 Fire Management Plan as a viable option; therefore, no fires were managed as WFU fires in FY06. During FY06, WFU drafts were being written for implementation in FY07.

Evaluation and Conclusions: There is nothing to report as no WFU fires occurred in FY06.

Recommendations: The management of Wildland Fire Use fires was not an option in FY06, however the 2007 Fire Management Plan does allow for its use. Although natural ignitions are rare, the Forest Service should continue preparing for WFU opportunities by Fire Management and Agency Administrator training, 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 resulting WFU.

Evaluation Question #3:

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 form the desired future condition of the management area?

Background: The 2006 Forest Plan allocates land to different management areas (MAs), each with a unique desired future condition, major emphasis, and management direction. This monitoring item incorporates a comprehensive review of activities in the MAs and the activities' effects on working towards the desired future condition of each MA.

Monitoring Activities: This question will be addressed in a comprehensive analysis in the FY07 report.

Evaluation Question #4:

Are Wilderness Study Areas being managed to maintain roadless characteristics?

Background: A total of 27,473 acres (7%) of National Forest System Lands were allocated as Wilderness Study Area in the 2006 Forest Plan.

Monitoring Activities: Twenty-one separate NEPA documents were signed during FY06 on the GMNF and all were analyzed concerning their impacts to the roadless characteristics of these areas.

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 Wilderness Study Areas on the GMNF.

Recommendations: Continue to utilize management direction to analyze the effects of individual projects and activities within the Wilderness Study Area MAs.

Evaluation Question #5:

How are soil/site quality and productivity changing over the long term, in response to factors such as acid deposition, climate change, invasive species, other environmental problems, and forest management? More specifically: A) Are soil nutrient levels changing, and are the changes affecting soil/site productivity? B) What toxins exist in the soil (e.g. from the atmosphere), and how are they changing in quantity and type over time? Is this affecting productivity? C) Are forest management activities affecting soil/site productivity?

A member of the Long-term Ecosystem Monitoring Project Team looks for plot locations in White Rocks National Recreation Area.

Background: Two projects were initiated in 2000-2001 to address questions A and B:

- A long-term soil climate change monitoring site was established near Lye Brook Wilderness through efforts of the Vermont Monitoring Cooperative (VMC) and several partners. This site is part of the nation-wide Soil Climate Analysis Network (SCAN) operated by the Natural Resource Conservation Service.
- Two long-term soil monitoring plots were established in Lye Brook Wilderness in 2001. These plots are part of the VMC 200-year Long-term Soil Monitoring Project, which will track trends in soil nutrient levels, toxins in the soil, and tree health over time, and will provide insight into changes in soil quality and productivity in response to atmospheric deposition. Initial sampling was completed in 2002. Plots are located in areas where tree harvesting will not take place.

Question B is addressed annually through implementation and effectiveness monitoring of Forest Plan Standards and Guidelines (S&Gs) and State of Vermont Acceptable Management Practices (AMPs). In addition, some soil compaction monitoring was also done. Monitoring is focused primarily in harvest areas.

Monitoring Activities:

Monitoring to address Questions A and B –

- In 2006, the Forest Service began work to establish a network of 20-40 Long-term Ecosystem Monitoring Plots (LEMP) on the GMNF. These plots will be similar in purpose to the VMC project, but will greatly expand the plot network on the Forest. Changes to the vegetative community, tree health, and soil quality will be monitored in response to environmental changes such as climate change and levels of atmospheric deposition. Complimentary research projects will be encouraged. In 2006, a Cooperators Group assisted the Forest Service in planning and implementing the study. Cooperators included the State of Vermont – Department of Forests, Parks and Recreation, Natural Resource Conservation Service, VMC, and the Forest Service Northern Research Station. Plot location will begin in 2007, with initial plot sampling starting in 2008.
- In 2006, plans began for the 5th-year sampling at the VMC Long-term Soil Monitoring plots. Soil sampling will happen in 2007.

Monitoring to address Question C –

Implementation and effectiveness monitoring was done at the North Half Overstory Removal and Holt Mountain Sales. Forest Service monitoring is based on the following:

- No harvesting is conducted on low-productivity sites, for example where soils are less than 20-25" deep.
- Harvesting is primarily bole-only, rather than whole tree. Clearcuts are much less frequent than partial cuts. We harvest using long-rotations. These management actions help to keep soil nutrient on-site.
- Harvested areas consistently regenerate vigorously, indicating that site productivity appears to be maintained.
- Soil productivity is maintained if S&Gs, AMPs, and mitigation measures from the Environmental Assessment are generally implemented and effective. This is supported by research studies in New England. The only exception to this is we recognize soil productivity has and cannot be maintained on the system of roads, skid roads, and landings needed to access harvest areas.

A well vegetated skid road in Unit 9 of the North Half Overstory Removal Sale, Middlebury District.

Evaluation and Conclusions:

Monitoring to address Questions A and B –

The NRCS produced a report summarizing the first five years of data collected at the SCAN site. This report is available from our Supervisor's Office. The initial five years of monitoring provided baseline data for the Lye Brook site. A few highlights of the report are:

- Very few soil temperature readings below 0 degrees Celsius were recorded, raising the question of whether the soils actually freeze in winter.
- In summer, the upper layers of soil are the warmest, but in winter the deeper layers are warmest.
- Soil temperature variation at 40 inches below the ground surface is minimal, year-round.

It is too early to detect trends in soil climate change, however once a long-term record is established, it will be extremely valuable in understanding our future climate.

LEMP monitoring results will not be available for approximately 5 years. Monitoring results for the VMC Project will be available to the public when analyses are complete.

Monitoring to address Question C –

Overall, S&Gs, AMPs, and mitigation measures were implemented and effective on the Overstory Removal (Units 5, 6, 8, 9, 11), Holt Mountain (Units 1, 2, 3, 5), and Greendale (Units 2, 5, 13, 14) Sales. Soil productivity appears to be maintained as identified thorough monitoring in the summer of 2006. Soil erosion and stream sedimentation were minor and riparian areas were protected. Soil compaction was confined to landings and skid roads and skid road rutting was of minor extent in all harvest units except Units 9 and 11 of the Overstory Removal Sale. Subsequent monitoring in these two units showed that some ruts were smoothed prior to unit closure and that rutting did not cause stream sedimentation. All skid roads were water barred to control erosion and were revegetating well.

Recommendations: Continue all monitoring efforts.

6. Transportation System: Off-Road Vehicle Use

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

Evaluation Question #1:

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

Background: There is a long standing concern about the illegal use of motor vehicles on the GMNF, as documented in both the 1987 and the 2006 Forest Plans. In addition, illegal use of vehicles off roads is a national issue that prompted a change in policy and direction regarding wheeled motorized vehicles. Though an important 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. The Forest Service decided to utilize existing protocols implemented by law enforcement personnel as the starting point for monitoring of this activity.

Monitoring Activities: In FY06, monitoring continued in conjunction with routine law enforcement patrols. As patrols document incidents or the issuance of notices of violation, the records are recorded and entered into a database. Data is entered and stored in the Law Enforcement and Investigation Management Attainment and Reporting System (LEIMARS). Retrieved data can be used to show trends, however there are limitations to data evaluation given the data dependency on personnel availability.

The Forest Service is monitoring this item to assist in determining if the use of vehicles off roads is causing considerable adverse effects on resources or other forest visitors and to assess how effective forest management practices are in managing vehicle use off roads. This type of monitoring is also a regulatory requirement (36 CFR 295). Though there are concerns about snowmobiles, the main focus for this monitoring item is wheeled motorized vehicles.

Evaluation and Conclusions: Data displayed in the following table shows the results of monitoring over the last three fiscal years. The data can be used to identify initial trends and provide baseline data that can be supplemented in the coming years following extended periods of Forest Plan implementation. Data are separated into Incidents (includes warnings or visual identification of a violation) and Notices of Violation where somebody receives a citation for the infraction. Currently data for wheeled motorized vehicles and snowmobiles is combined under an off highway vehicle category. Three year data for the GMNF shows:

Fiscal Year	Incidents	Notices of Violation	Total
FY 2004	196	33	229
FY 2005	253	40	293
FY06	259	21	280

The data shows an increasing trend in this three year period which is consistent with various reports from the public. The data in any given year is dependant on availability of law enforcement personnel so short term trends need to be considered accordingly. Two consecutive years of higher data would indicate a probable increase in illegal use but further monitoring should occur in FY07 to expand on this information.

Recommendations: Though it is desirable to utilize the existing protocol for data collection since it is an existing national data system, it is recognized that additional work is needed to develop new protocols to expand on this information. The Forest Service should work with law enforcement to determine if a method can be developed to separate data for wheeled motorized vehicles from snowmobiles. Ideally this could be achieved without labor intensive review of documentation.

In addition, the Forest Service should continue to search for protocols that can measure the effects of this use on both the physical and social resource. New monitoring will need to be cost effective and would hopefully use an existing monitoring system or be conducted with ongoing planning for implementation of the LRMP.

7. Vegetation

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

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

Evaluation Question #1:
Are lands adequately restocked according to stocking surveys?

Background: The National Forest Management Act (NFMA) of 1976 provided requirements that all stand regeneration harvest activities on suitable timberlands that create forest openings be quickly reforested. For the GMNF, this requires that any harvest activity effectively beginning stand-origination is reforested within 5 years of the harvest event that creates the opening. This monitoring item helps to determine if we are meeting the requirements of NFMA.

Monitoring Activities: One created opening was completed on the Patterson Brook timber sale in 2006, triggering the requirement for plantation establishment to begin. Field review of this 29 acre clearcut in 2006 indicated that planting was to begin in 2007. The call for plantation establishment requires that seed is collected and sown and seedlings are produced in a nursery, to be planted on site once grown. As stand regeneration harvests on the GMNF have occurred with less frequency than planned amounts found in the Forest Plan implementation schedule, there are no other created openings to report from 2006.

However, 96 acres of site preparation for natural regeneration occurred on the GMNF in FY06 (Peabody Hill and Patterson Brook timber sales), beginning the reforestation period. Monitoring of an additional 85 acres of stocking surveys was completed in FY06, with 19 acres of first year surveys (Holt Mountain timber sale) and 66 acres of third year growth and survival surveys completed (Otter Creek, Utley Brook, and Gillespie timber sales; source: FACTS database).

Evaluation and Conclusions: Reforestation monitoring is an integral part of national forest management operations and has standardized requirements. 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 in years one, three, and five (if needed) following the planting effort. Successful reforestation is assured when plantations are certified as "free to grow" by year five. Stocking surveys completed in FY06 indicate that reforestation efforts underway are sufficient to meet stocking certification for all units within the required timeframes. An evaluation is scheduled to begin for the Patterson Brook clearcut harvest and plantation establishment in 2007, with first year findings to be provided in the FY07 Annual Report.

Recommendations: This monitoring item is on track. 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 undertaken and achieved on all units of regeneration harvesting.

8. Native and Desired Non-Native Species

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

Evaluation Question #1:

What are the population trends for sensitive plants on the GMNF? To what extent is management sustaining or enhancing habitat conditions for populations?

Background: Sensitive plant species tracked by the GMNF 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 the GMNF classifies as Regional Forester Sensitive Species or RFSS plants. VNNHP has a national database that records information about populations they track, which includes most of the plants considered RFSS on the GMNF. The database includes population data such as numbers of plants, their condition, flowering/fruiting, any management concerns or issues, and a general rank of the occurrence from A (excellent estimated viability) to D (poor estimated viability). 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 and NEPCoP have been working with local National Forests to develop conservation plans and assessments for species of concern. 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: During FY06, the primary emphasis of the rare plant program on the GMNF was to update the RFSS list for the Forest based on information gathered during evaluation of species viability during development of the 2006 Forest Plan. Several plant species were added to the list as new occurrences or because they are of increased viability concern on the GMNF. The final list includes 71 plant species, compared to 65 in the list last updated in 2004. The 2006 updated list is included as an Appendix to this document. Plant species added to the list include: *Asclepias exaltata* (poke milkweed), *Carex backii* (rocky mountain sedge), *Carex haydenii* (cloud sedge), *Ceratophyllum echinatum* (prickly hornwort), *Cynoglossum virginianum* var*. boreale* (northern wild comfrey), *Diplazium pycnocarpon* (glade fern), *Eleocharis ovata* (ovate spike-rush), *Equisetum pratense* (meadow horsetail), *Hackelia deflexa* var*. americana* (northern stickseed), *Helianthus strumosus* (harsh sunflower), *Pyrola minor* (lesser wintergreen), *Quercus muehlenbergii* (chinkapin oak), *Solidago patula* (roundleaf goldenrod) and *Stellaria alsine* (bog chickweed).. Other species were removed from the list because we determined their viability to be less of a concern, or they had been incorrectly identified on the GMNF, including *Carex atlantica* (prickly bog sedge), *Isoetes tuckermanii* (Tuckerman's quillwort), *Myriophyllum humile* (low water-milfoil)*, Ribes triste* (swamp red currant), *Sorbus decora* (northern mountain-ash), *Sparganium fluctuans* (floating bur-reed)*, Torreyochloa pallida (=Puccinellia fernaldii)* var. *fernaldii* (Fernald's manna grass)*,* and *Utricularia geminiscapa* (hidden-fruited bladderwort).

In addition, Forest Service staff monitored one population of *Polemonium vanbruntiae* (Appalachian Jacob's ladder), and contracted with a local botanist to monitor nine populations of *Panax quinquefolius* (ginseng). *Polemonium* was monitored at the end of the growing season to provide baseline data for an administrative study of the effects of increased light on plant density and vigor. *Panax* was monitored during the growing season to determine whether previously documented populations were still extant, to note any threats (e.g. collection, herbivory, non-native invasive plants) to population viability, and to mark population locations using GPS. Monitoring was consistent with the Vermont Nongame and Natural Heritage Program protocol, since no corporate database for plants on the RFSS list yet existed.

Evaluation and Conclusions: The species viability evaluation conducted from 2001 to 2004 made use of all the data that had been collected through inventory and monitoring since 1987 to address viability issues and concerns for a large group of plant species. The results of that evaluation and the conclusions regarding plant species viability on the GMNF are included in the Final Environmental Impact Statement for the 2006 Forest Plan (pp. 3-151 to 3-199). One of the results of this evaluation was a desire to develop a more standardized approach to monitoring of our RFSS plant species. During FY06, the Forest Service developed a monitoring strategy for RFSS plant species that we hope to implement next year. We will be testing and adapting these protocols over the next 2-3 years in the hope of monitoring these species on a more regular basis and ensuring the data we collect is consistent with that collected by VNNHP and others doing similar monitoring.

While the monitoring protocol for *Panax* was effective once populations were found, only three of nine populations were found, despite extensive search. Those that were found were marked using GPS, which should make them easier to relocate in the future. Of the three populations found, two had infestations of non-native invasive plants nearby.

Gathering quantitative data as part of monitoring *Polemonium* continues to be difficult. Ramets (stems that are vegetatively produced) are difficult to distinguish from genets (genetically distinct individuals), and adjacent vegetation is often tangled with the *Polemonium*, making it hard to count stems without damaging them. A new method was used, in which canopy cover within a plot ring was recorded for comparison with future data. Qualitatively, plants at this site appear to be less vigorous than in previous years.

Recommendations: During FY07, the Forest Service plans to monitor approximately 20 sites for RFSS plants, in order to get all populations on a 5-year schedule. GMNF staff will be testing protocols developed by the Forest Service for the Natural Resource Information System (NRIS) TES Plants for this monitoring and will be entering this data into the national database if it is available at that time.

Additional searches for *Panax* should occur to determine whether populations have disappeared, or searches have simply not occurred in the right location. If located, populations should be marked in GPS.

Other *Polemonium* populations should be monitored, and the proposed administrative study should be implemented and monitored.

Evaluation Question #2:

What differences exist between wildlife use of more or less remote areas of the GMNF? Within the remote areas, what differences exist between wildlife use of areas that undergo or prohibit habitat management?

Background: There has been no specific monitoring completed in regard to this evaluation question. This question was established to quantify the establishment of the Remote Wildlife Habitat Management Area and the Wilderness Study Areas on the GMNF.

Monitoring Activities: In FY06, the primary effort was placed on assessing existing data and identifying gaps in information. Currently there are a variety of efforts ongoing across the GMNF, being lead by a variety of interested individuals, groups, and partners. These efforts are monitoring individual species and habitat conditions in a variety of situations and habitats. Surveys and monitoring continue to take place at the highest elevations for Bicknell's thrush by the Vermont Institute of Natural Science. Vermont Department of Fish and Game in coordination with local Universities such as University of Vermont and Middlebury College survey and monitor everything from birds to mammals to reptiles and amphibians. The GMNF continues to monitor Management Indicator Species (MIS), Regional Forester Sensitive Species (RFSS) and other species of concern, and expand those monitoring efforts across the Forest, in remote areas as well as areas having extensive activities. All of these efforts will be analyzed so that a story can be told with regard to the benefits of management direction, whether that direction is limited activity or active manipulation.

Evaluation and Conclusions: At this point there is little information to evaluate across the spectrum of management direction. Our survey and monitoring efforts are intended to test the assumptions made with regard to remote areas and habitats on the GMNF as they compare to those areas of the forest under more active management recommendations.

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

Evaluation Question #3:

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?

Background: Until 2006, there were no nesting bald eagles in the State of Vermont. The greatest potential for nesting occurs in the Champlain and Connecticut River valleys. In 2004, a group of partners including the United States Fish and Wildlife Department and the Vermont Fish and Wildlife Department began hacking young eagles at the Dead Creek Wildlife Management Area in the Champlain Valley (hacking is a process of raising bald eagle chicks in semi-captivity in elevated boxes, protecting them from predators and providing food, while minimizing human contact and subjecting the birds to the elements.). In 2006, a pair of bald eagles was confirmed nesters in the Connecticut River Valley.

Monitoring Activities: The Forest Service have been working cooperatively with local conservation organizations, and State and federal agencies. Each year, as the nation-wide bald eagle population grows, individuals eagles are sighted more often in and around the GMNF. Each sighting is noted, considered, and follow-up actions including area surveys and monitoring occur to determine the status of the bird sighted. In 2006, one such local survey was done near Chittenden Reservoir with negative results. Thus far it appears as if the sightings are of transient birds late in the nesting season. Agencies such as the United States Fish and Wildlife Service and Vermont Fish and Game Department monitor Bald Eagle nesting closely as do several local groups such as Vermont Institute of Natural Science and Vermont Audubon.

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

Recommendations: No changes needed at this point.

Evaluation Question #4:

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

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

Monitoring Activities: The Forest Service has been working cooperatively with local conservation organizations, and State and federal agencies. In December of 2005, the Bicknell’s Thrush (Catharus bicknelli) Conservation Strategy for the GMNF was completed. This Conservation Strategy was prepared by: Christopher C. Rimmer, J. Daniel Lambert, and Kent P. McFarland of VINS. This document will help guide the Forest in the planning and analysis of activities in those habitats associated with breeding Bicknell’s thrush.

Annual monitoring of high elevation peaks across the GMNF occurs by volunteers working in conjunction with the monitoring programs organized by VINS. In addition to the annual monitoring that is conducted across the Forest, GMNF biologists and technicians also conduct survey activities at

sights where management actions may have an impact on potential thrush populations. The GMNF utilizes the established Mountain Bird Watch survey protocols.

Evaluation and Conclusions: Populations of Bicknell's thrush continue to decline in the United States and on the GMNF. 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 FY06 is invaluable in the guidance of management activities toward the protection and enhancement of Bicknell's thrush habitats.

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

Evaluation Question #5:

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

Background: The Vermont Loon Recovery Project (VLRP) has lead the effort to restore loons to waters that nearly lost them. The VLRP is a joint program of VINS and the Vermont Fish and Wildlife Department. In 1984, Vermont contained only 7 nesting loon pairs on twelve territories fledging 9 chicks, and in 2004 there were 43 nesting loon pairs on sixty-four territories fledging 44 chicks.

Monitoring Activities: The Forest Service has been working cooperatively on loon management with local conservation organizations, and State and federal agencies. Monitoring activities in 2006 included the annual survey of large and moderate sized lakes on the GMNF in conjunction with the VINS organized Loon Watch Day. Green Mountain National Forest biologists and technicians surveyed five ponds on the National Forest, while volunteers surveyed several other GMNF ponds.

Evaluation and Conclusions: Surveys were conducted by Forest Service staff and volunteers with the analysis of trends completed by VINS staff. The data shows a general increase in populations throughout the State of Vermont and on the GMNF. The data and survey information still however show that threats such as human disturbance, predation, disease, and water level manipulation can have a negative impact on nesting loons.

Recommendations: Continue to monitor GMNF lakes in conjunction with VLRP monitoring efforts. Consider the need to monitor human activities, and their impacts to nesting loons, at popular GMNF lakes and address the need of actions to protect nesting pairs on the National Forest.

Evaluation Question #6:

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?

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

Monitoring Activities: In addition to the valuable information we have been able to use from the Vermont Reptile and Amphibian Atlas project, the Forest Service began identifying sites in 2006 to

survey for reptiles and amphibians. In 2006, GMNF staff identified sites where activities would be taking place or had taken place, and sites where activities are unlikely to take place with the goal of adding to the Vermont Atlas and identifying the habitat needs and population trends of forest reptile and amphibian populations. In addition, Forest Service technicians conducting annual stream inventories continue to report sightings of the species.

Forest biologists and technicians will begin in FY07 to conduct general site surveys for reptiles and amphibians in areas where management activities are proposed as a priority. In subsequent years, the Forest Service will expand surveys out to areas where management activities have occurred and where management activities are unlikely to occur.

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

Recommendations: Continue to survey and monitor sites for these RFSS and increase the number of sites monitored each year as time and funds allow.

Evaluation Question #7:

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

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

Monitoring Activities: In FY06, the Forest Service participated in a survey of Greeley Talc Mine in cooperation with the University of Vermont. The GMNF staff did not participate in any other site specific bat surveys; instead we continued to work cooperatively with State and federal agencies in monitoring and surveying for bats on lands adjacent to the Forest in an effort to gain a better understanding of bat movements and activities on the National Forest. The Vermont Fish and Wildlife Department is the lead for bat survey and monitoring in Vermont. All aspects of our monitoring program are coordinated with Vermont Fish and Wildlife and the US Fish and Wildlife Service.

Evaluation and Conclusions: No further evaluations or conclusions were made as the result of the FY06 monitoring year.

Recommendations: The GMNF staff will continue to participate in woodland bat surveys and monitoring efforts.

Evaluation Question #8:

Do gray wolves, eastern cougars, or Canada lynx occur on or near the GMNF?

Background: The GMNF has historic occurrence records for three Threatened and Endangered (T&E) species: the eastern cougar, gray wolf, and Canada lynx. There are no known occurrences currently in this area. There is little or no potential or critical habitat within the GMNF for any of these species.

Monitoring Activities: No monitoring occurred.

Evaluation and Conclusions: The Forest Service continues to cooperate and consult with the US Fish and Wildlife Service in regard to those T&E species that have historically occupied or have the potential to occupy habitats in the State of Vermont. Each management activity that is addressed on the GMNF is considered in regard to the conservation of these species.

Recommendations: Continue to consult with the US Fish and Wildlife Service and monitor population records and sightings.

Evaluation Question #9:

Do odonate and lepidopteran 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 does not keep records of its odonate species (dragonflies, damselflies). Vermont Institute of Natural Science group of citizen scientists are currently creating an atlas of Vermont's lepidopteron (butterflies and moths). In an analysis completed on 2002, several experts and several 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 the 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: No monitoring activities occurred in FY06, outside the State-wide butterfly survey activities being undertaken by the Vermont Institute of Natural Science.

Evaluation and Conclusions: It is well established that each of the RFSS odonates occurs in stream-side or wetland conditions. Forest Plan standards and guidelines 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. In addition, the 2006 Forest Plan has increased the protections of forested wetlands and seasonal pools, considered to be odonate prime habitat. More and 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 Vermont Institute of Natural Science group of citizen scientists. As information becomes available, the Forest Service will incorporate the data into analyses of management actions.

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

Evaluation Question #10:

What is the population trend of peregrine falcons on the GMNF and adjacent lands?

Background: Due to the historical use of the pesticide DDT, the peregrine falcon was extirpated in the Eastern U.S. by the mid-1960s. The peregrine falcon was removed from the Federal Endangered Species List in 1999. In Vermont, 93 young birds were released at 3 hack sites from 1982 to 1987, including: Mount Horrid, Marshfield Mountain, and White Rocks. In 1984, a territorial falcon pair reoccupied the cliffs of Mount Pisgah and returned the following year to nest successfully. The peregrine falcon continues to remain on the Regional Forester Sensitive Species list for the GMNF.

Vermont's peregrine falcon breeding population increases steadily, paralleling similar trends throughout much of the eastern United States. The Vermont Institute of Natural Science (VINS) and the Vermont Fish and Wildlife Department have closely monitored the species recovery. In the spring of 2005, the peregrine falcon was officially removed from the Vermont List of Threatened and Endangered Species.

Monitoring Activities: Although peregrine falcons are no longer federally listed under the Endangered Species Act, the Forest Service continues to monitor and protect their nesting eyries. The Forest Service has been working cooperatively with local conservation organizations, State and federal agencies for several years to monitor peregrine falcons. In FY06, GMNF staff and volunteers surveyed and monitored four sites on the GMNF. The Forest Service continues to monitor peregrine falcons to assist in the state-wide and national efforts of monitoring the species and the GMNF efforts in assessing the adequacy of Forest Plan guidance and the need for any additional protective measures.

In FY06, the GMNF staff identified 3 territorial pairs with two of the pairs successfully reproducing and fledging young. Also in FY06, trail closures were put in place and monitored during the nesting season to reduce the impacts of forest users on nesting falcons.

Evaluation and Conclusions: Vermont's Peregrine Falcon breeding population reached a new post-DDT record high of 34 territories in 2006, surpassing the previous 2005 record of 32 pairs. Trends on the GMNF 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 #11:

To what extent are non-native invasive species impacting other Forest resources?

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 the Forest Service wants to protect or in areas most likely to be sources of seeds or plant propagules that could be dispersed to areas we want to protect. Monitoring and evaluation also includes reviewing the results of treatment efforts and in the future may include determinations of invasiveness.

To date, 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, and volunteers have surveyed the extent of infestations along many trails, 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, along the main stems of the Batten Kill and White River and their tributaries, and in project sites (areas prioritized for protection).

With the exception of riparian areas, most sites surveyed have had few or no infestations of NNIS, and many infestations are small and isolated. However, some species that were not expected to occur on

the GMNF (because of high elevation or relatively low disturbance) have been found there. In addition, riparian areas, especially the main stems of major rivers, are often found to have extensive infestations of NNIS, especially Japanese knotweed along the White River. 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. The GMNF NNIS list includes one species from the Federal Noxious Weed List and all Class A and Class B Noxious Weeds on the Vermont Quarantine list (see Appendix B).

Monitoring Activities: In May through September of 2006, the following areas were monitored and surveyed for infestations: parts of the Batten Kill main stem and many tributaries and adjacent trails and roads; tributaries of the White River; ten sites along the White River where floodplain restoration, including manual control of Japanese knotweed, is occurring; trailheads and trails in and adjacent to Wilderness areas; sites where projects were proposed; and some ski areas. Surveys of rivers, their tributaries, and adjacent trails and roads were completed by Forest Service staff; this includes the White River floodplain restoration project, where groups of volunteers are cutting back Japanese knotweed a minimum of three times per growing season, and the resulting infestation is monitored by Forest Service staff. Sites in or adjacent to Wilderness were surveyed by wilderness rangers. Sites of proposed projects were surveyed by the Forest botanist and forestry technicians. Ski areas were surveyed by Forest Service staff and ski area employees.

Monitoring NNIS infestations along rivers, their tributaries, and adjacent trails and roads occurred after discovering the extent of Japanese knotweed infestations along the main stem of the White River. Since this species can be dispersed by water or by road or construction equipment, the widespread nature of these infestations suggested that control would only be possible if adjoining tributaries, trails, and roads were surveyed, followed by development of a Cooperative Weed Management Area with adjacent landowners. This monitoring approach is being duplicated in the Batten Kill watershed.

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 and wilderness managers were required to develop NNIS management plans. Sites of proposed projects were monitored to evaluate the potential for NNIS to spread during project implementation. Monitoring NNIS at ski areas occurred because of anecdotal reports that some NNIS, e.g. purple loosestrife, were becoming widespread in these managed settings, and had the potential to spread to adjacent natural habitats.

All data was gathered using the USDA Forest Service Natural Resources Information System (NRIS) protocol, and entered into the NRIS Terra corporate database. All monitoring was completed between mid-May and late September.

Evaluation and Conclusions: While monitoring indicated the extent of NNIS infestations, we do not currently have a means of measuring the effect of NNIS on other resources, nor do we have measurements of the same infestations over time, which would indicate the invasiveness of a particular NNIS. Monitoring protocols were otherwise efficient and easy to use; an indication of this is that volunteers have been fairly easily trained and assigned to projects.

Results of river surveys indicated the need to work cooperatively with other landowners to control NNIS in riparian areas that cross the GMNF. Infestations of NNIS are often continuous across lands under different ownership, and infestations controlled by one land owner but not by adjacent landowners would simply re-establish on land where they have been controlled. Results of monitoring the volunteer Japanese knotweed control sites indicated 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 how difficult these relatively small isolated patches would be to control. Results of the wilderness surveys showed that there are not many infestations, and most are fairly small, isolated, and capable of being manually controlled. Results of the monitoring of project areas indicated that NNIS are sometimes present in surprising places, although often in small amounts. Overall, monitoring results showed that sizes of riparian infestations, amount of labor needed to control some of them manually, and the potential for increased distribution of NNIS across the GMNF, all point to the need to develop a Forest-wide plan for integrated pest management for all NNIS.

Recommendations: In order to address NNIS infestations on the GMNF, information about NNIS, the threats they pose, and how to survey them must be shared with adjacent landowners and other interested parties. Ideally, Cooperative Weed Management Areas should be formed to expand the monitoring that occurs on National Forest System lands, and also on adjacent lands, including roadsides which provide avenues of dispersal for NNIS. Controlling and monitoring the effectiveness of NNIS infestations should be part of project proposals, especially large integrated resource projects. Ultimately, the GMNF should develop a Forest-wide proposal for integrated pest management of NNIS.

Evaluation Question #12:

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?

Background: Deer wintering areas, or “deer yards,” include two basic habitat components required by white-tailed deer during winter: shelter from harsh weather conditions, and food or browse. Softwood stands with high crown closure create shelter or “cover,” which provides protection from snow depth, wind, and cold temperatures. Hardwood and softwood regeneration provide accessible food or “browse.” The quality of DWAs is determined by forest stand characteristics, such as species composition, maturity, height, and closure of the canopy, which vary by site specific features, such as elevation, slope, aspect, and soil type (Reay et al. 1990). The Vermont Fish and Wildlife Department mapped potential deer wintering areas in Vermont during the 1980s. The Vermont deer herd in 2006 is proximately half as big as it was in the early 1980s when wintering areas were mapped (Vermont Deer Management Team 1997). Thus, mapped DWAs today may represent potentially suitable wintering habitat, not necessarily areas actually occupied by deer during winter.

Monitoring Activities: In FY06, the Forest Service embarked on a process of inventorying habitats and deer use within existing GMNF deer wintering areas. The monitoring activities are intended to collect data regarding current animal use, cover condition, forage availability, and opportunities. This data will be used to inform project analysis and will be shared with the State of Vermont in their management of the Vermont deer heard.

In FY06, approximately 1,030 acres of deer winter habitat was surveyed in Compartments 68 and 69. These areas included the Burnt Meadow deer yard (803 acres) and the French Hollow deer yard (227 acres).

Evaluation and Conclusions: Data gathered in FY06 was used to inform one project on the GMNF.

Recommendations: Continue survey efforts and increase the amount of land area surveyed in future years. Incorporate the use of Geographic Information Systems (GIS) into the data gathering and analysis.

Evaluation Question #13:

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?

Background: Early successional communities typically are dependent on stand disturbing events, such as fire, wind throw, flood, timber harvest, or agriculture, that create forest openings, which allow sunlight to reach the ground. The species and characteristics of vegetation on these sites progress through reasonably predictable successional (or seral) stages, reverting eventually to mature forest. In the past, the Forest Service has monitored the number of acres in the 0-9 year age class and monitored the population trends of species that occupy this stand condition. In FY06, the GMNF staff instituted a monitoring protocol to measure the use and impacts of early successional habitats.

Monitoring Activities: In FY06, the Forest Service identified sites where activities would be taking place or had taken place and sites where activities are unlikely to take place with the goal of identifying the habitat uses and population trends of early successional and interior forest bird species. Forest biologists and technicians will begin in 2007 to conduct general site surveys for forest birds in areas where management activities are proposed as a priority. In subsequent years, we will expand our surveys out to areas where management activities have occurred and where management activities are unlikely to occur.

Evaluation and Conclusions: At this point there is little information to evaluate. Forest Service surveys and monitoring efforts are intended to test common assumptions and concepts with a more intensive survey of areas within forest openings as well as forest interior, and around interior forested stands as well as sites under management.

Recommendations: Continue to survey and monitor sites for 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 and by utilizing local volunteer groups and interested organizations.

Evaluation Question #14:

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

Background: This evaluation question is intended to measure project implementation and the effectiveness of standards and guidelines with regard to providing an adequate number of dead and dying trees for cavity dependant birds and mammals.

Monitoring Activities: Monitoring began in 2006 by incorporating three levels of review. The first level of review is an analysis and review of marking guides which assemble project mitigations for the on-the-ground layout of activities. The second level of review is of the implementation of those marking guides and the identification of proper leave trees. The third level of review is of the resulting preserved trees, their number, condition, and availability to those species for which they were retained.

In FY06, monitoring activities began in all three of these areas. Data from these monitoring efforts will be used in future analyses.

Evaluation and Conclusions: No evaluation or conclusions at this time.

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

9. Insect and Disease Levels

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.

Evaluation Question #1:

To what extent have destructive insects and disease organisms increased?

Background: This monitoring item helps track trends in insect and disease (I&D) activity on the GMNF. 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 (Agrilus planipennis), Sirex wood wasp (Sirex noctilio Fabricius), and exotic insect pests, has become a regional monitoring effort. In this case, early detection efforts are the combined focus of forest research and management organizations at the state, federal and university levels.

Monitoring Activities: In FY06, a number of insect and disease monitoring efforts were undertaken on the GMNF, in concert with numerous individual and agency partners. The following insects and diseases were tracked, and listed below are the organizations or agencies involved in, and the dates and types of I&D monitoring efforts used:

Insect or Disease Agent	Organization Doing Monitoring	Date and Type of Monitoring Effort
Forest tent caterpillar, gypsy moth, anthracnose disease, birch leafminer, and balsam woolly adelgid	Northeastern Area State and Private Forestry, Forest Health Protection, and U.S. Forest Service	June 12 and 13, 2006: Aerial Detection Survey
American beech bark disease, Spruce budworm, and bark beetles	Same as above	Summer 2006: Sugarbush health monitoring including ground surveys and root starch sampling,
Butternut canker	U.S. Forest Service (GMNF staff) and contracted specialists	To be completed in FY07

Evaluation and Conclusions: Insect epidemics tend to occur with great variations in population numbers, a result of the combination of susceptible host habitats, favorable weather conditions, and previous year population levels. In 2006, the most significant damages on the GMNF observed were defoliation from forest tent caterpillars, along with a variety of damages to birch trees. Aerial detection resulted in mapping of roughly 28,000 acres of tent caterpillar defoliation on hardwoods. Additionally, birches were impacted by a combination of anthracnose disease, birch leafminer, and possibly *Septoria* leaf spot (aerially observed, not confirmed). Forest tent caterpillar populations have been building, with the expectation that a population fall will occur naturally in the near future. A single exotic wood wasp,

(Sirex noctilio Fabricius) was discovered in Vermont in the Stowe area. No Emerald ash borer has been noted in 2006 or in 2007 in Vermont.

Recommendations: Continue annual aerial detection and ground survey monitoring efforts for the agents listed above and add surveys for Sirex and Emerald ash borer as well. Pine plantations will be monitored for Sirex in 2008.

Forested stands surrounding developed campgrounds are considered higher risk for occurrence of Emerald ash borer as people may bring firewood with them to Vermont from areas afflicted with this species. In 2005, the Forest Service risk-rated campground areas in the GMNF and since have cooperated with the State of Vermont and Forest Service State and Private Forestry in providing posters, handouts, and information regarding these threats to the public in our campgrounds and offices. We will plan on dissecting dead ash trees in proximity to GMNF campgrounds looking for galleries of Emerald ash borer in 2008.

10. Wildlife: Management Indicator Species

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.

Evaluation Question #1:

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

Background: The Forest Service began monitoring MIS in 1987. Collection of population data has been facilitated through the efforts of local universities, the Vermont Department of Fish and Wildlife, and numerous volunteer groups and individuals. While the Forest Service has been unable to consistently collect annual population data due to a variety of factors such as weather, staffing, or funding, we remain consistent in collecting some annual information about each of the MIS.

Monitoring Activities: The Forest Service continues to work cooperatively with local conservation organizations and State and federal agencies in the gathering of MIS data. In FY06, the GMNF staff and volunteers collected data on four MIS: gray squirrels, American woodcock, brook trout, and ruffed grouse. This monitoring was done in an effort to add data and continue the pursuit of quantifiable information that will determine the trends of populations and their habitats as the result of Forest Service management practices. Each of the monitoring activities was completed following protocols established in 1982.

Evaluation and Conclusions: Management Indicator Species survey data was compiled and assessed in FY01 in an effort to detect trends; data collected since then has not changed that assessment. Forest Service assessments reported that some species, such as the American woodcock and white-tailed deer, have shown a population decline. Monitoring of brook trout populations show the species remains stable in GMNF streams. Twenty-eight sites in 23 streams monitored in FY06 averaged 795 wild brook trout per mile. This population is below the 10 year average of 1,025 wild brook trout per mile, but within the expected range of natural variability. 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 #2:

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?

Background: The vegetation on most lands in the GMNF has been growing and aging. The logical result of this trend is that MIS requiring mature habitats, such as gray squirrels, would be increasing and MIS requiring early successional habitats, such as American woodcock and ruffed grouse, would be decreasing. While an analysis in 2001 showed a decline in American woodcock, the other MIS showed no discernable trend.

Monitoring Activities: The Forest Service continues to work cooperatively with local conservation organizations, and State and federal agencies to survey and monitor GMNF MIS. In 2006, Forest Service volunteers and staff conducted surveys for the gray squirrel, ruffed grouse, brook trout, and American woodcock wherever and whenever possible on established routes. The data was added to the existing database of information for future analysis.

Forest Service biologists continue to provide guidance 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 2006 Forest Plan and is transferred to each analysis area based upon the unique characteristics of the site and the opportunities each site provides.

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

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

11. Air Quality and Atmospheric Deposition

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

Evaluation Question #1:

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

Monitoring Activities: This question will be addressed in a comprehensive analysis in the FY07 report.

12. Soil Quality

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

Monitoring Driver: Forest Plan Goal 3

Evaluation Question #1:

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?

Note: For additional information related to soil resources, see Section 5: Forest Plan Management Area Guidance, Evaluation Question #5.

Background: These questions are addressed annually through implementation and effectiveness monitoring of S&Gs and mitigation measures.

Monitoring Activities: In FY06, the Forest Service monitored the North Half Overstory Removal, and Holt Mountain, Greendale harvest areas (see the response to Evaluation Question #5 in Section 5 for more information). In addition, the GMNF staff spent considerable time in FY06 discussing the proper implementation of Soil, Water and Riparian guideline G-10, which reads: "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." An integrated team of resource specialists, including wildlife and fisheries biologists, soil and water specialists, and members of the Forest Planning Team, made field visits to decide how to best implement this guideline. Integrated team members held a variety of professional opinions on how to best protect and improve lands within 100 feet of wetlands and seasonal pools. For the Greendale and Nordic sale areas, team members agreed to leave trees (no harvest) adjacent to wetlands and seasonal pools, in order to provide shade and future downed woody debris for species that frequent wetlands such as amphibians and frogs.

Evaluation and Conclusions: The implementation of Forest Plan S&Gs and mitigation measures were generally effective therefore, the soil, water, and wetland resources were protected. See monitoring to address Evaluation Question #5 in Section 5 for more information.

Recommendations: Continue annual monitoring efforts, including the discussions on implementation of Forest Plan Guideline, G-10. There may be a need to revise or clarify the wording of G-10 in the future.

13. Water Resources

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

Evaluation Question #1:

How are fish habitat and stream channels changing over time?

Background: The Forest Service has been monitoring fish habitat in streams and rivers since 1988 in compliance with the 1987 Forest Plan. This monitoring documented habitat features and physical characteristics of streams at specific locations representing different stream sizes and habitat types across the GMNF. Habitat measurements were subsequently compared between years and among sites to evaluate changes. This method proved difficult to repeat with precision and was less sensitive to detecting subtle habitat changes therefore, the Forest Service adopted a habitat and channel monitoring protocol in 1999 based on stream geomorphology principals (called Level III stream monitoring) that would reliably and accurately document stream habitat conditions (e.g. longitudinal profile, x-sectional area, pebble counts, habitat composition) over time. Approximately 40 permanently marked (monument) sites on approximately 35 streams representing the range of stream sizes were established throughout the GMNF, with representation provided in each management area. Each site is monitored every five years, which provides a science-based process to detect fish habitat and stream channel changes in managed and unmanaged areas of the Forest. This monitoring allows for detection of effects from management activities and from those associated with natural variability, as well as for assessment of Forest-wide trends over the long term.

Monitoring Activities: In 2006, fish habitat and channel monitoring occurred in eight sites on seven streams. These streams included: Bingo, Bolles, Clark, Lamb, Sucker and Utley Brooks as well as the South Branch of the Middlebury River.

Evaluation and Conclusions: A preliminary review of the data collected in 2006 indicates that fish habitat conditions are good and channel geomorphology is stable within these streams, and all are within the range of natural variability for upland streams. A more detailed analysis of these and other years data will be done every five years based on information found in the GMNF Monitoring Guide.

Recommendations: Continue to conduct regularly scheduled level III monitoring sites for FY07.

Evaluation Question #2:

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

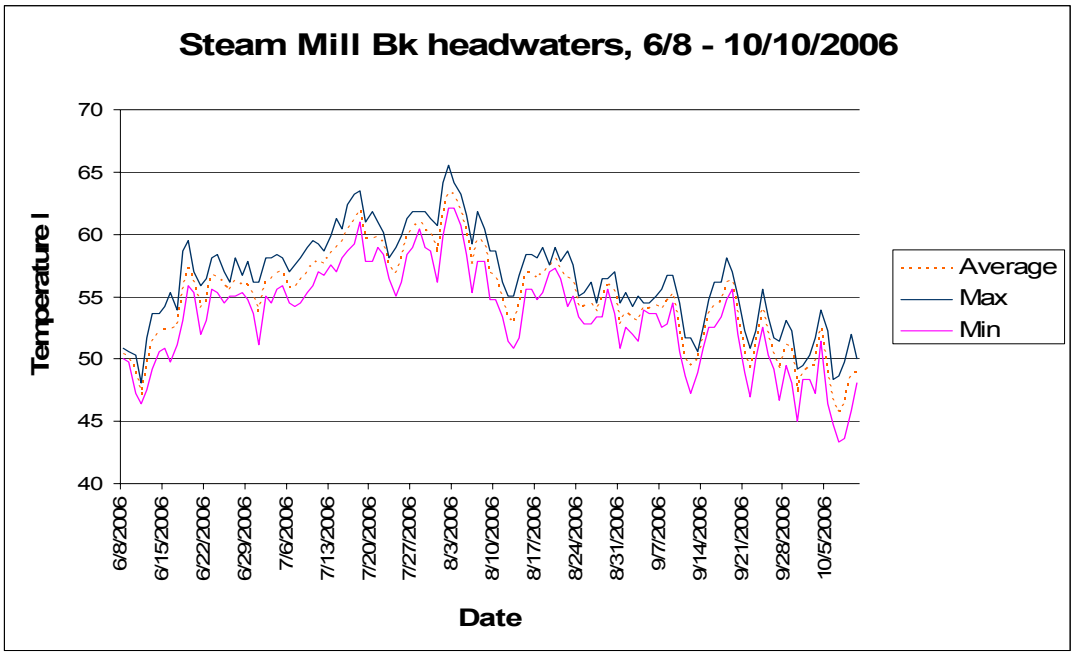
Background: Water temperatures are critical to the survival of populations of native fish and aquatic invertebrates. The Forest Service has been monitoring water temperatures in streams and rivers since 1988 in compliance with the 1987 Forest Plan. The objective of this monitoring has been to measure daily water temperatures from spring through fall and then evaluate these data for average, maximum, and minimum temperature limits. Monitoring has been conducted in most of the watersheds on the GMNF over the past two decades. These data have been evaluated and reported in past GMNF monitoring reports. These data have also been used to identify and maintain high quality cold water streams, and to develop projects to enhance or restore riparian habitat by planting stream bank buffers where water temperatures were too high due to poor stream shading. Water temperature monitoring will continue during implementation of the 2006 Forest Plan.

Monitoring Activities: Stream temperature monitoring was conducted in the West River and Otter Creek watersheds on the GMNF in 2006. The following summarizes the activity for the streams in each watershed:

- West River: 15 loggers were placed in Flood Brook, Utley Brook, Jones Brook, and Mt. Tabor Brook, 4/30/06 – 10/4/06.
  - 3 in Flood Bk.
  - 3 in Jones Bk.
  - 3 in Mt. Tabor Bk.
  - 6 in Utley Bk., including "North" Utley Brook
- Otter Creek: 5 loggers were placed in Furnace and Steam Mill Brooks, 6/8/06 – 10/10/06
  - 1 in Steam Mill Brook headwaters, at the confluence of Puss N' Kill and Kettle Brooks
  - 1 in Steam Mill Brook upstream of the Baker Brook confluence
  - 1 in Furnace Brook, downstream of the Beaudry Brook confluence
  - 1 in Furnace Brook, downstream of the Kiln Brook confluence
  - 1 in Furnace Brook, upstream of the bridge on Fish Hatchery Rd.

Evaluation and Conclusions: A preliminary review of the data collected in 2006 indicates that water temperatures in the streams monitored are good, and generally fall within a range that supports healthy fish and aquatic insect populations. Streams with average daily temperatures below 70 degrees Fahrenheit, (a threshold level), are not considered to be stressed by summer water temperature regimes. Figure 13.1 is an example of such a stream on the GMNF. A more detailed analysis of these and other year's data will be done every five years based on information found in the GMNF Monitoring Guide.

Figure 13.1 Sample stream with average daily temperatures below 70 degrees Fahrenheit.



Recommendations: Continue to conduct water temperature monitoring on a regular basis in GMNF watersheds.

Evaluation Question #3:

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

Background: Water quality monitoring on the GMNF has occurred since 2002 on sites throughout the Forest to track dispersed camping, developed campgrounds, past or future timber sales, and possible future watershed assessment basins. In addition, water quality macroinvertebrate monitoring has been conducted on the GMNF since 1993 by the State of Vermont Department of Environmental Conservation (DEC). This water quality monitoring on the GMNF occurs in order to meet Forest Plan management direction Goal 4, which is to "Maintain or restore aquatic, fisheries, riparian, and wetland habitats", with objectives to "Minimize the adverse impacts on aquatic, fisheries, riparian, vernal pool, and wetland resources from management activities" and to "Restore and improve aquatic, riparian, fisheries, and wetland resources" (Forest Plan, p. 13)

Monitoring Activities: Water quality monitoring conducted in 2006 throughout the Forest showed a trend of pH values below Vermont State standards, especially in the south half of the Forest (Manchester Ranger District). These low pH values are not surprising due to the amount of acid deposition in New England. Several monitoring sites showed elevated phosphorus values, which may be due to historic land use practices. Monitoring sites in drainage basins with high urban development showed elevated conductivity and total dissolved solids. Past, present, and future timber sale monitoring sites showed normal levels of turbidity.

State of Vermont DEC Macroinvertebrate monitoring on the GMNF in 2006 occurred on seven sites in the south half of the Forest. This macroinvertebrate monitoring resulted in the majority of the sites rating excellent, with one site rating fair and one site rating excellent–very good.

Water quality and flow monitoring near Lye Brook Wilderness occurred in 2006 on a tributary to Roaring Branch using a United States Geological Survey (USGS) automatic sampler in cooperation with USGS, University of Vermont, and Forest Service Research in Durham, NH. Discharge and chemistry results are pending from the research office in Durham.

Evaluation and Conclusions: Riparian, vernal pool, and wetland habitats are being maintained or restored on the Forest by surveys and inventories that are being conducted during the planning stages of inter-disciplinary projects, in order to protect, manage, and improve the condition of those resources.

Recommendations: Continue water quality and flow monitoring on the GMNF.

14. Recreation

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

Evaluation Question #1:

Is the amount of deferred maintenance on the GMNF trail system being reduced?

Background: The GMNF has a large and diverse trail system, however the Forest Service has a limited budget to operate and maintain all the trails. To address this, the GMNF has a number of partners that contribute to some portion of the maintenance however, this may not be sufficient to meet long-term needs. With a desire to provide high quality recreation, the Forest Service needs to monitor to determine if the trail system is being maintained or improved.

Deferred maintenance refers to the amount of trail maintenance (repair, annual maintenance, rehabilitation) that was not completed when it should have been or when it was scheduled. For trails, typical maintenance activities include fixing old bridges, repairing trail tread, clearing tree blow downs, repairing puncheon, or repairing signage. The trail system monitoring employed on the GMNF began in FY99 as a result of Congressional direction regarding deferred maintenance reporting. The Forest Service has completed some level of recreation site monitoring and data review since that time. During the first years of this process, the Forest Service was required to sample 20% of the trail system in any given year.

Monitoring Activities: In FY06, the Forest Service completed required condition surveys using revised national protocols that reduced sample size by using a statistical sample of trails.

The monitoring is being done to respond to Forest Plan Goals and Objectives, including:

- Goal 12, Objective: Increase the number of miles of trails that are operated and maintained to full standard.
- Goal 12: Objective: Reduce the total deferred maintenance on the GMNF trail system.

Evaluation and Conclusions: The protocols being used are consistent with national direction and provide the necessary information to answer this monitoring question. A more thorough evaluation of procedures and the status of the data will be analyzed in the FY07 Annual Monitoring and Evaluation Report.

Recommendations: The Forest Service should continue to use existing protocols until adjustments to respond to changed national standards are needed. At this time, sample size appears to be adequate to maintain developed site data. Changing national direction that is trending toward reduced sample size may eventually reduce the quality of our data over time. It is recommended that a larger sample be completed when funding allows. It is also recommended that the Forest Service complete an updated assessment of deferred maintenance on the trail system for FY07. This will serve as a baseline to determine trends in deferred maintenance.

15. Wilderness

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

Monitoring Driver: Forest Plan Goal 13

Evaluation Question #1:

What are the status and trends of inholdings?

Background: As of FY06, there were six private inholdings, totaling 113 acres all within the Lye Brook Wilderness. In addition, the Forest Service administers one life tenure special use permit for a camp in Big Branch Wilderness.

Monitoring Activities: No specific monitoring was recorded on these inholdings for FY06.

Recommendations: Annually monitor wilderness inholdings for non-conforming uses such as mechanized equipment use, motorized equipment use, timber sales, and site improvements. Take administrative/law enforcement actions as necessary. Continue to make acquisition of these parcels a high priority.

Evaluation Question #2:

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?

Background: In FY06, GMNF Wilderness staff worked with the Forest Service Region 9 Air Quality Specialist to determine Air Quality Related Values (AQRVs) and sensitive receptors to set a baseline for monitoring biophysical conditions sensitive to human threats.

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

Breadloaf Wilderness – Vermont Nongame Natural Heritage Program surveyed Significant Ecological Sites for threatened and endangered species. Determined the potential for *Polemonium vanbruntiae* (cliff-dwelling plant) occurrence.

Big Branch/Peru Peak Wilderness Areas – 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.
- 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.
- 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 to the west of Lye Brook.
- Background visibility monitoring with a camera installed near Branch Pond Road, just south of Lye Brook Wilderness, since 1986 to document background visibility from May 1 to October 30.
- 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.
- 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.
- Since 2001, the USDA-NRCS (Thomas Villars, Soil Resource Specialist) 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 sites established nearby.

Evaluation and Conclusions: More work will need to be done in upcoming fiscal years to synthesize the findings in these studies.

Recommendations: Continue these monitoring efforts and analyze the results of the collected data.

Evaluation Question #3:

What are the status and trends of the use of motorized equipment and mechanical transport?

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 goes through a Minimum Requirements Decision Guideline (MRDG), commonly referred to as a "minimum tool" exercise. The intent of the minimum tool is to determine both the minimum management action to meet objectives, as well as the minimum mode of accomplishing the task (i.e. cross-cut saw or chainsaw).

A minimum tool was completed in 2002 to authorize the stocking of high elevation ponds within GMNF wilderness areas. This analysis utilizes the enabling legislation, Forest Plan direction, and national Forest Service direction for managing wilderness.

Monitoring Activities: The fisheries program, in coordination with the Vermont Fish and Wildlife Department, 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. Each pond was staffed during this activity to provide education to Forest visitors and to monitor the impact to visitor experience.

Evaluation and Conclusions: Fisheries staff stocked approximately 9,000 brook trout fry in Bourn Pond and approximately 2,000 fry in Big Mud Pond during the first week of June 2006. Total flight time over these ponds was less than 5 minutes, while total transport time over each wilderness was less than 10 minutes. The time of year (early June) was originally selected to provide the least impact to wilderness visitors (black fly season, low historic use period) and was validated by field staff.

Natural populations of brook trout are not sustainable due to human effects (acid precipitation and sedimentation). Stocking young/small brook trout is the least invasive means of approaching a natural condition of having a population of trout with multiple age and size classes as those that would occur for wild populations.

Recommendations: Review/update minimum tool to validate mode of transport in FY07. Continue to staff ponds on stocking dates to monitor visitor impacts.

Evaluation Question #4:

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

Background: From section 2(c) (2) of the Wilderness Act of 1964, a wilderness "has outstanding opportunities for solitude or a primitive and unconfined type of recreation". From the 2006 Forest Plan, page 49 – "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 eleven 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 address of visitor. Records from multiple years are available for analysis. Staff also provide a uniformed field presence where they document number in groups,

destination, and what message (usually Leave No Trace) was communicated from the GMNF staff to the wilderness visitors. Forest Service staff, as well as Green Mountain Club (GMC) staff and volunteers, monitor groups who require a special use permit to utilize National Forest wilderness. Most notably, the Forest Service monitors freshman orientation groups utilizing the AT/LT trail system and shelters the last weeks of August and first weeks of September. These orientation groups are from local colleges who want to provide an opportunity for incoming freshman to participate in backpacking trips on the GMNF as part of their overall integration into college life.

In FY05, the GMNF 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" (NVUM Monitoring Results, September 2006). Data collected includes general demographics, economics, and user satisfaction. Relevant to this specific question, an estimated 81,959 (+/- 25.5%) visited congressionally designated wilderness areas on the GMNF during FY05). Visitors were able to rate their perception of how crowded a recreation site felt to them. The results for wilderness areas were:

Crowding Rating	Designated Wilderness Areas (% of respondents)
10 Overcrowded	0.0
9	0.0
8	0.0
7	0.0
6	0.0
5	9.0
4	22.4
3	19.4
2	9.0
1 Hardly anyone there	40.1

Recommendations: GMNF staff needs to continue to work closely with GMC staff to evaluate the group use system to determine the carrying capacity for these groups. A comprehensive Limits of Acceptable Change study will be needed to determine the public's perception of crowding and the opportunities for unconfined recreation, solitude, or primitive recreation.

Evaluation Question #5:

What are the trends of physical evidence of modern human occupation or modification?

Background: From section 2(a) of the Wilderness Act of 1964 – "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…" From the 2006 Forest Plan, page 49 – "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, Peru Peak, Big Branch, and Breadloaf Wilderness areas. Evidence of modern human occupation or modification within these areas include trail improvements (puncheon, waterbars, drainage dips, stone steps, corduroy, and bridges) and trail shelters/tent platforms (Cooley Glen – sleeps 8, Emily Proctor – sleeps 6, Emily Proctor tenting – sleeps 8, Skyline Lodge – sleeps 14, Boyce – sleeps 8, Big Branch – sleeps 8, Lost Pond – sleeps 8, and Douglas – sleeps 8). Each of these shelters has an accompanying privy.

The Green Mountain Club (GMC) has a shelter caretaker program and a volunteer corps who provide general maintenance and support to the trail system.

Evidence of previous settlement occurs throughout many areas of the GMNF wilderness areas. This includes old roads, cellar holes, and other structures and features.

Monitoring Activities: GMNF Wilderness and Trails staff work in 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 (trail clearing, privy maintenance, etc.) occurred during FY06.

Evaluation and Conclusions: GMNF staff will continue to work with GMC to evaluate trail infrastructure. A minimum tool analysis will be completed prior to undertaking any project.

Recommendations: Long range management plans should be considered for the management of infrastructure within the Wilderness MAs.

16. Wild, Scenic, and Recreational Rivers

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.

Evaluation Question #1:

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

Background:

National

On October 2, 1968, Congress signed the Wild and Scenic Rivers Act. This 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” (Sec. 1(b)). The Act also states, “In all planning for the use and development of water and related land resources, consideration shall be given by all Federal agencies involved to potential national wild, scenic and recreational river areas…” (Sec. 5(d)). In 1982, the National Park Service first published a Nationwide Rivers Inventory that now lists more than 3,400 US river segments that are believed to have characteristics making them eligible for inclusion in the National Wild and Scenic Rivers System. This list is not exhaustive, however, and other free-flowing river segments within the GMNF possessing one or more outstandingly remarkable qualities are addressed as well.

Green Mountain National Forest

There are currently no federally designated wild, scenic, or recreational rivers (WSRs) within the State of Vermont. The Wild and Scenic Rivers Act directs federal agencies to identify eligible WSRs in their

planning processes. The Forest Service may only recommend a river as eligible and suitable for wild and scenic river status however, as designation of a river occurs through an act of Congress.

During development of the 2006 Forest Plan, Forest Service staff identified eligible WSRs. There are currently seventeen eligible Recreational River segments, eight eligible Scenic segments, and two eligible Wild segments on the GMNF.

Monitoring Activities: Although there are no annual monitoring activities performed on the eligible WSR segments, all proposed projects and activities on the GMNF must be evaluated utilizing the management direction stated in 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 (ORVs) of the identified river are protected.

Twenty-one separate NEPA documents were signed during FY06 on the GMNF and all 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 handbook direction.

Recommendations: Continue to utilize management direction in FSH 1909.12 to analyze the effects of individual projects and activities within these eligible corridors.

17. Interpretation and Education

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

Evaluation Question #1:
Did teacher professional development in Forest stewardship occur?

Background: As described in the 2006 Forest Plan, the role of the GMNF includes emphasis on playing an increasingly important educational role. It is the role of the Forest Service to provide people with a clearer understanding of the origins of the natural resources they use in everyday life so as to develop a greater conservation ethic and sense of personal responsibility for their actions.

Monitoring Activities: In alignment with the role of the Forest, three professional development opportunities occurred in FY06 on the GMNF. Specifics on these opportunities are provided here:

1. **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 Forest For Every Classroom creates a forest stewardship program to build capacity in teachers. They learn about forests, ecology, stewardship, 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 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:

- Additional natural resource-based courses in a reunion setting
- Scholarship help for conferences and workshops
- Small grants for classroom service-learning projects

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

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

   For 12 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, they 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.

3. **A Trail To Every Classroom:** Teachers who are in towns along the Appalachian Trail are targeted to participate in teacher training with the goal of stewardship of the Appalachian Trail. This is a similar program to A Forest For Every Classroom. In FY06, two teachers participated.

Recommendations: Continue to provide professional teacher development opportunities through the continuation of these three programs.

3.1 RESEARCH AND STUDIES

No research activities, studies, or requests for such activities were conducted or received in Fiscal Year 2006 on the GMNF.

4.1 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. No administrative corrections or errata were issued in Fiscal Year 2006 however, work was under way to compile the necessary changes. We will likely issue administrative corrections in the future. These will be available on the following website when completed:
http://www.fs.fed.us/r9/gmfl/nepa_planning/index.htm

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. Future corrections will also be listed in the Green Mountain NF Schedule of Proposed Actions which is distributed quarterly. We will continue to provide opportunity for public involvement at the project level and during any substantive changes to the Forest Plan. There have been no amendments to the revised Forest Plan.

5.1 LIST OF PREPARERS

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

Name	Position
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Pat D'Andrea	Realty Specialist
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Kathleen Diehl	Partnership and Conservation Education Coordinator
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Pam Gaiotti	Budget and Accounting Officer
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APPENDIX A: PAYMENTS TO TOWNS

Green Mountain National Forest Payments in Vermont

There are three types of federal payments reaching municipalities that have U.S. Forest Service land: 1) Payments in Lieu of Taxes (PILT); and Public Law 106-393 – **Secure Rural Schools and Community Self-Determination Act of 2001**, comprised of the 2) 25-Percent and 3) Full Payment Funds. PILT funds are directed to towns, and the Public Law 106-393 funds (either the 25-Percent or the Full Payment 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. Congress, however, rarely appropriates the full amount of the PILT.

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.

SECURE SCHOOLS ACT

The **Secure Rural Schools and Community Self-Determination Act of 2001** (Secure Schools Act) 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, roads, and other purposes. 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.

Current law mandates a floor for payment levels of 25 percent of forest product receipts. The law also provides the option for the distribution of funds above the floor based on the average of the three highest years of 25 percent payments. All counties and localities on the GMNF opted for the optional fund distribution method based on the three highest years of payments.

FY06 Payments to Towns

County	Town	Acres	PILT 2006 ($)	Secure Schools 2006 ($)	Total Payment to Town ($)
Addison	Bristol	5,528	7,987	5,455	13,442
Addison	Goshen	7,562	10,967	7,462	18,429
Addison	Granville	14,894	21,450	14,678	36,128
Addison	Hancock	19,287	27,971	19,031	47,002
Addison	Leicester	2,746	3,968	2,710	6,678
Addison	Lincoln	11,375	15,777	11,224	27,001
Addison	Middlebury	3,366	4,722	3,321	8,043
Addison	Ripton	22,204	32,197	21,910	54,107
Addison	Salisbury	3,830	5,555	3,779	9,334
Addison Total		**90,792 acres**	**$130,594**	**$89,570**	**$220,164**
Bennington	Arlington	3,333	4,834	3,289	8,123
Bennington	Bennington	1,292	1,874	1.275	1,875
Bennington	Dorset	5,577	7,791	5,503	13,294
Bennington	Glastenbury	26,630	21,630	26,276	47,906
Bennington	Landgrove	811	1,170	800	1,970
Bennington	Manchester	5,503	7,840	5,430	13,270
Bennington	Peru	17,235	24,924	17,006	41,930
Bennington	Pownal	3,092	595	3,051	3,646
Bennington	Readsboro	8,303	12,041	8,193	20,234
Bennington	Rupert	168	389	166	555
Bennington	Searsburg	7,632	9,042	7,631	16,673
Bennington	Shaftsbury	1,234	2,778	1,218	3,996
Bennington	Stamford	11,823	16,820	11,666	28,486
Bennington	Sunderland	21,932	31,738	21,641	53,379
Bennington	Winhall	15,917	22,934	15,706	38,640
Bennington	Woodford	26,752	805	26,397	27,202
Bennington Total		**157,234 acres**	**$167,205**	**$153,974**	**$321,179**
Essex	Granby	1,660	2,407	1,637	4,044
Essex Total		**1,660 acres**	**$2,407**	**$1,637**	**$4,044**
Rutland	Brandon	89	129	88	217
Rutland	Chittenden	29,409	42,650	29,019	71,669
Rutland	Killington	1,796	5,540	1,772	7,312
Rutland	Mendon	3,203	4,023	3,161	7,184
Rutland	Mt. Holly	3,360	4,873	3,315	8,188
Rutland	Mt. Tabor	25,117	19,639	24,784	44,423
Rutland	Pittsfield	7,698	11,164	7,596	18,760
Rutland	Wallingford	8,560	13,154	8,446	21,600
Rutland Total		**77,436 acres**	**$101,172**	**$78,181**	**$179,353**

County	Town	Acres	PILT 2006 ($)	Secure Schools 2006 ($)	Total Payment to Town ($)
Washington	Warren	7,224	10,217	7,128	17,345
Washington Total		**7,224 acres**	**10,217**	**7,128**	**$17,345**
Windham	Dover	5,248	7,611	5,178	12,789
Windham	Jamaica	720	2,087	710	2,797
Windham	Londonderry	437	1,018	431	1,449
Windham	Somerset	9,423	7,392	9,298	16,690
Windham	Stratton	18,238	16,528	17,996	34,524
Windham	Wardsboro	3,104	7,824	3,063	10,887
Windham	Wilmington	1,750	2,476	1,727	4,203
Windham Total		**38,920 acres**	**$44,936**	**$38,403**	**$83,339**
Windsor	Rochester	12,600	18,264	12,433	30,697
Windsor	Stockbridge	810	1,179	799	1,978
Windsor	Weston	9,104	13,203	8,983	22,186
Windsor Total		**22,514 acres**	**$32,646**	**$22,215**	**$54,861**

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

GMNF Regional Forester Sensitive Species (RFSS): Plants, 2006

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

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

South Half GMNF

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

North Half GMNF

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

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

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

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

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

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

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

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