Green Mountain National Forest
Monitoring and Evaluation Guide
2007

Bat Monitoring on the Green Mountain National Forest.
Conducted by University of Vermont, October 2006

This document available in large print upon request.

U.S. Department of Agriculture

Forest Service

Green Mountain and Finger Lakes National Forests

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Chapter 1 Introduction to the Monitoring and Evaluation Guide

1.1.1 Introduction

Monitoring and evaluation are required by the National Forest Management Act to determine how well the Land and Resource Management Plan (Forest Plan) is being implemented. Monitoring and evaluation are divided into three broad categories and are designed to answer the following basic questions:

1. **IMPLEMENTATION MONITORING - Did we do what we said we were going to do?** This question answers how well the direction in the Forest Plan is being implemented. Collected information is compared to Management Area direction and Forest-wide Objectives, Standards, and Guidelines.
2. **EFFECTIVENESS MONITORING - Are the standards and guidelines working?** This question answers whether the application of standards and guidelines is achieving the results envisioned in the Forest Plan.
3. **VALIDATION MONITORING - Is our understanding of the situation and information available correct?** This question answers whether the assumptions and predicted effects used to formulate the goals and objectives are accurate.

Chapter 4 (Monitoring and Evaluation Chapter) of the 2006 Forest Plan provides programmatic direction for monitoring and evaluating Forest Plan implementation. It 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. This Monitoring and Evaluation Guide (Monitoring Guide) provides more specific procedural guidance to implement the monitoring strategy outlined in the Forest Plan. This Monitoring Guide contains specific monitoring elements, along with methods, protocols, and analytical procedures to be followed (see Chapter 4 of the Forest Plan for more details on the linkage between these documents). This 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 this Guide during Forest Plan implementation. Monitoring activities may be added or dropped from this Guide as the Forest Service learns through implementation or as additional monitoring methods become available.

The monitoring and evaluation 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 monitoring and evaluation efforts. Through this adaptive management approach, the Forest Plan is kept current.

1.1.2 Monitoring Approach

Monitoring and evaluation are separate, sequential activities. *Monitoring* is the systematic collection of information that reflects changes in actions, conditions, and resource relationships on the Forest. *Evaluation* is the analysis and interpretation of the information collected during monitoring. A key purpose of a monitoring strategy is that the public be given timely, accurate information about Forest Plan implementation. This is done through the release of an annual monitoring and evaluation report.

The Annual Monitoring and Evaluation 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 the monitoring addressed those questions; and if future monitoring activities may need modified. The Annual Monitoring and Evaluation Report will include evaluation of data or comparison of results with those from previous years to identify trends and highlight where management is or is not achieving desired goals. It is during this annual review that Forest Service staff can determine if modifications to the 2006 Forest Plan or the Monitoring Guide are necessary. Priorities for monitoring also will be reviewed and revised (if necessary) each year by Forest Service program managers with responsibility for particular resource areas.

In addition to the Annual Monitoring and Evaluation Report, the Forest Service will produce a comprehensive report every five years. The Annual Monitoring and Evaluation Reports will serve as the foundation for developing the comprehensive report. The comprehensive report will summarize conditions and trends for social, economic, and ecological resources; compare existing conditions to desired conditions; and determine aspects of the Forest Plan that may need amended or revised to adapt to new information and changed conditions.

1.1.3 Monitoring Prioritization

As noted in the 2006 Forest Plan, budgetary constraints affect the level of monitoring that can be done in a fiscal year. In addition to providing for public involvement, the monitoring program must be efficient, practical, and affordable, and may make use of data that has been or will be collected for other purposes. Monitoring tasks are scaled to the Forest Plan, program, or project to be monitored. Each of these entails different objectives and requirements. Monitoring is not performed on every single activity, nor must it meet the statistical rigor of formal research.

Consequently, a prioritization process for Monitoring Guide items was developed to ensure efficient use of limited time, money, and personnel, within the parameters identified in Chapter 4 of the Forest Plan. If budget levels limit the Forest Service's ability to perform all monitoring tasks, then the highest priority tasks are funded first (see Chapter 2 for priority ranking of monitoring activities). The Monitoring Guide establishes a prioritization process for the monitoring items, and the annual monitoring schedule identifies which items will be measured given the current year's funding levels. Priorities may be revised each year. The following questions were used in the prioritization process:

- Is there a high degree of uncertainty associated with management assumptions?
- Is there a high degree of disparity between existing and desired conditions?
- Are proposed management activities likely to affect resources of concern?
- What are the consequences of incomplete knowledge or uncertainty about resource conditions?
- Does monitoring respond to key issues?
- Can monitoring questions be answered in a cost-effective manner?

The Monitoring Guide itself is dynamic, and may be subject to periodic revision to meet current needs during the life of the Forest Plan. The annual monitoring schedules will be subject to budgetary considerations, emerging research, and issue-driven factors that will influence monitoring priorities from year to year.

1.1.4 Monitoring Methods, Tools, and Sources

This Monitoring Guide contains specific monitoring items along with methods, protocols, and analytical procedures for monitoring them. Monitoring design and data collection will follow accepted national standards. Data will be catalogued into appropriate corporate databases such as Automated Lands Program (ALP), Natural Resource Inventory System (NRIS), or Geographic Information System (GIS).

In seeking to assess the effectiveness of efforts to implement the Forest Plan and accomplish high quality, on-the-ground results, the Forest Service will use a wide variety of tools, methods, and information sources. Although this Monitoring Guide provides details for specific monitoring efforts, many other information sources may be used. Not all monitoring information will result from site-specific sampling efforts.

Information sources and monitoring methods to be used in evaluating Forest Service effectiveness may include any or all of the following:

- Accomplishment reports
- Annual project field reviews and National Environmental Policy Act (NEPA) compliance reviews
- General management reviews
- Functional Assistance Trips and Activity Reviews
- Project Administration (Permit/Contract Administrator reports and inspection reports)
- Data or information provided by contractors, permittees, partners, cooperators, researchers, conservation organizations, and other State and Federal agencies.

1.1.5 Purpose of the Monitoring and Evaluation Guide

It must be emphasized that the Monitoring Guide is a guide – it is not a decision document. It is intended to provide guidance for the execution of Forest monitoring and evaluation activities required by NFMA. The monitoring and evaluation process enables the Forest Service to assess its effectiveness in moving toward stated management goals and provides a forum for adaptive management. The 2006 Forest Plan may be amended or revised to adapt to new information and changed conditions identified through monitoring and evaluation.

The purpose of the Monitoring Guide is to identify specific items that respond to the programmatic monitoring items described in Tables 4.1-3 through 4.1-7of the Forest Plan. The Monitoring Guide provides a menu of monitoring activities from which Forest Service staff may select the methods used to collect and analyze data. In addition, it describes the purpose, locations, cooperators, and estimated costs. Each year, an interdisciplinary team will review the monitoring items and the monitoring questions and will work to develop a monitoring schedule for the upcoming year that takes into account available budgets. Specific components of each item in the Guide include:

Monitoring Item Name: Descriptive name for the monitoring item.

Monitoring Question/Detailed Monitoring Question: What questions will the monitoring attempt to answer?

LRMP (Forest Plan) Tables Addressed: The table reference(s) in Chapter 4 of the Forest Plan that this monitoring item addresses.

LRMP Reference: The objectives, standards, or guidelines in the Forest Plan that this monitoring item addresses.

LRMP Rationale/Driver: Provides the purpose of monitoring for achieving Forest Plan objectives or desired future conditions.

Indicator and Measure: Specific data needed, usually expressed in the form of measurable or quantifiable units (i.e.: miles of trail, acres of harvest, etc.)

Data Collection Method: The specific techniques are described. The sampling technique descriptions may include the protocols being followed, unit of measure for each data element, reference values (thresholds or trigger points), spatial scale, and a description of the evaluation process.

Sample Design: Provides an example of how the data collection methods would be utilized on-the-ground.

Frequency of Measurement: Describes how often information is gathered or measured. For example, may be annually, every three-five years, or every ten years. Some resources need to be monitored annually to produce trend data. The frequency of measurement and evaluation is established in the Forest Plan, Chapter 4.

Analysis Method: Defines how the information will be analyzed.

Last Year Accomplished: Describes the Fiscal year the data collection was last collected.

Fiscal Year Scheduled: Describes the next Fiscal year the data will be collected.

Reporting Frequency: Defines how often the information is analyzed and reported. Depending upon the question being answered, analysis of the information may occur at longer time intervals than the frequency of monitoring.

Cost for year scheduled: Dollar value cost to complete the monitoring during the next year scheduled. These estimates are for direct costs of retrieval or collection of data. Estimates do not include administrative overhead or other similar indirect costs (unless otherwise noted).

Cost for decade: Dollar value cost to complete the monitoring during the decade. These estimates are for direct costs of retrieval or collection of data. Estimates do not include administrative overhead, supervision, contract preparation, or other similar indirect costs (unless otherwise noted).

Cost Explanation: Explanation of the expenses associated with the monitoring item. This may also include dialogue about funding sources and any other comments related to financing the monitoring item.

Cooperators: Who is involved in the data collection, processing, and analysis? These may include Forest Service and non-Forest Service personnel.

1.1.6 Using the Monitoring and Evaluation Guide

The Monitoring and Evaluation Guide will serve several purposes including:

- Aid in planning monitoring budgets by allowing for out-year scheduling (which is particularly useful for items with data collection intervals of 2, 3, or 5 years)
- Store and assist in prioritization of monitoring items used to generate the Annual Monitoring Plan
- Provide framework for generating Annual Monitoring and Evaluation Reports that will be integrated into five-year Comprehensive Reports

1.1.7 Annual Monitoring and Evaluation Report

Developed by an interdisciplinary team working with the Forest Supervisor, the Annual Monitoring and Evaluation Report summarizes the results of monitoring, evaluates monitoring activities, and evaluates information collected in relationship to plan implementation . Over time, the monitoring information will help the Forest Service determine whether the observed changes on the Forest are consistent with Forest Plan desired future conditions, goals, and objectives and what adjustments may be needed. The Forest Supervisor uses this information either to certify the Forest Plan as sufficient for management in the coming year, or to decide that the Plan needs to be amended.

Key questions to be addressed through monitoring and evaluation are:

- Are standards and management direction being followed?
- How well are objectives of the Forest Plan being achieved?
- Do management prescriptions respond to issues, concerns, and opportunities?
- Are effects of Forest Plan implementation occurring as predicted?
- Is the Forest progressing toward its long-term goals?
- Is the monitoring activity working as designed and providing the desired information?
- Are there opportunities to share information (partnerships)?

In summary, the Annual Monitoring and Evaluation Report:

- Reviews the results of monitoring activities during the preceding year
- Assesses the effectiveness of management practices in achieving goals, objectives, and desired conditions (outcomes) specified in the Forest Plan
- Compares the actual outputs, services, and costs with those estimated in the Forest Plan
- Evaluates the data for indicators of trends or effects
- Identifies a need to amend or revise the Forest Plan
- Identifies research needed by the National Forest System

This Annual Monitoring and Evaluation Report may provide summaries of data collected, but is primarily written to display evaluation of the data, conclusions, and recommendations. Comparison of subsequent monitoring and evaluation reports provides a means to track management effectiveness over time and to show the changes that have been made or are still needed.

Chapter 2 Monitoring Items Summary Report

Resource Name	*Monitoring Item*	*Priority (5=High,1=Low)*	*Estimated Cost ($)*
Air	Air Particulate	4	12,000
Aquatic Ecosystems	Fish and aquatic organism passage	3	3,000
Aquatic Ecosystems	Fish habitat and stream channel stability	5	12,000
Aquatic Habitat	Sedimentation/substrate embeddedness	3	3,000
Aquatic Habitat	Water temperature in streams	2	3,000
Aquatic Population - Streams	Atlantic Salmon Restoration - salmon productivity and habitat quality	4	8,000
Fire	Fire Agreements	3	0
Fire	Fire Prevention	4	250
Fire	Hazardous Fuels	3	500
Fire	Prescribed Fire	4	1,000
Fire	Wildland Fire Use	4	1,000
Forest Health	How is tree health changing over time?	5	20,000
Forest Health	Increase of Destructive Insects and Diseases	3	2,000
Forest Health	Measurement of Oak Growth with the Escarpment	3	1,000
Heritage	Heritage Resource Program Objectives	2	350
Heritage	Heritage Resource S&Gs	3	2,000
Heritage	Heritage Resource Site Protection	3	5,000
Human Dimensions	Contract sizes to local economies	2	1,000
Human Dimensions	Coordination with other agencies, organizations,and groups	2	2,000
Human Dimensions	County income by employment sector	3	500
Human Dimensions	Forestry Education Sites	4	1,000
Human Dimensions	Partnerships Maintenance and Enhancement	3	1,000
Human Dimensions	Payments to towns	2	100
Human Dimensions	Teacher professional development in Forest stewardship	3	100
Invasive Species Population	Non-native invasive species	4	5,000
Lands	Land Ownership Adjustment	2	0
Lands	Special Uses - Lands	3	1,200

Resource Name	Monitoring Item	Priority (5=High,1=Low)	Estimated Cost ($)
Program Management	Costs of Plan Implementation	4	1,000
Program Management	Desired Future Condition	5	2,500
Program Management	Innovative, Coordinated Management and Energy Conservation	4	2,000
Program Management	Outputs Accomplished - Other Resources	4	2,000
Program Management	Standards & Guidelines Compliance	4	1,000
Program Management	Standards and Guidelines - Implementation and Effectiveness Monitoring	4	15,000
Rare Plants Population	Ginseng Population Trends	3	3,000
Rare Plants Population	RFSS Plant Population Trends	4	4,000
Recreation	Catamount Trail Designation	3	1,500
Recreation	Comprehensive Trail Planning	4	1,500
Recreation	Effects of vehicle use off roads	3	1,000
Recreation	Recreation Facility Maintenance	4	6,000
Recreation	Recreation Visitor Satisfaction	2	74,000
Recreation	ROS settings	3	2,000
Recreation	Scenic Integrity Objectives (SIO's)	2	0
Recreation	Special Uses - Recreation	3	1,200
Recreation	Trail maintenance	4	11,000
Recreation	Trends in trail partnerships	4	1,000
Recreation	Visual Quality Objectives (VQO's)	4	4,000
Soils	Long Term Soil Quality and Soil Productivity Monitoring	4	60,000
Soils	Soil and Water S&G, Mitigation Measure, and Soil Quality Standard Compliance	3	6,000
Terrestrial Ecological Units	Ecological Type Mapping and Representation	3	1,000
Terrestrial Wildlife Habitat	Deer Wintering Areas	4	2,500
Terrestrial Wildlife Habitat	Early Successional Habitat	5	2,500
Terrestrial Wildlife Habitat	MIS Habitat Trends	5	1,000
Terrestrial Wildlife Habitat	Wildlife Reserve Trees	3	2,000
Terrestrial Wildlife Population	Bald Eagle	2	0
Terrestrial Wildlife Population	Bicknell's Thrush	3	1,000
Terrestrial Wildlife Population	Common Loon	2	500

Resource Name	Monitoring Item	Priority (5=High,1=Low)	Estimated Cost ($)
Terrestrial Wildlife Population	MIS Population Trends	5	6,000
Terrestrial Wildlife Population	Peregrine Falcon	2	2,500
Terrestrial Wildlife Population	RFSS Odonates and Lepidopterans	2	5,000
Terrestrial Wildlife Population	TES Bats	5	5,000
Terrestrial Wildlife Population	TES Herptiles (wood turtle, Jefferson and blue-spotted salamanders)	3	500
Terrestrial Wildlife Population	TES Mammals (wolf, cougar, lynx)	2	0
Terrestrial Wildlife Population	Wildlife in Remote Areas	3	2,500
Vegetation	Age Class Distribution within lands where even-aged management is allowed	4	300
Vegetation	Aspen-Birch & Early Successional Habitat	5	
Vegetation	Conversion of hardwoods to mixedwood and softwoods	3	
Vegetation	Forest-wide Habitat Composition (landscape scale)	4	1,000
Vegetation	Late-successional forest	3	4,000
Vegetation	Oak and Oak-Pine Forest Maintenance and Restoration	5	300
Vegetation	Oak Regeneration	5	300
Vegetation	Outputs Accomplished - Volume and Acres of Timber Offered and Sold	5	500
Vegetation	Permanent Upland Openings	5	
Vegetation	Rare or Outstanding Natural Areas	3	5,000
Vegetation	Regeneration Harvest Opening Size	3	4,000
Vegetation	Shelterwood with Reserves	4	500
Vegetation	Stocking Level	3	1,000
Vegetation	Suited Timber Lands	3	10,000
Vegetation	Sustainability of Special Forest Product Gathering	3	500
Vegetation	Trends in Vegetative Community Composition (site-level scale)	5	20,000
Vegetation	Uneven-aged Management	3	300
Water	Forest-wide Water Quality Monitoring	3	15,600
Wild & Scenic Rivers	Wild and Scenic Rivers	2	1,000
Wilderness	Wilderness Areas Managed to Standard	4	100,000
Wilderness	Wilderness Character: Natural (Human Threats)	3	7,000

Resource Name	Monitoring Item	Priority (5=High,1=Low)	Estimated Cost ($)
Wilderness	Wilderness Character: Natural -Biophysical Conditions	3	1,000
Wilderness	Wilderness Character: Primitive Recreation	3	1,000
Wilderness	Wilderness Character: Solitude	4	1,000
Wilderness	Wilderness Character: Unconfined Recreation	3	1,000
Wilderness	Wilderness Character: Undeveloped - Inholdings	3	1,000
Wilderness	Wilderness Character: Undeveloped - Motorized and Mechanical Transport	4	5,000
Wilderness	Wilderness Character: Undeveloped - Permanent Improvements	4	6,000
Wilderness	Wilderness Character: Untrammelled	4	1,000
Wilderness	Wilderness Field Presence	3	7,000
Wilderness	Wilderness Study Areas	3	1,000

Chapter 3 Resource Monitoring Direction

Monitoring Item Name: Air Particulate

Item Reference # 94

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☑	☐	☐	☐	☐

LRMP Reference: Goal 5: Maintain or improve air quality on the GMNF.

LRMP Rationale/Driver: Required by the Forest Plan - it meets all three objectives under Goal 5.

Indicator & Measure: Elements and compounds (type and amount) present in the particulate matter.

Data Collection Method: The FS is only responsible for weekly collection & replacement of a set of air filters at the IMPROVE site, and sending the filters of the UC-Davis Laboratory. The protocols for work the FS is responsible for are spelled out in an EPA publication kept by the FS site operator.

Sample Design: Our IMPOVE site is one of about 50 sites nation-wide. The same particulate data is collected at each IMPROVE site. Air particulate samples are collected on a weekly basis.

Frequency of Measurement: Weekly

Analysis Method: Analyses are the responsibility of the EPA. We are not familiar with these methods.

Last Year Accomplished: **Cost for Year Scheduled:** $12,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $120,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs are to collect air filters at the site, plus a small building (rented from the Carthusian Foundation), and the building electricity. All other costs are covered by EPA.

Cooperators:

Monitoring Item Name:	Fish and aquatic organism passage
Item Reference # 31	
Monitoring Question	To what extent have Standards and Guidelines been applied?
Detailed Monitoring Question:	Are culvert rehabitation projects resulting in improved fish passage at stream crossings? Are road construction and maintenance activities resulting in improved or replaced culverts designed to water and debris, and allow free movement of resident aquatic life?
LRMP Tables Addressed:	LRMP 4.1-3 ☑ LRMP 4.1-4 ☐ LRMP 4.1-5 ☑ LRMP 4.1-6 ☐ LRMP 4.1-7 ☑
LRMP Reference:	S&Gs 2.3.8 - Fisheries
LRMP Rationale/Driver:	Existing culvert that are migration barriers to fish and other aquatic organisms will be removed or rehabilitated to pass aquatic organisms as maintenance schedules and funding permits. New, permanent stream crossing will be design to pass higher bankful flows, debris and native aquatic organisms. FP Objective: Minimize the adverse impacts on aquatic, fisheries, riparian, vernal pool, and wetland resources from management activities.
Indicator & Measure:	Indicator - fish passage barrier based on survey findings, coarse filter analysis and passage criteria. Measure - miles of streams habitat restored
Data Collection Method:	Culvert Survey (Physical habitat and conditions in and around the pipe). Electorfishing survey for fish population estimates and fish tagging studies.
Sample Design:	Weekly sampling during fish spawning seasons, generally in the fall but could happen in spring as well.
Frequency of Measurement:	Annually
Analysis Method:	Coarse filter analysis and evaluation criteria for specific species; mark and recapture methods for tagged fish.
Last Year Accomplished:	2005 **Cost for Year Scheduled:** $3,000
Fiscal Year Scheduled:	2007 **Cost Per Decade:** $30,000
Reporting Frequency:	5 Years
Estimated Cost - Explanation:	fish passage monitoring would not occur every year but would likely be performed in 3-4 year blocks over the next decade or more.
Cooperators:	VTDEC VDFW USFWS Watershed groups

Monitoring Item Name: Fish habitat and stream channel stability

Item Reference # 29

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

Detailed Monitoring Question: How are fish habitat and stream channels changing over time. This monitoring documents physical characteristic and geomorphic attributes of streams for a range stream monitoring categories to include MIS, habitat restoration, and Forest Management and Recreation as well as trends in reference and unmanaged areas. This monitoring will also compare measurements both before and after stream restoration projects to determine if they are resulting in increased habitat quality as identifed in Goals 4 and 6 of the Forest Plan.

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☑	☑	☑	☑	☑

LRMP Reference: Goal 6: Maintain or restore ecological processes and systems on the GMNF within desired ranges of variability, including a variety of native vegetation and stream channel types, and their patterns and structural components.

LRMP Rationale/Driver: Level III stream monitoring provides a science based, highly repeatable method to evaluate channel changes over time that may be the result of mangement activities as well as being able to detect natural changes and variability of channel including Forest-wide trends over time.

FP Objective:
Minimize the adverse impacts on aquatic, fisheries, riparian, vernal pool, and wetland resources from management activities.

Indicator & Measure: Indicator - fish habitat diversity, complexity and channel stability,
Measures - pool:riffle ratio and habitat composition, LWD quantities, Bankfull and channel dimensions, profiles, planform (sinuosity, entrenchment, etc), substrate size distribution, miles of fish habitat or stream channel restored.

Data Collection Method: Geomorphic Assessment Protocols For Vermont streams including Level III stream survey method and Hankin:Reeves Basin-wide habitat survey. Also, draft national aquatic monitoring protocols as appropriate.

Sample Design: There are approximately 40 long-term fish habitat and stream channel monitoring sites throughout the Forest. Each site will be done about every 5 years or 8 site per year.

Frequency of Measurement: Annually

Analysis Method: Use data calculations and graphics to detemine changes in stream feature and attributes from previous monitroing efforts.

Last Year Accomplished: 2005 **Cost for Year Scheduled:** $12,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $120,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: $12,000 per year. Condcut monitoring every year but reprot every 5 years. Funding from NFIM or NFWF.

Cooperators: Vermont Dept. of Environmental Conservation - River Mgt Division
White River Partnership
Batten Kill Watershed Alliance
USFWS

Monitoring Item Name: Sedimentation/substrate embeddedness

Item Reference # 30

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: Are substrate embeddedness and sedimentation levels within the range described in the Forest Plan and providing high quality spawning and rearing habitat for native fish species and macroinvertebrates.

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☑	☐	☑	☑	☑

LRMP Reference: Goal 4: Maintain or restore aquatic, fisheries, riparian, and wetland habitats.

LRMP Rationale/Driver: Substrate embeddedness or sedimentation monitoring provide a quantitative measure from which fish spawing and rearing habitat can be measured and assessed and tracked over time for trends. Low embeddedness and sedimentation provide high quality habitat for native fish species and aquatic macroinvertebrates in stream ecosystems.

FP Objective:
Restore and enhance fisheries habitat using principles of stream geomorphology and habitat management to provide:
• Less than 50 percent substrate embeddedness in spawning and rearing areas, primarily riffle and run habitats
• Less than 20 percent fine sediment, sand, and silt in spawning areas
• At least 30 percent pool habitat, of which at least one third should be Class 1 and 2 holding and resting pools
• No more than 15 percent of stream bank area eroded on the entire length of stream.

Indicator & Measure: Indicator - Substrate embeddedness in fish spawning and rearing habitat.

Measure - less than 50% in riffle/run habitats; less than 20% in spawning gravel areas.

Data Collection Method: Whitlock-Vibert box method for fine sediment monitoring in spawning areas.
Hankin-Reeves Basin Wide Habitat survey for embeddedness monitoring in riffle/run habitats.

Sample Design: Whitlock-Vibert box method would be done at selected stream spawning sites as needed to detect changes in sediment levels. This is usually done over a period of years in order to detect changes (eg before, during and after monitoring of a timber sale to determine effects on stream spawning habitat.
Hankin Reeves survey would have the same sampling strategy and frequency as the Whitlock Vibert box method.

Frequency of Measurement: Annually

Analysis Method: Whitlock-Vibert box method - boxes are removed from the stream substrate, and contents are dried, and sieved according to standard scientific protocols to determine fine sediment accumulation.

Hankin-Reeves habitat survey - embeddedness is measure by ramdomly selecting substrate particles along a transect across a riffle or run habitat unit. The portion of the particle that was embedded into the stream bottome is assess as a percent of embeddedness. This is repeated multiple times in each habitat unit to derive at a average embeddedness figure.

Last Year Accomplished:	2004	**Cost for Year Scheduled:**	$3,000
Fiscal Year Scheduled:	2009	**Cost Per Decade:**	$18,000
Reporting Frequency:	5 Years		

Estimated Cost - Explanation: Esimated that this monitoring will be done twice for 3 consecutive years each during the next decade.

Cooperators: USFS NE Research Station
Watershed Groups

Monitoring Item Name: Water temperature in streams

Item Reference # 28

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

Detailed Monitoring Question: Are summer water temperatures in upland streams suitable to maintain native fish species and have they changed over the planning period? Monitoring will help determine if we are maintaining or improving water temperature regimes for native, cold-water fish species. Stream temperature affects not only a species population but also commuity composition. These monitoring data help determine an aspect of water and habitat quality and where temperature may be too high and riaprian and stream habitat restoration could be conducted.

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☑	☐	☐	☐	☑

LRMP Reference: Goal 4: Maintain or restore aquatic, fisheries, riparian, and wetland habitats.

LRMP Rationale/Driver: Monitor water temperature in upland streams to assure they are being maintained to support native fish species and macroinvertebrate communities.

FP Objectives: Meet or exceed all State Water Quality Standards, including biotic standards. Restore and improve aquatic, riparian, fisheries, and wetland resources.

Indicator & Measure: Indicator - Average daily maximum temperature from last week of May through the last week of October.
Measure - Number of days during the monitoring period exceeding an average daily max. temperature of 70 degrees Fahrenheit.

Data Collection Method: Collect stream temperature data using On-set Temperature Loggers. Repeat sites for monitoring if necessary.

Sample Design: Depending on stream size and length, deploy numerous temp. loggers at specified locations including the confluence with key tributaries and where land use change (e.g. forest riparian area to open meadows or pastures).

Frequency of Measurement: Annually

Analysis Method: Computerized software program allows all temperature measurements taken during the sampling period to be downloaded. Data is then displayed on a spreadsheet identifying any water temperatures that exceed the threshold measurement.

Last Year Accomplished:	2005	**Cost for Year Scheduled:**	$3,000
Fiscal Year Scheduled:	2007	**Cost Per Decade:**	$30,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: $3,000 per year. Conduct sampling every year but report every 5 years. Funded by NFIM or NFWF

Cooperators:

Monitoring Item Name: Atlantic Salmon Restoration - salmon productivity and habitat quality

Item Reference # 27

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☑	☐	☐	☐	☐

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: This monitoring of juvenile salmon populations in historic salmon streams on the GMNF tracks populations in individual streams as well as trends Forest-wide over the over-term. It is important we monitor salmon populations and habitat for resource protection and restoration purposes but also because the GMNF is a cooperator in the inter-state, inter-agency samon restoration program in the connecticut River Basin,

FP Objectives: Increase Atlantic salmon populations in streams through stocking and spawning activities, in cooperation with the Connecticut River Atlantic Salmon Commission, as identified in the Strategic Plan for the Restoration of Atlantic Salmon to the Connecticut River Basin. Maintain or enhance fish populations through habitat protection, enhancement, and restoration, and stocking programs.

Indicator & Measure: Indicatior - juvenile salmon abundance
Measure - number of salmon parr per unit (100 sq meters) of habitat; and number smolts per stream

Data Collection Method: Salmon abundance will be estimated using a multiple pass depletion method (modified Zippen method). Backpack and canoe electrofishers will be used to collect salmon from streams. Block nets are used to isolate the fish from other portions of the stream and fish are temporarily held in cages after each pass through the electrofishing site. Standard statistical software will be used to provide estimates of salmon parr & smolt abundance and density.

Sample Design: Two or three pass sampling would be done at all stream sites.

Frequency of Measurement: Annually

Analysis Method: Standard Statistical software to obtain a wide range of statistical paraments such as 95 % confidence limits for population estimates, standard deviation, etc

Last Year Accomplished:	2005	**Cost for Year Scheduled:**	$8,000
Fiscal Year Scheduled:	2007	**Cost Per Decade:**	$80,000

Reporting Frequency: Annually

Estimated Cost - Explanation: $8,000 per year NFWF and NFLM

Cooperators: USFWS, VDFW

Monitoring Item Name: Fire Agreements

Item Reference # 89

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 21: Protect human life, property, and facilities from wildland fire hazards.

LRMP Rationale/Driver: Objective 2 - Develop and maintain agreements with outside partners to increase effectiveness and efficiencies

Indicator & Measure: # of agreements established annually
longevity of agreements with each entity

Data Collection Method: Iweb database can be queried for formal agreements; also FMO will tally

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $0

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $0

Reporting Frequency: Annually

Estimated Cost - Explanation: costs are included in Fire Prevention item

Cooperators:

Monitoring Item Name: Fire Prevention

Item Reference # 87

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 21: Protect human life, property, and facilities from wildland fire hazards.

LRMP Rationale/Driver: Particularly Objective 1 - provide an appropriate management response to all wildland fire

Also Fire Management S&Gs

Indicator & Measure: Number of wildfires suppressed with no reportable accidents/injuries or damage to private property. Number of acres of private property burned from fires with ignition on Forest Service land.

Data Collection Method: data is gathered by fire managers and stored in the National Fire Report Database

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $250

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $2,500

Reporting Frequency: Annually

Estimated Cost - Explanation: cost is anticipated to be $250/year to compile and report data

Cooperators:

Monitoring Item Name: Hazardous Fuels

Item Reference # 88

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 21: Protect human life, property, and facilities from wildland fire hazards.

LRMP Rationale/Driver: Objective 3: Reduce hazardous fuels through fire use, mechanical treatments, and harvest treatments.

Also Fire Management S&Gs, Guidelines 1-4

Indicator & Measure: number of acres treated for hazardous fuels reduction

Data Collection Method: Acres treated are tallied by Fire Program and reported nationally

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished:

Cost for Year Scheduled: $500

Fiscal Year Scheduled: 2007

Cost Per Decade: $5,000

Reporting Frequency: Annually

Estimated Cost - Explanation:

Cooperators:

Monitoring Item Name: Prescribed Fire

Item Reference # 86

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 6: Maintain or restore ecological processes and systems on the GMNF within desired ranges of variability, including a variety of native vegetation and stream channel types, and their patterns and structural components.

LRMP Rationale/Driver: Objectives 2 & 3; also Goal 2 maintaining habitat for viable populations of species, particularly with early successional and upland opening habitats, and with oak-pine habitat. This monitoring will help managers determine if prescribed burns are providing the results expected.

Also Fire management S&Gs (all of them)

Indicator & Measure: vegetation, soils, fuels characteristics - TBD

Data Collection Method: Priority is for monitoring understory burns. Use FIREMON (www.fire.org) FIREMON (fire Effects Monitoring and Inventory System) is a comprehensive monitoring system designed to satisfy fire management agency monitoring requirements. FIREMON includes components and instructions enabling field personnel to design a monitoring project, conduct field sampling and store and analyze their fire effects and other monitoring data.

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: reporting may also be tied to burning frequency.
1 week/ burn of GS-6 level dependant on size and complexity of burn units and ecological objectives; possibly completed through cooperation with The Nature Conservancy partners

Cooperators: The Nature Conservancy

Monitoring Item Name: Wildland Fire Use

Item Reference # 90

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

Detailed Monitoring Question: Do wildland fires managed using Wildland Fire Use successfully meet objectives set forth in the Forest Plan and the Fire Management Plan? Did the fire stay within the allowed management areas and 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?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: S&Gs 2.3.10 - Fire management

LRMP Rationale/Driver: Standards 1 and 2, and G-2

Indicator & Measure: vegetation, soils, fuels characteristics - TBD

Data Collection Method: Priority is for monitoring wildland fire use fires, and areas where wildland fire use is likely to occur. Wildland fires may also be monitored to answer the above questions. Use FIREMON (www.fire.org) FIREMON (fire Effects Monitoring and Inventory System) is a comprehensive monitoring system designed to satisfy fire management agency monitoring requirements. FIREMON includes components and instructions enabling field personnel to design a monitoring project, conduct field sampling and store and analyze their fire effects and other monitoring data.

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Dependant on the frequency of occurrence and size of the wildland fire; it is not clear if wildlife fires will occur within an area with a WFU plan every year - it may be less frequent. Would cost $1,000/year (funded by NFIM) when needed.

Cooperators: The Nature Conservancy

Monitoring Item Name: How is tree health changing over time?

Item Reference # 51

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

Detailed Monitoring Question: How is tree health changing over time from the influence of acid deposition, climate change, invasive species and other environmental problems, in combination and separate from land management practices? Is this affecting the longevity of long-lived tree species and their ability to produce high quality wood products on long rotations?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 8: Provide for a sustainable supply of forest products.

LRMP Rationale/Driver: EO 11991 Protection and Enhancement of Environmental Quality

FP Objective:
Provide high-quality sawtimber and other wood products for local economies.

Also Goal 2 objective related to use of long rotations, and the Diverse Backcountry and Remote Wildlife MA guidelines for use of long rotations.

Indicator & Measure: Indicator: Tree Health
Measures: Biomass productivity; Incremental growth; Tree survival; tee decline (foliage density, dieback, crown density)

Data Collection Method: Sample design is presently a work in progress.

Sample Design: The Long Term Ecosystem Monitoring (LTEM) Project will address some (but not all) of the tree health monitoring needs. The LTEM project will establish approximately 40 plots (FIA National Core Field Guide) where tree health information will be gathered on a long terms basis.

Frequency of Measurement: 5 Years

Analysis Method: Using Forest Inventory and Analysis (FIA) protocals sampling plots will be established at strategic (yet to be determined) sites through out the Forest. For sampling tree health - 15 foot radius plots. Data analyses will be similar to those done under the National Forest Health Monitoring program.

Last Year Accomplished: **Cost for Year Scheduled:** $20,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $70,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: This monitoring item is part of the Long Term Ecosystem Monitoring (LTEM) Project. Total LTEM estimated project cost to establish 40 plots over the next 3 years is $300,000. Of this total, the cost of collecting the baseline tree health data is $60,000 ($20,000/year for 3 years). The cost of one remeasurement in the 5th year is $10,000. Thus the total decade cost is $70,000.

Cooperators:

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Monitoring Item Name: Increase of Destructive Insects and Diseases

Item Reference # 60

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☑	☐	☐	☐	☐

LRMP Reference: S&Gs 2.3.9 - Forest health and disturbance processes

LRMP Rationale/Driver: This monitoring helps track trends in insect and disease activity. It can be used to determine when management action should take place.

Indicator & Measure:

Data Collection Method: Record the number of outbreaks (and acres affected) for each insect and disease organism (quantitative). Unless "damaging levels" have been concretly defined, a quantitive assessment of supression will be made. S&PF Forest Health Protection conducts an annual aerial detection survey. Hotspots are mapped while in the air and later followed up with a ground survey, truthing the identification of the organism causing the damage. They also summarize these efforts in an annual report that can be used as a source for the Forest monitoring report.

Sample Design: Number of outbreaks
Acres affected
Species of insects and diseases

Frequency of Measurement: Annually

Analysis Method: The analysis is conducted by S&PF - Forest Health Protection. If warrented, a biological assessment will be conducted to recommend treatment strategies.

Last Year Accomplished: **Cost for Year Scheduled:** $2,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $20,000

Reporting Frequency: Annually

Estimated Cost - Explanation: S&PF funds the cost of the aerial detection survey. Costs are shown for routine reporting. If a problem occurs, protocols will have to be developed for the specfic situation and costs identified for more intensive surveys.

Cooperators: State & Private Forestry - Durham, NH

Monitoring Item Name: Measurement of Oak Growth with the Escarpment

Item Reference # 56

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

Detailed Monitoring Question: What effect has gypsy moth defoliation caused overtime to the growth and productivity of the oak timber resource in the Escarpment Management Area.

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: S&Gs 2.3.9 - Forest health and disturbance processes

LRMP Rationale/Driver: A series of 20 1/10th acre square plots were established by S&PF-Forest Health Protection and the GMNF on April 3, 1991. The purpose was to monitor the effectiveness of Bt spraying to protect oaks and measure growth overtime. The plots were re-measured on March 18, 1996 and July 30, 2001.

Indicator & Measure: The indicators is crown transpiracy and 5 year growth of dominant and co-dominant oak trees.

Data Collection Method: The overstory trees have been tagged with a driven wire and attached numbered alumium tag. DBH measurements have been the only measurements taken since 1991. Foliage transparency measurements were taken in 1991 during the gypsy moth defoliation.

Sample Design: A series of twenty 1/10 acre square plots were established by S&PF - Forest Health Protection on Chandler Ridge - Middlebury RD.

Frequency of Measurement: 5 Years

Analysis Method: Analysis of the remeasurement data was conducted by the Forest Silviculturist with assistance from entomologist from S&PF - Forest Health Protection.

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $2,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: The measurements will require 1 person day and 1 person day or less for analysis.

Cooperators: S&PF - Forest Health Protection

Monitoring Item Name: Heritage Resource Program Objectives

Item Reference # 49

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: Have Heritage Resource Program Management Objectives related to backlogged site evaluations, meeting curation guidelines, developing a GIS model for prehistoric site locations, increasing partnerships for Section 110 activities, consulting with SHPO and Tribes, and incorporating Heritage components into historic building management plans been addressed?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 16: Provide protection and stewardship for significant heritage resources on the GMNF.

LRMP Rationale/Driver: Legal: National Historic Preservation Act, Archaeological Resources Protection Act, & Native American Graves Protection and Repatriation Act; S&G 2.3.14 - Tribal, and 2.3.15 - Heritage; Goal 16 - Objectives 1, 3, 4, 5, 6, 7

Indicator & Measure:
Indicator 1: Previously inventoried sites evaluated against NRHP criteria
Measure 1: % of previously inventoried sites evaluated this FY, & cumulatively
Indicator 2: Curation facilities for artifacts & archives meeting CFR 79 standards
Measure 2: % of collections in condition and facilities meeting CFR 79
Indicator 3: Successful integration of VT SHPO GIS model for location of prehistoric archaeological sites into the GMNF Heritage toolbox.
Measure 3: Y/N
Indicator 4: Increase partnerships to assist with NHPA Section 110 activities
Measure 4: # and ratio of Partnerships with formal documentation, compared to FY06
Indicator 5: Consultation with SHPO and Tribes
Measure 5: # of contacts/consults with SHPO and individual Tribes in FY
Indicator 6: Heritage Resource values as component of Facilities Mgt Plans
Measure 6: % of Facility Mgt Plans with a Heritage Resource component completed in FY and cumulatively

Data Collection Method:
Indicator 1: review I-Web Heritage data to track number of sites that were evaluated for NRHP eligibility during the year, and compare to the backlog of unevaluated sites.
Indicator 2: direct observation of collections and curation facility
Indicator 3: review HRR reports to see if predictive model has been used.
Indicator 4: count formal partnerships and compare to previous years
Indicator 5: develop log of consultations.
Indicator 6: count number of facility management plans that have Heritage Resource components.

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $350

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $4,100

Reporting Frequency: 5 Years

Estimated Cost - Explanation: requires 1 day of Archaeologist; plus 1 day at year 5 and 10 for reporting.

Cooperators:

Monitoring Item Name: Heritage Resource S&Gs

Item Reference # 47

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: Have Heritage Resource sites within the Areas of Potential Effect of Forest-sponsored projects (undertakings) been protected and managed according to our Standards and Guidelines?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 16: Provide protection and stewardship for significant heritage resources on the GMNF.

LRMP Rationale/Driver: Legal: National Historic Preservation Act, Archaeological Resources Protection Act, and Native American Graves Protection and Repatriation Act; S&G 2.3.14 - Tribal, and 2.3.15 - Heritage; Goal 16 - Objectives 2 & 5

Indicator & Measure: Indicator 1: Implementation of S&Gs within projects' Areas of Potential Effect.
Indicator 2: Effectiveness of S&G implementation based on Changed Conditions
Measure 1: Mitigation Measures/Design Elements implemented (Y/N or %)
Measure 2: % of sites within APE with significant Changed Condition due to lack of S&G implementation

Data Collection Method: Each Forest undertaking/project includes an inventory of Heritage Resource sites, and protective mitigation measures or project design elements which are intended to protect these sites. The inventory records for these historic properties include descriptive condition reports and sketch maps or images. These serve as the control or baseline for evaluating changes in condition. Field observation and investigation indicates the nature, cause and extent of changed conditions (if any).

Sample Design: It would be most useful to conduct project-level S&G monitoring in an integrated manner with other Resource Specialists and project proponents. I propose doing one timber, one rec and one engineering project per year.

Frequency of Measurement: Annually

Analysis Method: Case-by-case determination of (a) whether S&Gs implemented; (b) effective; and (c) the cause (if any) of Changed Condition(s) for Heritage sites (validation).

Last Year Accomplished: **Cost for Year Scheduled:** $2,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $20,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Based on a sample size of monitoring three Forest-sponsored projects per year (1 each from Timber, Rec, Eng), and an estimate of two days of the Forest Archaeologist's time for each project to do pre-work, field visit and analyis, the total is 6 GS-11 days per year -- or about $2000

Cooperators:

Monitoring Item Name: Heritage Resource Site Protection

Item Reference # 48

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 16: Provide protection and stewardship for significant heritage resources on the GMNF.

LRMP Rationale/Driver: Legal: National Historic Preservation Act, Archaeological Resources Protection Act, & Native American Graves Protection and Repatriation Act; S&G 2.3.14 - Tribal, and 2.3.15 - Heritage; Goal 16 - Objectives 2, 4 & 5.

Indicator & Measure: Indicator: Changed Condition of Heritage Resource site, such that its information value and/or eligibility to the National Register has been compromised.
Measure: % of monitored sites with significant Changed Condition

Data Collection Method: Comparison of Condition description in inventoried Heritage Resource site database to the current condition leads to a Changed Condition determination.

Sample Design: Our sample size (e.g., # of compartments and #sites) is entirely budget-driven. The location of our sample is derived through a combination of knowledge gaps (places where we know very little), opportunity, and corporate need (i.e., doing I&M in places where we anticipate future Forest activies). We would desire a target sample of 5% of our inventory per year.

Frequency of Measurement: Annually

Analysis Method: Case-by-case determination of the cause (if any) of Changed Condition for a Heritage site.

Last Year Accomplished: **Cost for Year Scheduled:** $5,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $50,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Estimate of $50 per site monitoring/evaluation; 5% of inventory per year = 100+ sites. Thus $50x100 = $5000 per year.

Cooperators:

Monitoring Item Name: Contract sizes to local economies

Item Reference # 33

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: What is the range of dollar amounts and board feet in contracts? Who has been awarded the contract?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 17: Support regional and local economies through resource use, production, and protections.

LRMP Rationale/Driver: Vary the range of project sizes for contracts.

Indicator & Measure: Number of contracts awarded for ranges of board feet and monetary values, and location of contractor.

Number of board feet from GMNF processed at local mills.

Data Collection Method: use contracting information - need to develop protocol - possibly in conjunction with partners.

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method: data will evaluate the level to which we are providing a range of contract sizes and the level to which the timber contracts are supporting local economies.

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2010 **Cost Per Decade:** $2,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: estimate that data collection and analysis will take 3 days

Cooperators: Univ of Vermont, NEResearch, VFPA, state of Vermont

Monitoring Item Name: Coordination with other agencies, organizations,and groups

Item Reference # 64

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: Has the FS improved communication and collaboration with federal and State agencies, regional commissions, town governments, and other local organizations?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 20: Coordinate Forest planning and implementation with federal, State, and local agencies.

LRMP Rationale/Driver: Objective 1: Improve communication and collaboration with federal and State agencies, regional commissions, town governments, and other local organizations.

Indicator & Measure: narrative describing coordination and collaboration that has occurred among Forest Service staff and other entities and an evaluation of its effectiveness.

Feedback request forms.

Data Collection Method: Query FS staff for narrative responses.

Query agencies, organizations, and groups for feedback

Sample Design:

Frequency of Measurement: Triannually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $2,000

Fiscal Year Scheduled: 2009 **Cost Per Decade:** $6,000

Reporting Frequency: Triannually

Estimated Cost - Explanation: Every program area would need to write a narrative and identify what agencies, organizations, and groups should provide feedback. Forest Planner would compile, organize, and assess (1-2 days)

Cooperators:

Category: Human Dimensions — Monitoring Direction

Monitoring Item Name: County income by employment sector

Item Reference # 32

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: To what extent is the GMNF contributing to the economic health of local economies?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☑	☐	☑	☐

LRMP Reference: Goal 17: Support regional and local economies through resource use, production, and protections.

LRMP Rationale/Driver: Work with communities in community development to enhance social capital and economic baseline.
Increase coordination with communities and local businesses to enhance the GMNF's economic contribution.

Indicator & Measure: Bureau of Economic Analysis Regional Economic Accounts Local Area Personel Income related to Forest Activites - see Table 3.21.19 FEIS page 3-377

Data Collection Method: data is available on the BEA website is collected annually by BEA.

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method: This information when adjusted for current dollars can give a picture of the economic health of the counties with FS lands. We have the baseline established in the FEIS.

Last Year Accomplished: **Cost for Year Scheduled:** $500

Fiscal Year Scheduled: 2010 **Cost Per Decade:** $1,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: cost would include a 1.5 days of work

Cooperators: University or Vermont, Center for Rural Development

Monitoring Item Name: Forestry Education Sites

Item Reference # 61

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: Were sites established on the Forest for forestry education?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 19: Provide a diverse range of information and education opportunities that will enhance the understanding of the GMNF.

LRMP Rationale/Driver: Objective 4: Establish two sites, one on the North Half of the Forest and one on the South Half of the Forest, for demonstration forests, discovery trails, or plots and other living laboratories for teacher/non-formal educator use.

Objective 1: Expand internal and external public awareness of Forest Service management.

Indicator & Measure: Number of sites established for demonstration forests, discovery trails, or plots and other living laboratories.

Number of visitors at site.

Data Collection Method: Every 5 years, report on what sites have been established.

The number of visitors would be collected through sign-in sheets and number of attendance at Forest Service-led public tours.

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2011 **Cost Per Decade:** $2,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Estimate 1-3 days of staff time to collect data and compile

Cooperators:

Monitoring Item Name: Partnerships Maintenance and Enhancement

Item Reference # 63

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 18: Maintain and enhance partnerships with communities and organizations.

LRMP Rationale/Driver: Objectives 1 through 4:

Increase the effective use of partnerships to achieve Forest goals.

Increase coordination with other federal, State, county, and local agencies and the private sector in the prevention, control, containment, and monitoring of non-native invasive species.

Establish, maintain, or enhance partnerships with community organizations for resource planning.

Work with communities in community development to enhance social capital and economic baseline.

Indicator & Measure: Number of formal partnership agreements (inter-agency, Challenge Cost Share, Memorandums of Understanding).

Number of FS staff participating in outside organizations in offical capacity (representing FS interest).

Evaluation (narrative) of how the partnership has been effective in helping the Forest Service meet Goals and Objectives.

Number of people hours contributed by partnerships.

Data Collection Method: Gather data from formal partnership agreements on Iweb.

Query FS staff on partnership participation and number of people hours contributed by partnerships, and narrative on effectiveness.

Sample Design:

Frequency of Measurement: Biannually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2008 **Cost Per Decade:** $5,000

Reporting Frequency: Biannually

Estimated Cost - Explanation: Cumulative 3 days of time for all staff members.

Cooperators:

Monitoring Item Name: Payments to towns

Item Reference # 76

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☑	☐	☐	☑	☐

LRMP Reference: Goal 17: Support regional and local economies through resource use, production, and protections.

LRMP Rationale/Driver: Maintain communications with Forest communities with regard to Payment in Lieu of Taxes, 25 Percent Fund, and/or Secure Schools and Community Self-Determination Act.

Indicator & Measure: Amount of payment to each town in each category, contacts made with towns about these programs.

Data Collection Method: Dollar amounts reported to GMNF annually. Contacts could be part of satisfaction survey with towns or reported by FS staff.

Sample Design:

Frequency of Measurement: Annually

Analysis Method: tracking of cponsistency in payment levels to determine effect of NFS ownership on town financial health.

Last Year Accomplished: **Cost for Year Scheduled:** $100

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $1,000

Reporting Frequency: Annually

Estimated Cost - Explanation: This would take a couple hours of staff time.

Cooperators:

Monitoring Item Name: Teacher professional development in Forest stewardship

Item Reference # 62

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 19: Provide a diverse range of information and education opportunities that will enhance the understanding of the GMNF.

LRMP Rationale/Driver: Objective 3: Include teacher development in stewardship of living systems in the educational outreach program.

Indicator & Measure: Number of teachers trained.

Number of programs offered.

Data Collection Method: A report is filed annually with cooperating government agencies (including the RO). The monitoring data is included in the report.

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $100

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $1,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Costs = less than one day's time per year.

Cooperators:

Monitoring Item Name: Non-native invasive species

Item Reference # 78

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: Non-native invasive species are one of what the FS chief sees as the top four threats to National Forest lands; Goal 2, Objective 6; effectiveness of standards and guidelines for Pests, Diseases, and Non-Native Invasive Species: S1 through S4 and G1 through G-5

Indicator & Measure: Indicator: Extent of infestations
Measures: Acres and/or priority sites surveyed; acres and/or priority sites infested; acres and/or priority sites treated; acres and/or priority sites with infestations reduced in size

Data Collection Method: During the growing season, trained FS staff and volunteers record GPS coordinates in combination w/ net infestation and canopy cover to estimate NNIS net infestations. Sites surveyed are either those we most want to protect or those that have the greatest potential to be sources of seeds or plant propagules for places we most want to protect. Monitoring of known infestations is in locations where we want to determine invasiveness or where we want to know the results of treatment efforts.

Sample Design: There is not a statistical component to the sample design. Sites monitored are those fitting the criteria described in "Data Collection Method". Monitoring will occur annually, but not in the same places.

Frequency of Measurement: Annually

Analysis Method: Compare acres or sites infested over time. No statistical measures have been used.

Last Year Accomplished: **Cost for Year Scheduled:** $5,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $50,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Currently all funds are directed toward either small-scale Early Detection Rapid Response or completing Forest-wide environmental analyses for NNIS control. The above costs per year and per decade would allow us to monitor the results of these efforts, enter the data, and evaluate it. This amount would also allow us to monitor the effectiveness of standards and guidelines for NNIS and to inventory new sites (thus monitoring the impact of NNIS on other Forest resources).

Cooperators: Volunteers currently help w/ site inventories

Monitoring Item Name: Land Ownership Adjustment

Item Reference # 79

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 22: Meet anticipated future needs and opportunities on public lands and improve management effectiveness of the National Forest through adjustment of land ownership.

LRMP Rationale/Driver:

Indicator & Measure: Indicator: Acres adjusted
Measures: # of acres

Data Collection Method: Number of acres adjusted

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $0

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $0

Reporting Frequency: Annually

Estimated Cost - Explanation: The Forest has to report acres adjusted to the RO on a yearly basis.

Cooperators:

Monitoring Item Name: Special Uses - Lands

Item Reference # 91

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 1: Provide for a wide range of uses and activities in an ecologically, socially, and economically sustainable way.

LRMP Rationale/Driver: National direction in the directives system as captured in Plan Standards and Guidelines.

Indicator & Measure: Percentage of authorizations administered to standard annually.

Data Collection Method: After a review of the authorization, a field inspection of the authorized use is conducted. Inspections are documented in the case file and the Iweb SUDS database.

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,200

Fiscal Year Scheduled: 2011 **Cost Per Decade:** $2,400

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Funding is 3 days of Resource Assistant time and 2 days of program manager's time at 5 and 10 years.

Cooperators: For certain types of permits, other Federal, State or local agencies may have some responsibilities.

Monitoring Item Name: Costs of Plan Implementation

Item Reference # 82

Monitoring Question How close are actual costs to projected costs?

Detailed Monitoring Question: To what extent is the Forest providing a mix of products, services and amenities? This monitoring compares the level of expected socioeconomic outputs with actual levels. It also compares actual and estimated costs by program area. These comparisons are required by the Forest plan.

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☑	☐	☐	☐

LRMP Reference: Goal 1: Provide for a wide range of uses and activities in an ecologically, socially, and economically sustainable way.

LRMP Rationale/Driver: Required by Forest Plan outputs table; will identify trends and draw conclusions about the adequacy of the amount of goods, services, and amenities provided and whether or not the levels have had any adverse socioeconomic impacts within the forest region.

Indicator & Measure: GMNF Annual Budget and Expenditures by Program; GMNF Expenditures to produce items in App D. Proposed and Probable practices.

Data Collection Method: data will be collected through program managers.

Sample Design:

Frequency of Measurement: Annually

Analysis Method: The 2006 forest Plan did not estimate the costs of specific activities with the exception of the cost of producing board feet. The socio-economic section assumed the cost of all programs will remain the same except the need to increase timber program costs to produce more timber. Realistically we need to know the cost of outputs for each program. We need to establish a baseline of costs per output for programs based on current funding levels. We then need to monitor future costs per output to determine trands and ineffeciencies.

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2008 **Cost Per Decade:** $10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: estimate 3 staff days to collect and analyze data per year

Cooperators:

Monitoring Item Name: Desired Future Condition

Item Reference # 93

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

Detailed Monitoring Question: What activities have occurred in management areas. How have these management areas 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.

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 1: Provide for a wide range of uses and activities in an ecologically, socially, and economically sustainable way.

LRMP Rationale/Driver: This item provides a comprehensive approach to monitoring activities in management areas and the activities effect on reaching the desired future condition. It will also provide the FS with information needed for Wo information call on roadless, wilderness, HFRA.

Indicator & Measure: number of acres, number of miles, with location of projects and discription of activity

Data Collection Method: FACTS, NEPA documents, INFRA

Sample Design:

Frequency of Measurement: Annually

Analysis Method: This information will bew used to determine if the activites we are doing are consistent with the specified management of an area. Used with other monitoring data this data will provide the information needed to evaluate how well we are doing at meeting desired future conditions and temporally, tabulary and spatially tracking plan implementation activities.

Last Year Accomplished: **Cost for Year Scheduled:** $2,500

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $25,000

Reporting Frequency: Annually

Estimated Cost - Explanation: this assumes 7 staff days to determine and enter all forest projects with description and exact locations.

Cooperators:

Monitoring Item Name: Innovative, Coordinated Management and Energy Conservation

Item Reference # 85

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: How many projects have been completed or undertaken that demonstrate innovative management practice, coordinated vegetation management as a tool to accomplish other resource objectives, and how the Forest is reducing the amount of energy used through conservation and use of renewable energy sources

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 9: Demonstrate innovative, scientifically, and ecologically sound management practices that can be applied to other lands.

LRMP Rationale/Driver: Also Goal 10 and 11, and all associated objectives. This is linked to some extent to monitoring item associated with demonstration forestry under Goal 19.

Indicator & Measure: What projects have been done and how well did they demonstrate innovation, coordination, and energy conservation?

Number of projects completed
Number of projects underway
Narrative on how each project demonstrates innovation, coordination, and/or energy conservation

Data Collection Method: query program coordinators and ask for numbers of projects that meet this item with a narrative for each project describing how it addresses Goals 9, 10, and 11.

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method:

Last Year Accomplished:

Cost for Year Scheduled: $2,000

Fiscal Year Scheduled: 2011

Cost Per Decade: $4,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Every program area would need to write a narrative and identify what projects address monitoring item. Forest Planner would compile, organize, and assess (1-2 days)

Cooperators:

Monitoring Item Name: Outputs Accomplished - Other Resources

Item Reference # 80

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☑	☐	☐	☐

LRMP Reference: Goal 1: Provide for a wide range of uses and activities in an ecologically, socially, and economically sustainable way.

LRMP Rationale/Driver: This addresses NFMA requirements to report on outputs; this output item has been separated from timber output items as they are separated in Appendix D and the timber items address a specific goal (8)

Indicator & Measure: amounts per Table D-5

Data Collection Method: Query program coordinators and specialists to report on amounts associated with each resource area identified in Table D-5

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $2,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $20,000

Reporting Frequency: Annually

Estimated Cost - Explanation: estimate approximately 5 days of GS-11 ($300/day) to query, report information, and set up in table

Cooperators:

Monitoring Item Name: Standards & Guidelines Compliance

Item Reference # 83

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

Detailed Monitoring Question: Did any project require guideline modification or a Forest Plan amendment to modify a standard? If so, what was the project? Which standard or guideline was changed? And What was the rationale for the change?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 9: Demonstrate innovative, scientifically, and ecologically sound management practices that can be applied to other lands.

LRMP Rationale/Driver: No specific goal related to this but is required in Plan and Goal 9 seemed a good fit. This will help us evaluate the effectiveness of S&Gs

Indicator & Measure: # S&Gs modified or changed annually, tallied by standard or guideline, tallied by project, and tallied by resource area

Data Collection Method: The project leaders on every project will need to tally the S&Gs that were modified for that project and the rationale. NEPA coordinators will need to tally any projects where amendments were required to change a standard. Will need to develop a spreadsheet or database to store this information.

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $4,000

Reporting Frequency: Annually

Estimated Cost - Explanation: estimate 2 days in 07 to develop system to store the information, and then 1 day to query and compile information annually ($300/day)

Cooperators:

Monitoring Item Name: Standards and Guidelines - Implementation and Effectiveness Monitoring

Item Reference # 84

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 9: Demonstrate innovative, scientifically, and ecologically sound management practices that can be applied to other lands.

LRMP Rationale/Driver: All combined S&Gs are part of this, although Goal 9 also seems a good fit; required by Forest Plan and NFMA; also addresses monitoring item 3 in Table 4.1-6.

Indicator & Measure: A tally of S&Gs applicable to the project, those being applied, those not being applied or being mis-applied, and those that are not effective. Ratings or scorings TBD

Data Collection Method: select a set of projects annually that will be evaluated for this monitoring; IDTs will visit these projects as teams as identify S&Gs and mitigation measures that are being implemented, those that are effective, and those that are not being implemented or are not effective. Recommendations will be made regarding changes needed, including plan amendments to change S&G direction

Sample Design: select at least 1 large and 1 small project annually
select at least 2 projects annually
select a variety of types of projects across the years to ensure all S&Gs that have been used are evaluated

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $15,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $150,000

Reporting Frequency: Annually

Estimated Cost - Explanation: For two projects/year, estimate 2 coordinators for 20 days, and 10 specialists for 3 days each, @ $300/day, for a total of 50 days and $15,000. Every additional project will add about 15 days or $4500.

Cooperators:

Monitoring Item Name: Ginseng Population Trends

Item Reference # 26

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

Detailed Monitoring Question: what are the trends in ginseng plant size and distribution/occurrence on NFS lands?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: related also to objective of Goal 8 to provide sustainable opportunities to harvest special forest products, since ginseng is threatened most by gathering

Indicator & Measure: # of populations on Forest and their distribution
# of individuals, by leaf-number size classes, in each population
# of flowering and fruiting individuals in each population

Data Collection Method: Monitor 10 known populations every 3-5 years (based on Gagnon 1999); data gathered will be a subset of Gagnon 1999, including leaf-number size class, numbers in fruit, numbers in flower, during first week of August. A schedule for populations will be developed.

Sample Design: All populations and individuals will be assessed

Frequency of Measurement: Triannually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $3,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $12,000

Reporting Frequency: Triannually

Estimated Cost - Explanation: monitor all populations in one year and do every 3 years (2 pop's/day for 10 days plus 2 days data entry & field organization @ $300/day) for $3,600 every 3 years or 4x/decade (including first and 10th yr) or $14,400 for the decade. Costs can be reduced to $3,000 per sampling year or to $12,000 per decade by getting a contractor to do the sampling for $2,000-2,500.

Cooperators: possibly USFWS if our populations can be lumped in with VT populations in a larger regional study

Monitoring Item Name: RFSS Plant Population Trends

Item Reference # 23

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: Required by ESA and NFMA; all objectives under the TES section of Goal 2; monitoring this item will determine the extent to RFSS populations are changing over time, possibly in response to our management actions; this is also related to S&Gs for Rare and Unique Biological Features, TES, S1-S2 and G1-G3, as well as S&Gs for Jacob's Ladder (S-1)

Indicator & Measure: # of individuals; # flowering/in fruit; area of populations; ranked condition of populations

RFSS plants with conservation assessments or plans, and number of conservation actions or site-specific prescriptions implemented

Data Collection Method: Use NHP protocols to gather data - gather data on phenology, reproductivity, areal extent, numbers of genets/ramets, site conditions, and use NHP protocols to rank A-D populations; approximately 100 sites for RFSS plants, monitor every 5 years, meaning 20 sites monitored annually, on average accomplish two sites/day.
Record conservation plans and actions completed and implemented

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $4,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $40,000

Reporting Frequency: Annually

Estimated Cost - Explanation: 20 sites to monitor/year, two/day, means 10 days for field surveys plus 2 days for data entry or about $3600 annually; cost can be reduced by $1500 annually by using volunteers to monitor half the sites , but not until sites have all been GPS'd or otherwise marked. Cost could be reduced $3000 annually of we can get a contract for $2,000-$2500 annually for this.

Cooperators:

Monitoring Item Name: Catamount Trail Designation

Item Reference # 72

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: Is the Forest making progress on the designation of the Catamount Trail?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 12: Provide a diverse range of high-quality, sustainable recreation opportunities that complement those provided off National Forest System lands.

LRMP Rationale/Driver: Goal 12 Objective: Complete construction and designation of remaining sections of the Catamount Ski Trail within the GMNF in cooperation with the Catamount Trail Association.

Indicator & Measure: Indicator: Designated trail on the Forest trail system
Measure: Percent of the trail that has been completed and designated in the Forest Transportation Atlas (tabular and spatial).

Data Collection Method: Minimal data collection will be needed for this item and will only involve retrieval of data from existing sources. Monitoring is to measure progress on data clean-up and trail designation. Retrieval of data will be done annually to check progress.

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,500

Fiscal Year Scheduled: 2011 **Cost Per Decade:** $3,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Costs are for coordination with GIS and others to retrieve information to determine status of completion. Rec Program Manager 1 day at $350. GIS coordinator 1 day at $280 per day. Rec planner 1 day at $280 per day. Total annual needs about $1000. Evaluation at 5 and 10 years will be approximately $500 for each time. Rec Program Manager 1 day, GIS 1 day.

Cooperators:

Monitoring Item Name: Comprehensive Trail Planning

Item Reference # 73

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: To what extent has the Forest completed comprehensive trail planning for the GMNF?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 12: Provide a diverse range of high-quality, sustainable recreation opportunities that complement those provided off National Forest System lands.

LRMP Rationale/Driver: Goal 12 Objective: Complete comprehensive trail planning

Indicator & Measure: Indicator: Travel analysis completed
Measures: Per cent of GMNF completed and trends.

Data Collection Method: Protocol to be developed. In a simple form this would involve manual collection of projects or areas where travel analysis occurred. We can probably develop a simple method to track these for annual and periodic reports.

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,500

Fiscal Year Scheduled: 2011 **Cost Per Decade:** $3,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Costs will be for coordination and retrieval of data from people involved in travel analyses. Rec Program manager 1 day for $350. Rec Planner 1 day for $280 and NEPA/Engineering 1 day for $300. Total annual needs about $1000. Evaluation at 5 and 10 years. Rec Program Manager 1 day at $350 and rec planner/GIS at $ 280. About $500 at 5 year and $500 at 10 year.

Cooperators:

Monitoring Item Name: Effects of vehicle use off roads

Item Reference # 69

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☑	☐	☐	☐	☐

LRMP Reference: Goal 12: Provide a diverse range of high-quality, sustainable recreation opportunities that complement those provided off National Forest System lands.

LRMP Rationale/Driver: Regulatory requirement (36 CFR 295). Focus is primarily on wheeled motorized vehicles.

Indicator & Measure: Indicator: Trend in illegal use of motor vehicles off roads.
Measures: Percent change in law enforcement incidents and violations.

Data Collection Method: Data is collected using established procedures already being used by law enforcement personnel. As incidents and violations are noted, LEI personnel record information, including geographic data which can be retrieved later.

Sample Design: Normally collection will be random and occurs with regular patrols.

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Includes minimal costs to coordinate with LEI personnel and analyze data for annual reporting. About $1000 per year to coordinate data retrieval and analyze data. Rec Program Manager and rec planner 1-2 days each.

Cooperators:

Monitoring Item Name: Recreation Facility Maintenance

Item Reference # 71

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 12: Provide a diverse range of high-quality, sustainable recreation opportunities that complement those provided off National Forest System lands.

LRMP Rationale/Driver: Goal 12: Objective: Increase the number of developed recreation sites that are operated and maintained to standard.
Goal 12: Objective: Reduce total deferred maintainance on GMNF developed recreation facilities.

Indicator & Measure: Indicator: Facilities/sites managed to standard
Measures: Percent managed to standard and trends

Data Collection Method: Field condition inventories of recreation sites and facilities and data entered into I-WEB. We will use standard protocols for this type of facility.

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $6,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $62,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: The majority of costs are to complete annual condition invetories that will be used to develop the Facility Condition Index. 20 Days of GS-7 for data collection. 10 days data entry at GS-9. 1 day of analysis annually. An additional $1000 will be needed at 5 and 10 years for more detailed evaluation.

Cooperators:

Monitoring Item Name: Recreation Visitor Satisfaction

Item Reference # 74

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 12: Provide a diverse range of high-quality, sustainable recreation opportunities that complement those provided off National Forest System lands.

LRMP Rationale/Driver: Goal 12 Various objectives. Determine if the tasks we are completing to bring facilities to standard are meeting expectations of the public.

Indicator & Measure: Visitor satisfaction from NVUM
Measure: Mean Visitor satisfaction compared to Mean importance to visitor
.

Data Collection Method: Follow national sampling procedures that are developed for each individual sample year. Samples for each National Forest occur on a five year rotating cycle.

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $74,000

Fiscal Year Scheduled: 2010 **Cost Per Decade:** $150,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Costs involve analysis and evaluation of NVUM data for the GMFL. FY 2005 survey costs of about 106,000, with about 70% from the GMNF and 30 % for the FLNF. About $1000 per year for evaluation of data. (1-2 days each for Rec Program Manager and rec planner.

Cooperators:

Monitoring Item Name: ROS settings

Item Reference # 67

Monitoring Question To what extent are ROS settings being provided?

Detailed Monitoring Question: Is the Forest moving toward the desired future condition for ROS settings? This monitoring compares inventoried ROS settings at the time of Forest Plan revision with the inventory after 5 and 10 years of plan implementation.

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 12: Provide a diverse range of high-quality, sustainable recreation opportunities that complement those provided off National Forest System lands.

LRMP Rationale/Driver:

Indicator & Measure: Indicator: Recreation opportunity settings
Measures: Trends toward desired future condition

Data Collection Method: This will involve completion of mapping using established protocols.

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $2,000

Fiscal Year Scheduled: 2011 **Cost Per Decade:** $5,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Costs are for staff time to complete revised inventory using computer techiques. Five days for GIS coordinator at $290 per day for $1450. One day of analysis for recreation planner at $270 per day equals $270. One day coordination and analysis for Rec program manager at $350 per day. Total needs about $2000.00.

Cooperators:

Monitoring Item Name: Scenic Integrity Objectives (SIO's)

Item Reference # 35

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☐

LRMP Reference: Goal 15: Maintain or enhance visual resources such as viewsheds, vistas, overlooks, and special features.

LRMP Rationale/Driver: Objective under Goal 15: Complete a transition from the current Visual Management System to the Scenery Management System.

Indicator & Measure: Percent of Forest with Scenic Integrity Objectves.

Data Collection Method: After Amendment to Forest Plan is complete we can say that this item has been accomplshed. We are not monitoring for quality of transition from one system to another, just for accomplishment.

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $0

Fiscal Year Scheduled: 2012 **Cost Per Decade:** $0

Reporting Frequency: 5 Years

Estimated Cost - Explanation: There would be a nominal cost to determine if the Forest actually made the transition from the current Visual Mgt System to the Scenery Mgt System.

Cooperators:

Monitoring Item Name: Special Uses - Recreation

Item Reference # 92

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: Is the Forest helping to provide a diverse range of high-quality, sustainable recreation opportunities by improving its administration of existing authorizations?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 12: Provide a diverse range of high-quality, sustainable recreation opportunities that complement those provided off National Forest System lands.

LRMP Rationale/Driver: National direction in the directives system as captured in Plan Standards and Guidelines.

Indicator & Measure: Percentage of authorizations administered to standard annually.

Data Collection Method: After a review of the authorization, a field inspection of the authorized use is conducted. Inspections are documented in the case file and the Iweb SUDS database.

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,200

Fiscal Year Scheduled: 2011 **Cost Per Decade:** $2,400

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Funding is 3 days of Resource Assistant time and 2 days of program manager's time at 5 and 10 years.

Cooperators:

Monitoring Item Name: Trail maintenance

Item Reference # 68

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 12: Provide a diverse range of high-quality, sustainable recreation opportunities that complement those provided off National Forest System lands.

LRMP Rationale/Driver: Goal 12, Objective: Reduce total deferred maintenance on the GMNF trail system.
Goal 12, Objective: Increase the number of miles that are operated and mainained to standard.

Indicator & Measure: Indicator: Total deferred maintenance for Forest trail system
Measures: Total deferred maintenance divided by total system trail miles for the Forest

Data Collection Method: Data will be gathered using trail condition survey protocols in place at the time of survey. It is assumed that the Forest will do approximately 10% of the trail system per year or about 80 miles per year.

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $11,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $112,340

Reporting Frequency: 5 Years

Estimated Cost - Explanation: 40 days for GS-5 for data collection = $5000, 15 days for data entry for GS-9 = $3800, 5 days for rec planner for cooridination and preparation = $1400 and then 1 day for GS-12 for analysis =$350. Total needs = $11000. Evaluation at 5 and 10 years - 1 day for Rec program manager and 1 day for Rec planner at $270 = $620 for each evaluation. For decade = 1240

Cooperators:

Monitoring Item Name: Trends in trail partnerships

Item Reference # 70

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 12: Provide a diverse range of high-quality, sustainable recreation opportunities that complement those provided off National Forest System lands.

LRMP Rationale/Driver: Goal 12 Objective: Increase the effective use of partnerships in the improvement, maintenance and operation of the Forest Trails System. The Forest has a large trail system with significant deferred maintenance. The annual trails budget covers only about 10% of calculated operations and maintenance for the existing system but the public continues to pressure for more new trails. The justification given for adding new trails to the system is that the partners will provide the maintenance. Though we have strong partners, we don't come close to covering total trail system needs. This item will provide a means to measure how well partner contribututions are covering trail system operation and maintenance needs.

Indicator & Measure: Indicators: Partner contributions in trail operations and maintenance
Measure: Percent of contributions (cash and in-kind) when compared to total calculated operations and maintenance needs.

Data Collection Method: Data is collected through the completion of agreements and regular condition inventory sampling for the trail system.

Sample Design:

Frequency of Measurement: Biannually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2008 **Cost Per Decade:** $5,000

Reporting Frequency: Biannually

Estimated Cost - Explanation: Costs for trail condition surveys are covered under a separate monitoring item. Annual costs are to cover retrieval and analysis of information. One day each for the Rec program coordinator and Program Facilitator (Operations) $350 plus 330 = about $1000. 5 and 10 year evaluations. One day for rec program cooridinator 350 taken twice = about $1000

Cooperators:

Monitoring Item Name: Visual Quality Objectives (VQO's)

Item Reference # 34

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: S&Gs 2.3.13 - Visuals

LRMP Rationale/Driver: Goal 15: Maintain or enhance visual resources such as viewsheds, vistas, overlooks, and special features.
Objective: Maintain or enhance visual quality of special areas that contain scenic features. Maintain or enhance visual quality on the Forest.

Indicator & Measure: # of projects or sites sampled that do not meet VQO's.
Design criteria, mitigation and standards and guidelines applied on the ground will be looked at in conjunction with the overall project implementation to determine if the VQO's were met or not met. If not met, what could have been done to achieve VQO and/or what could be done toward meeting VQO?

Data Collection Method: Project reviews. Visually inspect a sample of implemented projects, identifying applied S&G's, design criteria and general project design for effectiveness in meeting or not meeting the VQO's.

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $4,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $40,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Landscape Architect field / office time - 10 Days

Cooperators:

Monitoring Item Name: Long Term Soil Quality and Soil Productivity Monitoring

Item Reference # 53

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

Detailed Monitoring Question: 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?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☑	☐	☐	☐	☐

LRMP Reference: Goal 3: Maintain or restore the natural, ecological functions of the soil.

LRMP Rationale/Driver: CFR 219.27a.1, and the Multiple-Use Sustained-Yield Act (June 12, 1960) require that we maintain the long term productivity of the land. "Land productivity" has been defined by the Forest Service to mean site or soil productivity. Soil/site productivity is typically measured by the FS in terms of volume or weight produced/unit/acre/year (see Forest Plan, p.156, definition of Soil Productivity). Potenital indicators of change in soil producitivity have also been developed by the research community. These indicators will be tracked via tree health and annual increment growth.

Indicator & Measure:
Indicator: Soil quality
Measures: Soil nutrient levels and toxins by major horizon.
Indicator: Soil productivity
Measures: Forest Health - NOTE that all information (monitoring justification, protocols, methods, and costs) regarding the soil productivity measures resides in the monitoring item with the Resource Keyword: Forest Health, and the Monitoring Item Name: How is tree health changing over time?
Indicator: Soil climate
Measures: Soil temperature and moisture, depth of freezing, correlated with selected meterological parameters

Data Collection Method: Described in the draft protocols for the existing Long Term Soil Monitoring Project, lead by the VT Monitoring Cooperative (VMC). Protocols follow standard NRCS soil description and sampling procedures. Methods of soil (biomass) productivity monitoring are covered in the Forest Health (Resource Keyword) monitoring item with a detailed monitoring question of: "How is tree health changing over time?"

Sample Design: Sample design is currently in development. Soil quality and productivity will be monitored as part of the 40-plot Long Term Ecosystem Monitoring (LTEM) Project. Plots will be located on mid-and-lower elevations, primarily in relatively undisturbed northern hardwood stands, on the major soil/geologic tyrpes on the Forest. Each LTEM plot will have one large soil pit and several smaller holes for collection of soil samples for analysis. No location in the plot will be sampled for soils more than once. We intend to eventually incorporate the two existing VMC Long Term Soil Monitoring Plots on the GMNF into the LTEM Project.

Frequency of Measurement: 5 Years

Analysis Method: Lab and data analyses to be conducted using standard NRCS methods, as adapted by the VMC Soil Team for the existing Long Term Soil Monitoring Project. Levels of nutrients and toxic element in the soil will be compared to the best available thresholds. Change will be tracked and analyzed over time.

Last Year Accomplished: **Cost for Year Scheduled:** $60,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $180,000

Reporting Frequency: 10 Years

Estimated Cost - Explanation: This monitoring item is part of the Long Term Ecosystem Monitoring (LTEM) Project. Total LTEM estimated project cost to establish 40 plots over the next 3 years is $300,000. Of this total, the cost of collecting the baseline soil information is $60,000/year for 3 years. This work will consist of collecting the soil samples, followed by lab analyses.
Note: All cost information regarding the soil productivity measures is NOT included here. Rather, it resides in the monitoring item with the Resource Keyword: Forest Health, and the Monitoring Item Name: How is tree health changing over time?

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Monitoring Item Name: Soil and Water S&G, Mitigation Measure, and Soil Quality Standard Compliance

Item Reference # 54

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

Detailed Monitoring Question: Were 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 (a FS Manual requirement)?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☑

LRMP Reference: Goal 3: Maintain or restore the natural, ecological functions of the soil.

LRMP Rationale/Driver: Both objectives for Goal 3; also Goal 4 objectives 1-4; also all Soil/water/riparian S&Gs.

NFMA requires us to monitor compliance with S&Gs. FSM2509.18-91-1 also requires to establish and monitor compliance with soil quality standards. Monitoring also helps us undertand the effects of our management practices on soil quality, soil productivity, water quality, and riparian, wetland, and aquatic characteristics.

Indicator & Measure: Indicator: S&Gs and mitigation measures
Measures: Percent of time implemented
Indicator: Soil Quality Standards (currently being developed for the Forest)
Measures: Percent of time met

Data Collection Method: For S&G and mitiation measure monitoring - Visit selected projects and record observations on a Forest standard form developed using Access. Data is a combination of quantitative and qualitative. Protocols are spelled out on the data forms. Data collection methods for Soil Quality Monitoring are in development, but they will be similar.

Sample Design: Monitoring focuses on projects with a moderate or high risk of resource damage if S&Gs and mitigation measures are not followed. Moderate or high risks are present when: soil disturbance is anticipated close to streams or wetlands; a large amount of soil disturbance is expected; steep slopes or erosive soils are present; the project is close to a potential wild or scenic river; or other specific risks identified in the EA/EIS.

Frequency of Measurement: Variable depending on the assessment of risk to the resources

Analysis Method: There are 3 types of analyses:
1. Immediate analysis to determine if corrective actions is needed in t he field, now..
2. Annual summarization of data to determine the percent of the time S&Gs, mitigation measures, and Soil Quality Standards are met. Summaries are done by: a) individual measure (e.g. the percent of the time G-10 is implemented), and b) cumulatively (e.g. percent of the time all S&Gs and mitigation measures are implemented). Important comments on the data forms are also summarized. Analysis results are included in the annual Forest M&E report.

Last Year Accomplished: **Cost for Year Scheduled:** $6,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $60,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs are primarily salaries for soil and water people to collect and summarize data.

Cooperators: Forest Management Team

Monitoring Item Name: Ecological Type Mapping and Representation

Item Reference # 21

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: 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?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 6: Maintain or restore ecological processes and systems on the GMNF within desired ranges of variability, including a variety of native vegetation and stream channel types, and their patterns and structural components.

LRMP Rationale/Driver: In order to accurately measure the objective in the revised Plan to manage at least 5% of each eco-type on the Forest for old growth characteristics, one needs to ensure that classification systems used to identify eco-types accurately represent the diversity of types and potential natural vegetation
Links to the Long-term Monitoring Plot item as monitoring organized by ecological unit will help to identify the range of natural variability of these ecosystems
Links to NFIM inventory of ecological units through landscape assessments
As new land is purchased, proportions may change and some uncommon types in the Taconics may become more prevalent on the GM and therefore less well represented in the reference area network.

Indicator & Measure: # acres and proportion of the GMNF with up-to-date ecological maps consistent with the NHFEU, including interpretations for management and potential natural vegetation
acres and proportion of ecological types within the reference area network

Data Collection Method: For representation in the reference area network, overlay maps of eco-types with updated MA maps and identify acres within reference area network (see FEIS).

For up-to-date ecomap information, query NRIS-Terra for acres inventoried that meet NHFEU standards as defined by TEUI protocol (September 2005, GTR WO-68)

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method: see TEUI Technical Guide (GTR WO-68, September 2005)

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $2,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: estimate no more than a day of a person's time to calculate each year, a little more for 5-year comprehensive, cumulatively not more than $2,000 over 10 years; $1000 cost in first year scheduled includes organizing the information and getting Terra figured out.

Cooperators:

Monitoring Item Name: Deer Wintering Areas

Item Reference # 75

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

Detailed Monitoring Question: Are S&Gs improving 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?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☑	☐	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: NFMA requirement to maintain viability (CFR 219.19);
NFMA requirements for MIS (36 CFR 219.19(a));
Goal 2, pp.10-13.

Indicator & Measure: Silvicultural measurement of stand maturity or regeneration.
Pellet or track counts to doccument use of areas.

Data Collection Method:

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished:

Cost for Year Scheduled: $2,500

Fiscal Year Scheduled: 2007

Cost Per Decade: $25,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: 10 days x $250/day

Cooperators: VFWD, VINS

Monitoring Item Name:	Early Successional Habitat
Item Reference # 11	
Monitoring Question	To what extent do Forest Service Management activities contribute toward restoration and maintenance of habitat for native and desirable non-native species?
Detailed Monitoring Question:	Are temporary & permanent openings used by ESH species? What are short- and long-term changes in structural composnents and use of openings of different sizes
LRMP Tables Addressed:	LRMP 4.1-3 ☐ LRMP 4.1-4 ☐ LRMP 4.1-5 ☐ LRMP 4.1-6 ☑ LRMP 4.1-7 ☑
LRMP Reference:	Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.
LRMP Rationale/Driver:	NFMA requirement to maintain viability (36 CFR 219.19);
Indicator & Measure:	Various: vegetation database queries, long-term site inspection and vegetative measures of permanent and temporary openings, breeding bird surveys
Data Collection Method:	Various: vegetation database queries, long-term site inspection and vegetative measures of permanent and temporary openings, breeding bird surveys
Sample Design:	
Frequency of Measurement:	5 Years
Analysis Method:	Various
Last Year Accomplished:	**Cost for Year Scheduled:** $2,500
Fiscal Year Scheduled:	2007 **Cost Per Decade:** $5,000
Reporting Frequency:	5 Years
Estimated Cost - Explanation:	cost reflects a combination of FS staff and volunteer surveys each year at selected sites. 8 days x $250/day plus $500 volunteer cost.
Cooperators:	VFWD

Monitoring Item Name:	MIS Habitat Trends
Item Reference # 10	
Monitoring Question	To what extent do Forest Service Management activities contribute toward restoration and maintenance of habitat for native and desirable non-native species?
Detailed Monitoring Question:	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?
LRMP Tables Addressed:	LRMP 4.1-3 ☐ LRMP 4.1-4 ☐ LRMP 4.1-5 ☑ LRMP 4.1-6 ☐ LRMP 4.1-7 ☐
LRMP Reference:	Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.
LRMP Rationale/Driver:	NFMA requirement to maintain viability (36 CFR 219.19); NFMA requirements for MIS (36 CFR 219.19(a)); Goal 2, pp.10-13; Monitoring & Evaluation for MIS, p.117
Indicator & Measure:	Various (species-specific); vegetation database queries
Data Collection Method:	Various (species-specific): vegetation database queries, site inspection of deer wintering areas
Sample Design:	Various (species-specific)
Frequency of Measurement:	5 Years
Analysis Method:	Various (species-specific)
Last Year Accomplished:	**Cost for Year Scheduled:** $1,000
Fiscal Year Scheduled:	2007 **Cost Per Decade:** $2,000
Reporting Frequency:	5 Years
Estimated Cost - Explanation:	estimated 4 days of database queries and analysis of data at $250/day
Cooperators:	VFWD, NWF, VINS

Monitoring Item Name: Wildlife Reserve Trees

Item Reference # 12

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: NFMA requirement to maintain viability (36 CFR 219.19);
Goal 2 and associated Objectives , pp.10,12; Wildlife Reserve Tree S&Gs pp.27-29

Indicator & Measure: Site inspection and long-term observation of reserve trees

Data Collection Method: Various: long-term site inspection of individual reserve trees and snags

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method: Various

Last Year Accomplished: **Cost for Year Scheduled:** $2,000

Fiscal Year Scheduled: 2010 **Cost Per Decade:** $4,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: estimated 8 person days/year at $250/day in harvested stands.

Cooperators: VFWD

Monitoring Item Name: Bald Eagle

Item Reference # 1

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: NFMA requirement to maintain viability (CFR 219.19); ESA protect and conserve T&E species; Goal 2 and associated TES Objectives, pp.10-131; Den and Nest Tree G-2, p.29; TES S&Gs, pp.30-31; Bald eagle S&Gs p. 31

Indicator & Measure: Number & location of individuals, documented nests

Data Collection Method: Contact and information sharing with cooperators: USFWS, VFWD, NWF, VINS

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $0

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $0

Reporting Frequency: Annually

Estimated Cost - Explanation: Monitoring accomplished through ongoing and continuing contact and interaction with cooperators, such as USFWS, VFWD, VINS

Cooperators: USFWS, VFWD, NWF, VINS

Monitoring Item Name: Bicknell's Thrush

Item Reference # 2

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: NFMA requirement to maintain viability (CFR 219.19)
Goal 2 and associated TES Objectives, pp.10-13; TES S&Gs, pp.30-31

Indicator & Measure: Presence and number of individuals

Data Collection Method: VINS Mountain Birdwatch

Sample Design: Breeding bird survey

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Monitoring accomplished largely through ongoing and continuing contact and interaction with cooperators, such as USFWS, VFWD, VINS. 3 days/year at $250/day plus 1 day reporting at $250/day

Cooperators: VINS

Monitoring Item Name: Common Loon

Item Reference # 3

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: NFMA requirement to maintain viability (CFR 219.19)
Goal 2 and associated TES Objectives, pp.10-13; TES S&Gs, pp.30-31

Indicator & Measure: Number & location of individuals, documented nests

Data Collection Method: Contact and information sharing with cooperators: VFWD, NWF, VINS

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $500

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $5,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Monitoring accomplished largely through ongoing and continuing contact and interaction with cooperators, such as USFWS, VFWD, VINS. 2 days x $250/day

Cooperators: VFWD, NWF, VINS

Monitoring Item Name: MIS Population Trends

Item Reference # 9

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

Detailed Monitoring Question: What are population trends of MIS? To what extent are MIS responding to FS management of suitable habitat?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☑	☐	☐

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: NFMA requirement to maintain viability (36 CFR 219.19);
NFMA requirements for MIS (36 CFR 219.19(a));
Goal 2, pp.10-13; Monitoring & Evaluation for MIS, p.117

Indicator & Measure: Various (species-specific)

Data Collection Method: Various (species-specific): breeding bird survey, drumming counts, singin male counts, nest counts, pellet-browse surveys

Sample Design: Various (species-specific)

Frequency of Measurement: Annually

Analysis Method: Various (species-specific)

Last Year Accomplished: **Cost for Year Scheduled:** $6,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $60,000

Reporting Frequency: Annually

Estimated Cost - Explanation: combination of FS employees, volunteers and project coordination. 30 days x $200/day

Cooperators: VFWD

Monitoring Item Name:	Peregrine Falcon
Item Reference # 7	
Monitoring Question	To what extent are Forest Service management activities contributing toward population viability for native and desired non-native species?
Detailed Monitoring Question:	What is the population trend of peregrine falcons on the GMNF and adjacent lands?
LRMP Tables Addressed:	LRMP 4.1-3 ☐ LRMP 4.1-4 ☐ LRMP 4.1-5 ☐ LRMP 4.1-6 ☐ LRMP 4.1-7 ☑
LRMP Reference:	Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.
LRMP Rationale/Driver:	NFMA requirement to maintain viability (CFR 219.19) Goal 2 and associated TES Objectives, pp.10-13; TES S&Gs, pp.30-31
Indicator & Measure:	Presence, location, and number of individuals or reported sightings, documented nests
Data Collection Method:	Contact and information sharing with cooperators: USFWS, VFWD, NWF, VINS
Sample Design:	
Frequency of Measurement:	Annually
Analysis Method:	
Last Year Accomplished:	**Cost for Year Scheduled:** $2,500
Fiscal Year Scheduled:	2007 **Cost Per Decade:** $25,000
Reporting Frequency:	Annually
Estimated Cost - Explanation:	Monitoring accomplished primarily through ongoing and continuing contact and interaction with cooperators, such as USFWS, VFWD, NWF, VINS. 8 days/year x $250/day plus $500 volunteer cost.
Cooperators:	USFWS, VFWD, NWF, VINS

Monitoring Item Name: RFSS Odonates and Lepidopterans

Item Reference # 8

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

Detailed Monitoring Question: 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?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: NFMA requirement to maintain viability (CFR 219.19)
Goal 2 and associated TES Objectives, pp.10-13; TES S&Gs, pp.30-31

Indicator & Measure: Presence, location, and number of individuals or reported sightings

Data Collection Method: Contact and information sharing with cooperators: VINS
Dragonfly and butterfly surveys

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $5,000

Fiscal Year Scheduled: 2008 **Cost Per Decade:** $10,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: estimated contract or partnership cost

Cooperators: VINS, contractors

Monitoring Item Name: TES Bats

Item Reference # 4

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: NFMA requirement to maintain viability (CFR 219.19)
ESA protect and conserve T&E species
Goal 2, pp.10-13; Wildlife Reserve Tree S&Gs, pp.27-28; TES S&Gs, pp.30-31

Indicator & Measure: Presence, location, and number of individuals

Data Collection Method: Mist-net and acoustic sampling surveys

Sample Design: Indiana Bat Recovery Team survey and sampling protocols

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $5,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $50,000

Reporting Frequency: Annually

Estimated Cost - Explanation: cost reflects estimate 24 net nights per year average. Total annual cost for monitoring on the GMFL is $6,000. Some years all $6,000 will be done on the GM. In those years that monitoring occurs on the FL, only $5,000 will be spent on the GM.

Cooperators: USFWS, VFWD

Monitoring Item Name: TES Herptiles (wood turtle, Jefferson and blue-spotted salamanders)

Item Reference # 6

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: NFMA requirement to maintain viability (CFR 219.19)
ESA protect and conserve T&E species
Goal 2 and associated TES Objectives, pp.10-13; TES S&Gs, pp.30-31

Indicator & Measure: Presence, location, and number of individuals or reported sightings

Data Collection Method: Contact and information sharing with cooperators: Middlebury College, VINS

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $500

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $5,000

Reporting Frequency: Annually

Estimated Cost - Explanation: cost estimate us based on shared survey effort of fish team while conducting stream surveys.

Cooperators: Dr. Jim Andrews (Middlebury College); VINS

Monitoring Item Name: TES Mammals (wolf, cougar, lynx)

Item Reference # 5

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: NFMA requirement to maintain viability (CFR 219.19)
ESA protect and conserve T&E species
Goal 2 and associated TES Objectives, pp.10-13; TES S&Gs, pp.30-31

Indicator & Measure: Presence, location, and number of individuals or reported sightings

Data Collection Method: Contact and information sharing with cooperators: USFWS, VFWD, NWF, VINS

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $0

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $0

Reporting Frequency: Annually

Estimated Cost - Explanation: Monitoring accomplished through ongoing and continuing contact and interaction with cooperators, such as USFWS, VFWD, VINS

Cooperators: USFWS, VFWD, NWF, VINS

Monitoring Item Name: Wildlife in Remote Areas

Item Reference # 77

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: NFMA requirement to maintain viability (CFR 219.19);
Goal 2, pp.10-13

Indicator & Measure: Numbers or signs (tracks, nests, etc.) of individuals and species found in areas

Data Collection Method: breeding bird surveys, track counts

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method:

Last Year Accomplished:

Cost for Year Scheduled: $2,500

Fiscal Year Scheduled: 2007

Cost Per Decade: $5,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: 10 days x $250/day

Cooperators: VFWD, VINS

Monitoring Item Name: Age Class Distribution within lands where even-aged management is allowed

Item Reference # 19

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: To what extent are management actions and natural processes moving age class structure of lands managed using even-aged silvicultural systems toward desired objectives in Table 2.2-2 in the revised Plan?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: Connected to viability question in Table 7, as well as the following objectives in the Plan: Apply the following age-class objectives (Table 2.2-2) to suitable lands that will be managed using even-aged silvicultural systems to provide a variety of habitat conditions for wildlife and create a balanced distribution of age classes to meet timber objectives.
Also the following objective: Maintain a full range of age classes from young to old, including late successional and multi-age conditions, within management areas where age class can be actively manipulated toward goals, objectives, and desired future conditions

See also Mas DFU, DBF, RWH, ESC, and Moosalamoo

Indicator & Measure: # of acres and proportion of each forest type in each age class

Data Collection Method: query CDS database regarding year of origin for stands which have either had an even-aged treatment or have an even-age prescription; stand prescribers gather the data during silvexam, and silviculturists enter changes in data after activities have been implemented

Sample Design: See Silvexam handbook

Frequency of Measurement: 5 Years

Analysis Method: Comparison of current (FEIS) age class distribution to age class distribution at the time of analysis, and with the desired age class distribution in Table 2.2-2 in the revised Plan

Last Year Accomplished: **Cost for Year Scheduled:** $300

Fiscal Year Scheduled: 2009 **Cost Per Decade:** $3,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: about a day or so of someone's time to run queries and crunch numbers; over 10 years adding up to about $3000

Cooperators:

Monitoring Item Name: Aspen-Birch & Early Successional Habitat

Item Reference # 16

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: Objective: Increase acres of aspen-birch forest and regenerating forest in order to support species that prefer these habitats; this also relates to Mas where treatments are likely to occur - DFU, RWH, DBF, Esc, and Moosalamoo, as well as in parts of White Rocks

Indicator & Measure: # acres treated to maintain; # acres treated to create

Data Collection Method: of acres harvested (timber) or treated non-commercially (WL or timber), identify the number of acres that are creating or maintaining aspen-birch or early successional habitat

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method: Compare acres of existing (FEIS) aspen-birch and early successional habitat based on CDS queries to new acres created and acres maintained.

Last Year Accomplished: **Cost for Year Scheduled:**

Fiscal Year Scheduled: 2009 **Cost Per Decade:**

Reporting Frequency: 5 Years

Estimated Cost - Explanation: COST BUILT IN FORESTWIDE HABITAT COMPOSITION ITEM. estimate no more than a day of a person's time to calculate each year, a little more for the 5-year comprehensive, cumulatively not more than 3,000 over 10 years

Annual cost built into the forest-wide composition item

Cooperators:

Monitoring Item Name: Conversion of hardwoods to mixedwood and softwoods

Item Reference # 13

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: How many acres are being treated with varying management actions that will likely result in an increase in mixedwood and softwood forests on ecologically suitable sites

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: Objective: Support, and where desirable enhance, the natural coversion of northern hardwood forests to mixedwood and softwood forests on sites that ecologically support a higher proportion of softwoods; this also relates to Mas where treatments are likely to occur - DFU, RWH, DBF, Esc, and Moosalamoo

Indicator & Measure: # of acres treated to enhance softwood component or convert to softwood

Data Collection Method: Of acres harvested, identify those where the intent was to increase softwood component or convert to softwoods

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method: Compare acres of existing (FEIS) mixedwood and softwood forest based on CDS queries to new acres created due to conversion and enhancement.

Last Year Accomplished: **Cost for Year Scheduled:**

Fiscal Year Scheduled: 2009 **Cost Per Decade:**

Reporting Frequency: 5 Years

Estimated Cost - Explanation: COST BUILT IN FORESTWIDE HABITAT COMPOSITION ITEM. estimate no more than a day of a person's time to calculate each year, a little more for the 5-year comprehensive, cumulatively not more than 3,000 over 10 years

Annual cost built into the forest-wide composition item

Cooperators:

Monitoring Item Name: Forest-wide Habitat Composition (landscape scale)

Item Reference # 24

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: To what extent are management actions and natural processes moving Forest composition toward desired objectives in table 2.2-1 of the revised Plan?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: This relates to species viability in that it measures habitat suitability for various species; applicable objectives are those associated with composition under Goal 2

Indicator & Measure: number of acres and proportion in each type

Data Collection Method: Data gathered is a query of databases to determine composition at that time using forest type groups. Would want to include some comparison of the data used for FEIS vs the data being used in the year of the query - is it the same or has it been updated?

Data will be gathered annually through inventories of assessment areas; areas may not see more than one inventory in a 15-year span of time; for areas where inventories are not likely to recur within the next 15 years or areas outside the suitable timber base, inventories will be remotely based (satellites, photography, TEUI) with some field sampling, or will use previously gathered data where composition is not likely to change

Sample Design: see Silvexam handbook

Frequency of Measurement: 5 Years

Analysis Method: Comparison of current (FEIS) composition values with desired values in Table 2.2-1 of Forest Plan; comparison of data quality between that used for FEIS and that being used in the monitoring year.

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2009 **Cost Per Decade:** $2,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: about 2 days at year 5 and 10.
The $1000 per year covers some of the other composition items as well - including conversion of hardwoods to softwoods, aspen-birch and early successional, and permanent upland openings.

Cooperators:

Monitoring Item Name: Late-successional forest

Item Reference # 18

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: How many acres are there within the old forest age class, and how many acres are developing late successional forest characteristics?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: Objective: Increase acres of late-successional and old forest habitats through natural successional processes within lands not suitable for timber management, and through use of extended rotations within lands suitable for timber management; this also relates to all Mas within the Reference Area Network (Wilderness, White Rocks, WSAs, RBF, RNAs, ESAs, Alpine/Subalpine), including unsuited lands within the timber base.

Indicator & Measure: # acres within the old age class (not including aspen-birch)
acres inventoried to evaluate late successional characteristics; proportion that contain late successional characteristics
acres treated to enhance late successional characteristics

Data Collection Method: Query CDS for acres in old age class; Query activity reports for acres treated to enhance late successional characteristics. Acres inventoried can be obtained through either or both regular Silvexam inventory by adapting it to identify the indicator lichen species, or sampling a series of plots in mature or old forest age classes to monitor when late-successional characteristics start to appear

Sample Design: Sampling for late successional characteristic monitoring could be built into the long term monitoring plot project being developed, which would represent the major forest communities across the Forest; sampling design for this is being developed. Monitoring would occur every 5 years, while inventory if associated with landscape assessments could occur annually

Frequency of Measurement: 5 Years

Analysis Method: Compare acres of existing (FEIS) old forest habitat based on CDS queries to acres that have been enhanced or that have aged into the old age class.

Develop a model based on inventory and monitoring to determine the likelihood that forests of a particular type and age are developing late-successional characteristics.

Last Year Accomplished: **Cost for Year Scheduled:** $4,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $6,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: [Yr1: $4,000; Yr6: $1,000; Yr11: $1,000;] estimate about $3000 to train field crew to gather LS indicators data on plots in yr 1; estimate about $1000 contributed to the LT monitoring plot effort to gather LS indicator data; data is gathered every 5 years so there are 3 occurrences of this data gathering for about $3000.

Cooperators:

Monitoring Item Name: Oak and Oak-Pine Forest Maintenance and Restoration

Item Reference # 14

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: How many acres are being treated with varying management actions that will likely result in the maintenance and restoration of oak and oak-pine forests, and oak within oak-northern hardwood forests?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: Objective: Increase acres of oak-dominated and oak-pine forest habitat on sites that ecologically support these habitats. Maintain, and where ecologically feasible increase, the oak component in oak-northern hardwood forests

Also see MA direction for the Escarpment

Indicator & Measure: # acres treated to maintain; # acres treated to restore

Data Collection Method: Of acres harvested, treated for WL, and treated with fire, calculate the acres for which the intent was to maintain and restore oak and oak-pine

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method: Compare acres of existing (FEIS) oak, oak-pine, and northern hardwood with oak forest based on CDS queries to new acres created due to restoration, and acres maintained.

Last Year Accomplished: **Cost for Year Scheduled:** $300

Fiscal Year Scheduled: 2011 **Cost Per Decade:** $600

Reporting Frequency: 5 Years

Estimated Cost - Explanation: estimate no more than a day of a person's time to calculate each year.

Cooperators:

Monitoring Item Name: Oak Regeneration

Item Reference # 15

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: How many acres were treated to encourage oak regeneration

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☑

LRMP Reference: Goal 6: Maintain or restore ecological processes and systems on the GMNF within desired ranges of variability, including a variety of native vegetation and stream channel types, and their patterns and structural components.

LRMP Rationale/Driver: Also goal 2 - see Oak and Oak-Pine Forest Maintenance and Restoration item; Objective: Manage oak-pine natural communities on the GMNF to maintain their presence and continuity on the Forest, using natural as well as human-caused disturbance processes including fire use when necessary

Also see management direction for the Escarpment

Indicator & Measure: Acres certified as stocked with oak and oak-pine regeneration
Proportion of stands where cultural activities needed to ensure successful oak regeneration have been undertaken within the first 15-20 years of stand regeneration

Data Collection Method: Identify from the acres reported for stocking surveys those where oak regeneration has been certified to have been successful or where oak continues to be an important component of the stand

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method: Evaluate the acres treated for oak regeneration against (a) those certified as successful through stocking surveys and (b) those where cultural activities needed have also been implemented. This indicates whether we are doing what we say, and if doing these things work.

Last Year Accomplished: **Cost for Year Scheduled:** $300

Fiscal Year Scheduled: 2011 **Cost Per Decade:** $600

Reporting Frequency: 5 Years

Estimated Cost - Explanation: estimate no more than a day of a person's time to calculate each year.

Cooperators:

Monitoring Item Name: Outputs Accomplished - Volume and Acres of Timber Offered and Sold

Item Reference # 81

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☑	☐	☐	☐

LRMP Reference: Goal 8: Provide for a sustainable supply of forest products.

LRMP Rationale/Driver: To determine if timber sale outputs for the GMNF are being accomplished as outlined in Appendix D of the Forest Plan.

Indicator & Measure: Acres of even-aged regeneration harvest annually and total for the decade.
Acres of even-aged intermediate harvest annually and total for the decade.
Acres of uneven aged harvest annualy and total for the decade.
MMBF Volume of Sawtimber and Pulp offered and sold in FY and decade.

Data Collection Method: Utilize timber sale accounting reports to identify: the amount of volume offered and sold each fiscal year; acres of even-aged regeneration harvest and intermediate harvest; acres of uneven-aged harvest; and acres of total harvest.

Sample Design: None needed. Data will come directly from timber data bases.

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $500

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $5,000

Reporting Frequency: Annually

Estimated Cost - Explanation: estimate about $500/year - cost of program manager to gather data and provide to planner for incorporation into M&E report

Cooperators:

Monitoring Item Name: Permanent Upland Openings

Item Reference # 17

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: How many acres are being treated with varying management actions to maintain and increase upland opening habitats

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☑

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: Objective: Maintain, and where desirable increase, the acres of upland open habitats at slightly higher than ecological tendencies to support species that prefer these habitats; this also relates to Mas where treatments are likely to occur - DFU, RWH, DBF, Esc, and Moosalamoo, as well as parts of White Rocks, the AT, and RSAs

Indicator & Measure: # acres treated to maintain; # acres treated to create

Data Collection Method: of acres converted (timber) or treated non-commercially (WL or timber), identify the number of acres that are creating or maintaining permanent upland openings

Sample Design:

Frequency of Measurement: Annually

Analysis Method: Compare acres of existing (FEIS) upland opening habitat based on CDS queries to new acres created and acres maintained.

Last Year Accomplished: **Cost for Year Scheduled:**

Fiscal Year Scheduled: 2007 **Cost Per Decade:**

Reporting Frequency: Annually

Estimated Cost - Explanation: COST BUILT IN FORESTWIDE HABITAT COMPOSITION ITEM. estimate no more than a day of a person's time to calculate each year, a little more for the 5-year comprehensive, cumulatively not more than 3,000 over 10 years

Annual cost built into the forest-wide composition item

Cooperators:

Monitoring Item Name: Rare or Outstanding Natural Areas

Item Reference # 22

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☑

LRMP Reference: Goal 7: Protect rare or outstanding biological, ecological, or geological areas on the GMNF.

LRMP Rationale/Driver: Related to the single Goal 7 objective, as well as to viability in Table 7 as many of these areas include rare species; also related to Rare and Unique Biological Features, TEPS and rare/exemplary natural communities, S-3 and G-4; also related to Mas within Reference Area Network - Wilderness, WSA, ESA, Alpine/Subalpine, RNA, RBF, White Rocks, and unsuited lands

Indicator & Measure: # conservation actions taken to protect, maintain, or enhance these areas
Ranked condition of identified areas (A-D)
acres inventoried for rare or outstanding features (includes inventory for TES species)

Data Collection Method: Query data to determine acres inventoried. Monitor the condition of known significant sites every 5 years - place all sites on a rotation so that every year 1/5 of sites are monitored. Monitor before and after management actions occur within or adjacent to these sites

Sample Design: 61 sites (table 3.11-6 in FEIS) have a significant feature related to a natural community; this means about 12 sites/year should be monitored. Monitoring will occur via a walk-through using NHP protocols for evaluating site rank (A-D); anticipate 1 site can be monitored per day.

Frequency of Measurement: Annually

Analysis Method: Compare # of new sites found per acre inventoried to historical numbers during VNNHP surveys
Compare condition of sites when last assessed by VNNHP with condition during monitoring
Evaluate monitoring before and after actions within and adjacent to sites to determine if actions contributed to or detracted from composition, structure, and function of the sites in relation to their values

Last Year Accomplished: **Cost for Year Scheduled:** $5,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $46,000

Reporting Frequency: Annually

Estimated Cost - Explanation: estimate $1,000 in first year for setting up the data forms and database for storing this information and data analysis; expect that cost to go to about 1 day ($300) annually for a total of about $3,700 over 10 years

Cost of monitoring - 12 days field plus 2 days data entry for $300/day x 14 days or about $4200 annually. If volunteers can be found to monitor about half the sites the cost could be reduced by about $1800 annually. If we can contract the 12 sites/year for $2,000-2,500, this will bring the cost down to about $3,000 annually for the monitoring

Cooperators: VNNHP?

Monitoring Item Name: Regeneration Harvest Opening Size

Item Reference # 55

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☑	☑	☐	☐	☐

LRMP Reference: S&Gs 2.3.5 - Openings

LRMP Rationale/Driver:

Indicator & Measure: Quanitative comparisons of on-the-ground condition and Forest Plan standards. The Facts database will be queried to get stand information. Individual stand prescriptions will also be monitored through timber sale reviews

Data Collection Method: Quantitative comparisons of on-the-ground conditions and Forest plan standards. Query the FSVeg database (or FACTS or CDS if FS Veg is not available) to get stand information. Individual stand prescriptions will also be monitored through annual timber sale reviews.

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method: The data base comparsion will be made against standards.

Last Year Accomplished:

Cost for Year Scheduled: $4,000

Fiscal Year Scheduled: 2010

Cost Per Decade: $8,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation:

Cooperators:

Monitoring Item Name: Shelterwood with Reserves

Item Reference # 57

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

Detailed Monitoring Question: Can the sheltwerwood w/reserves method be used to: 1. maintain the big tree character in visually sensitive areas or to convert low quality stands to uneven-aged structure, 2. the ability to leave good qualtiy, wind-firm trees of sufficient number, size, and distribution to maintain a pleasing overstory, and 3. the ability to retain the overstory until the regenerated stand is commercially thinned in 40-60 years.

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 9: Demonstrate innovative, scientifically, and ecologically sound management practices that can be applied to other lands.

LRMP Rationale/Driver: The Campground Plot (Rochester RD) and the French Hollow Plot (Manchester RD) were establish in 1990. The plots were re-measured every 5 years and are providing long term data sets.

FP Objective:
Develop demonstration forestry project areas and areas where state-of-the-art silvicultural practices are applied.

Indicator & Measure: 1. survival and growth of overstory trees. 2. Epicormic branching response to overstory trees and 3. Regeneration response to this cutting method overtime.

Data Collection Method: 1. Approximately 30 overstory trees have been tagged and have been measured for survival, DBH growth, tree grade, epicormic branching and damage. Trees have been identified with a driven wire and aluminium numbered tag placed below stump height. 2. Approximately 10 regeneration stocking plots have been marked with plastic stakes. 1/700 acre plots have been used to sample seedlings and 1/100 acre plots have been used to sample saplings. The plot centers have been marked with white fiberglass rods with orange tips. Aluminium write-on tags have been used to number the regeneration plots. 3. Four primary corners using fiberglass boundary stakes have been established for permanent photo points

Sample Design:

Frequency of Measurement: 5 Years

Analysis Method: The forest Silviculturist will evaluate the plot data to determine if the results are meeting Forest Plan expectations. Silvicultural guidelines will be developed for its use based on monitoring results.

Last Year Accomplished:

Cost for Year Scheduled: $500

Fiscal Year Scheduled: 2008

Cost Per Decade: $1,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: The primary cost will be personnel time to actually remeasure the plots (1 person day).

Cooperators:

Monitoring Item Name: Stocking Level

Item Reference # 58

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

Detailed Monitoring Question: Are lands adequately restocked? The NFMA requires that suitable timberlands are adequately restocked following harvest. This monitoring item helps to determine if we are meeting this requirement.

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☑	☑	☐	☐	☐

LRMP Reference: S&Gs 2.3.4 - Timber or vegetation management

LRMP Rationale/Driver: Stocking Surveys (1, 3rd or 5th year).

Indicator & Measure:

Data Collection Method: The R9 FSH 2409.26b (Reforestation Handbook) is being updated. The handbook will provide protocol for stocking surveys.

Sample Design: FSH 2409.26b provides the sample design. The GMNF historically has used 1/750 acre plots through the harvested stand to determine stocking percent.

Frequency of Measurement: Annually

Analysis Method: FSH 2409.26b will provide current direction in the analysis of stocking percent. It will establish R9 standards for reforestation (stocking) levels.

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs are only for the reporting the summary results. Actual survey costs are part of the program of work which is usually funded by CWKV or NFVW/RTRT.

Cooperators:

Monitoring Item Name: Suited Timber Lands

Item Reference # 59

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

Detailed Monitoring Question: Are lands termed unsuitable for timber production adequately described and mapped?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☑	☐	☐	☐	☐

LRMP Reference: S&Gs 2.3.4 - Timber or vegetation management

LRMP Rationale/Driver: This is a NFMA legally required item. This monitoring helps identify where timber harvest can take place.

Indicator & Measure:

Data Collection Method: Record the acres of unsuitable and suitable lands inventoried.

Sample Design:

Frequency of Measurement: 10 Years

Analysis Method: The analysis will be the acres of suitable land and unsuitable lands in 2006 and 2016. A comparison will be made to determine is significant acres have changed in suitability. If significant, an ASQ analysis should be conducted and may require a Forest Plan amendment or change.

Last Year Accomplished: **Cost for Year Scheduled:** $10,000

Fiscal Year Scheduled: 2016 **Cost Per Decade:** $10,000

Reporting Frequency: 10 Years

Estimated Cost - Explanation: Data will be used from stand inventories. Costs only include the antipated analysis costs associated with using existing information. It does not include stand examination and inventory costs associated with field data collection. While stand exam will occur annually, this analysis will occur on a 10 year basis.

Cooperators:

Monitoring Item Name: Sustainability of Special Forest Product Gathering

Item Reference # 25

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 8: Provide for a sustainable supply of forest products.

LRMP Rationale/Driver: Objective: provide sustainable opportunities to harvest special forest products

Indicator & Measure:
& type of SFPs being gathered/requiring permits
permits issued/denied by SFP
& type of SFPs under evaluation

Data Collection Method: Run queries in FACTS to determine what permits have been issued for which SFPs, and what SFPs require permits; Eco-bot program to provide information on what SFPs are being evaluated; work with NRS - Marla Emery - on implementing 2002 proposal to monitor what products are being gathered on the GM.

Sample Design: see Emery proposal 2002

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $500

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $20,700

Reporting Frequency: Annually

Estimated Cost - Explanation: [Yr1:$500; Yr2:$17500; other yrs $300] In 07, simply report on FACTS queries and work with Emery on establishment of study in FY08; in FY08, initiate and complete Emery study on what is gathered on GM for $17500 (may be less costly if Marla does the research [her proposal involved hiring someone to do the interviews on GM]); remaining years involved reporting, which would amount to at most $2700, and could include some monitoring of products that may be at risk

May want to consider doing a study such as Emery's every 10 years to keep track; this study could be timed anytime within the first 5 years of Plan implementation - but we would want to report on it in the 5-year comprehensive.

Cooperators: Northern Research Station

Monitoring Item Name: Trends in Vegetative Community Composition (site-level scale)

Item Reference # 50

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

Detailed Monitoring Question: How the vegatation composition is changing over time from the influence of acid deposition, climate change, invasive species and other environmental problems, in combination and separate from land management practices.

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 6: Maintain or restore ecological processes and systems on the GMNF within desired ranges of variability, including a variety of native vegetation and stream channel types, and their patterns and structural components.

LRMP Rationale/Driver: Under a changing climate it is not going to be able to maintain the present vegetation composition especially when a climate change works in conjunction with acid deposition, invasisve species and other environmentral problems. This monitoring will be necessary to characterize and quantify changes in the vegetation on GMNF caused by the above listed environmental problems. This monitoring should focus on the schrub and herbaceous layers. The herbaceous layer will include tree seedlings until they grow above the herbaceous layer.

Indicator & Measure: Indicator: Present vegetation composition on GMNF
Measures: Vegetation in the herbaceous and shrub layers

Data Collection Method: Sample design is presently a work in progress.

Sample Design: The number of replacates has not been determined but will possibly be about 40 (FIA National Core Field Guide). The statistical analysis to be used is yet to be determined but will most likely be ANOVA or Chi Square (FIA statistical analysis protocals).

Frequency of Measurement: 5 Years

Analysis Method: Using Forest Inventory and Analysis (FIA) protocals sampling plots will be established at strategic (yet to be determined) sites through out the Forest. For sampling herbaceous plants - 1meter square quadrats; for sampling shrubs - 6.8 foot radius plots.

Last Year Accomplished: **Cost for Year Scheduled:** $20,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $70,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: This monitoring item is part of the Long Term Ecosystem Monitoring (LTEM) Project. Total LTEM estimated project cost to establish 40 plots over the next 3 years is $300,000. Of this total, the cost of collecting the baseline vegetation composition data is $60,000 ($20,000/year for 3 years). The cost of one remeasurement in the 5th year is $10,000. Thus the total decade cost is $70,000.

Cooperators:

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Monitoring Item Name: Uneven-aged Management

Item Reference # 20

Monitoring Question To what extent have Objectives been attained?

Detailed Monitoring Question: How many acres of land suitable for timber management were treated using uneven-aged silvicultural systems to create multi-age conditions, and what proportion of the annual harvest acres do these acres represent? What proportion of the lands suitable for timber management has an uneven-aged prescription?

LRMP Tables Addressed: LRMP 4.1-3 ☐ LRMP 4.1-4 ☐ LRMP 4.1-5 ☐ LRMP 4.1-6 ☑ LRMP 4.1-7 ☐

LRMP Reference: Goal 2: Maintain and restore quality, amount, and distribution of habitats to produce viable and sustainable populations of native and desirable non-native plants and animals.

LRMP Rationale/Driver: Objective: Manage a minimum of 20% of lands suitbale for timber management using uneven-age silvicultural systems to create multi-age conditions

See also Mas that allow these treatments - DFU, DBF, RWH, ESC, and Moosalamoo

Indicator & Measure: # acres and proportion of harvest acres treated with uneven-aged systems
acres with uneven-aged prescriptions

Data Collection Method: Query CDS on the number of acres within the 5 commercial Mas with uneven-aged prescriptions; query harvest acres reported at the end of each year for the number of acres harvested and acres that were harvested using uneven-age systems

Sample Design: N/A

Frequency of Measurement: 5 Years

Analysis Method: Compare acres with uneven-age Rx and acres harvested with uneven-age mgmt to the 20% threshold identified in the revised Plan

Last Year Accomplished: **Cost for Year Scheduled:** $300

Fiscal Year Scheduled: 2009 **Cost Per Decade:** $600

Reporting Frequency: 5 Years

Estimated Cost - Explanation: estimate no more than a day of a person's time to calculate each year.

Cooperators:

Monitoring Item Name: Forest-wide Water Quality Monitoring

Item Reference # 52

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

Detailed Monitoring Question: What is the existing status of water quality on the GMNF, and how are our management activities affecting water quality? (Note: This monitoring incorporates annual macrionvertebrate monitoring)

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: Goal 4: Maintain or restore aquatic, fisheries, riparian, and wetland habitats.

LRMP Rationale/Driver: This monitoring (along with other types of monitoring) address whether we are meeting Goal 4 - Maintain or restore aquatic, fisheries, riparian, vernal pool, and wetland habitats. Water quality is one critical component of these resources, and macroinvertebrate popuations are an important indicator of water quality.

Indicator & Measure: Indicator: Water Quality
Measures: For water quality - Dissolved Oxygen (DO), pH, Nitrite, Nitrate, Total N., Phosphate, Temperature, E. Coli, Turbidity, Conductivity, Total Dissolved Solids (TDS), stream area, velocity, and flow. Additional measures for Macroinvertebrates - stream width, depth, weather conditions, substrate composition, substrate embeddedness, canopy cover, streambank condition, immediate upstream use, and stream color condition.

Data Collection Method: Methods documented in the draft GMNF Water Quality Monitoring Plan, 2006-2009. This document will reside on the K drive when finalized in late FY06. Briefly, methods consist of collecting water samples in bottles. Some water tests are completed in the field or in the lab at the Supervisors Office. Other tests, including the macroinvertebrate monitoring, are conducted by the State Water Quality Division.

Sample Design: Sampling design documented in the draft GMNF Water Quality Monitoring Plan, 2006-2009. In summary, sampling design consists of collecting water samples at 1-3 locations in selected streams and lakes. Streams and lakes are selected for monitoring based on the:
1) Need to characterize the existing water quality condition and status of macroinvertebrate populations to establish baseline conditions; and
2) To what extent, and in what ways, does our management activities affect water quality?

Frequency of Measurement: Annually

Analysis Method: Analysis methods documented in the draft GMNF Water Quality Monitoring Plan, 2006-2009. Analysis consists of annual statistical summaries and comparison of data to accepted thresholds, such as Vermont's Water Quality Standards.

Last Year Accomplished: **Cost for Year Scheduled:** $15,600

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $156,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs are primarly salay time for Hal Bell ($13,600/year for water sample collection and testing - 3 days/pay period from April through Nov.; 1 day/pay period in March and Dec.; includes the ISCO site) and Kathy Donna ($2,000/year for data compilation and analysis). Annual costs of field equipment, supplies, ecoli and macroinvertebrate testing is about $6,000.

Cooperators: State of Vermont, Agency of Natural resources, Dept. of Environmental Conservation, Water Quality Division, Biomonitoring and Aquatic Studies Section Section.

Monitoring Item Name: Wild and Scenic Rivers

Item Reference # 66

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

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: MA - Eligible Wild, Scenic, and Recreational Rivers

LRMP Rationale/Driver: LRMP Table 4.1.7

Indicator & Measure: changes in road crossings in eligible river corridors, changes in trail bridge crossings in eligible river corridors, changes in harvest activity in eligible river corridors

Data Collection Method: INFRA; Data will be provided by INFRA as INFRA data is available linked spatially

Sample Design:

Frequency of Measurement: Annually

Analysis Method: Analysis of INFRA data; Comparison of INFRA data with river's Outstandingly Remarkable Values (ORVs) (list of eligible rivers' ORVs found in LRMP, Eligible Wild & Scenic Rivers MA). Analysis will compare management activities in river corridors with standard and guidelines for Eligible Wild, Eligible Scenic, and Eligible Recreation Rivers and with the river's ORVs.

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $10,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Staff cost of analyzing INFRA data and comparing to Plan requirements for eligible rivers

Cooperators:

Monitoring Item Name:	Wilderness Areas Managed to Standard
Item Reference # 41	
Monitoring Question	To what extent have Objectives been attained?
Detailed Monitoring Question:	How many wilderness areas are managed to national standards?
LRMP Tables Addressed:	LRMP 4.1-3 ☐ LRMP 4.1-4 ☐ LRMP 4.1-5 ☐ LRMP 4.1-6 ☑ LRMP 4.1-7 ☐
LRMP Reference:	Goal 13: Manage designated wilderness to preserve an enduring resource that represents ecosystems and natural processes unique to northeastern forests while providing opportunities for solitude and unconfined recreation consistent with the Wilderness Act
LRMP Rationale/Driver:	Wilderness Act, Goal 13, Objectives 1 and 2
Indicator & Measure:	Number of wilderness areas managed to standard (National Quality Standards at Recreation, Heritage, and Wilderness Integrated Business Systems at : http://www.fs.fed.us/r3/measures.
Data Collection Method:	Monitoring focuses on 10 wilderness stewardship elements that have been developed and applied nationally. These include: fire use, NNIS treatment, air quality related values, education plan implementation, opportunities for solitude or primitive and unconfined recreation, completed recreation site inventory, existing outfitter/guide operating plans, adequate forest plan direction to prevent degradation of resource, database administration & upward reporting, baseline workforce in place
Sample Design:	Various- see hyperlink
Frequency of Measurement:	Annually
Analysis Method:	Various
Last Year Accomplished:	**Cost for Year Scheduled:** $100,000
Fiscal Year Scheduled:	2007 **Cost Per Decade:** $1,000,000
Reporting Frequency:	Annually
Estimated Cost - Explanation:	70% of annual wilderness program of work is focused on this monitoring item
Cooperators:	Green Mountain Club, Vermont Monitoring Cooperative

Monitoring Item Name: Wilderness Character: Natural (Human Threats)

Item Reference # 44

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

Detailed Monitoring Question: What are the trends of human threats to natural conditions?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: MA - Wilderness

LRMP Rationale/Driver: Forest Plan, Wilderness Act & subsequent legislation, pending Forest Service policy

Indicator & Measure:

Indicator: Pollutants that degrade air quality and air quality related values such as plants, animals, soil, and water
Measures: Ozone exposure statistiv N100 - episodic ozone concentrations affecting sensitive plants
Ozone exposure statistic W126 - chronic ozone concentrations affecting sensitive plants
Concentration of sulfur in wet deposition
Concentration of nitrogen in wet deposition

Indicator: Developments that degrade the free-flowing condition of rivers and streams
Measures: # of dams inside wilderness

Indicator: Non-indigenous species that alter natural plant and animal communities
Measures: % of wilderness acres (in categories) with invasive plant species that are not indigenous to the wilderness
# of non-plant species (i.e., wildlife, livestock, fish, invertebrates, pathogens, or fungi) of concern that are not indigenous to the wilderness

Data Collection Method: Data will be collected using various methods in conjunction with partners and force account field staff.

Casnet, IMPROVE, NADP, Vermont Monitoring Cooperative, field data collection (NRIS database).

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $7,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $70,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Cost includes field data collection, funding of air and NNIS specialist, and data analysis.

Cooperators: Vermont Monitoring Cooperative, NRCS

Monitoring Item Name: Wilderness Character: Natural -Biophysical Conditions

Item Reference # 45

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

Detailed Monitoring Question: What are the trends of selected biophysical conditions and processes sensitive to human theats?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: MA - Wilderness

LRMP Rationale/Driver: Forest Plan, Wilderness Act & subsequent legislation, pending Forest Service policy

Indicator & Measure: Indicator: Visual air quality
Measures: Average sum of anthropogenic fine nitrate and sulfate
Average deciview

Indicator: Indigenous ecosystems, plant communities, and plant and animal species that have been extirpated
Measures: # of indigenous plant and animal species that have been extirpated

Data Collection Method: Information about species will be collected in cooperation with various resource specialists inside and outside the agency. Air quality information will come from IMPROVE monitoring site.

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs are for data consolidation and entry

Cooperators: Environmental Protection Agency, Vermont Monitoring Cooperative

Monitoring Item Name: Wilderness Character: Primitive Recreation

Item Reference # 40

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

Detailed Monitoring Question: What are the status and trends of outstanding opportunities for primitive recreation?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: MA - Wilderness

LRMP Rationale/Driver: Forest Plan, Wilderness Act & subsequent legislation, pending Forest Service policy

Indicator & Measure: Indicator: Recreation facilities
Measures: Index of recreation facilities

Indicator: Trail development level
Measure: # of trail miles in developed condition (classes 3 to 5)

Data Collection Method: INFRA

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished:

Cost for Year Scheduled: $1,000

Fiscal Year Scheduled: 2007

Cost Per Decade: $10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs will be for INFRA data analysis

Cooperators: Green Mountain Club

Monitoring Item Name: Wilderness Character: Solitude

Item Reference # 39

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

Detailed Monitoring Question: What are the status and trends of outstanding opportunities for solitude?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: MA - Wilderness

LRMP Rationale/Driver: Forest Plan, Wilderness Act & subsequent legislation, pending Forest Service policy

Indicator & Measure: Indicator: Remote, trailless wilderness
Measures: # of acres of wilderness away from access or travel routes

Indicator: Wilderness Visitation
Measure: # of parties visiting the wilderness during the primary use season
Measure: NVUM annual wilderness visits per region

Data Collection Method: NVUM, GIS, Register Sheets

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs will be for GIS analysis, NVUM, register sheet collection and analysis

Cooperators: Green Mountain Club

Monitoring Item Name: Wilderness Character: Unconfined Recreation

Item Reference # 46

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

Detailed Monitoring Question: What are the status and trends of outstanding opportunities for unconfined recreation?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: MA - Wilderness

LRMP Rationale/Driver: Forest Plan, Wilderness Act & subsequent legislation, pending Forest Service policy

Indicator & Measure: Indicator: Management restrictions on visitor behavior
Measures: Index of restrictions on visitor behavior

Data Collection Method: Supervisor's Closure Orders and fees for special uses

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs will be for data analysis

Cooperators: Green Mountain Club

Monitoring Item Name: Wilderness Character: Undeveloped - Inholdings

Item Reference # 38

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

Detailed Monitoring Question: What are the status and trends of inholdings?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: MA - Wilderness

LRMP Rationale/Driver: Forest Plan, Wilderness Act & subsequent legislation, pending Forest Service policy

Indicator & Measure: Indicator: Inholdings

Measures: acres of inholdings

Data Collection Method: GIS ALP files

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished:

Cost for Year Scheduled: $1,000

Fiscal Year Scheduled: 2007

Cost Per Decade: $10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs will be for ALP analysis

Cooperators:

Monitoring Item Name: Wilderness Character: Undeveloped - Motorized and Mechanical Transport

Item Reference # 37

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

Detailed Monitoring Question: What are the status and trends of the use of motorized equipment and mechanical transport?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: MA - Wilderness

LRMP Rationale/Driver: Forest Plan, Wilderness Act & subsequent legislation, pending Forest Service policy

Indicator & Measure: Indicator: Mechanical transport and motorized equipment use authorizations

Measures:
# of mechanical transport use days authorized
# of motorized equipment use days authorized

Data Collection Method: Minimum tools analysis / NEPA document
Emergency Letters to the File

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $5,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $50,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs will be for NEPA analysis, minimum tool analysis, and data consolidation

Cooperators: Green Mountain Club, State of Vermont, Search and Rescue Personnel

Monitoring Item Name: Wilderness Character: Undeveloped - Permanent Improvements

Item Reference # 36

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

Detailed Monitoring Question: What are the trends of physical evidence of modern human occupation or modification?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: MA - Wilderness

LRMP Rationale/Driver: Forest Plan, Wilderness Act & subsequent legislation, pending Forest Service policy

Indicator & Measure: Indicator: Physical evidence of development

Measures:
Index of physical development
- -- Buildings (including shelters, tent pads)
- -- System trails & major trail features
- -- Dams & instream structures
- -- Roads
- -- Utility infrastructure
- -- Mines
- -- User-created trails
- -- Fixed instrumentation sites

Data Collection Method: Various methods such as routine INFRA data collection protocol
Miles of unauthorized trails

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $6,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $60,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs will be for data consolidation and entry and field monitoring for unauthorized trails

Cooperators: Green Mountain Club

Monitoring Item Name: Wilderness Character: Untrammelled

Item Reference # 43

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

Detailed Monitoring Question: What are the trends of actions that control or manipulate the community of life in wilderness?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☐	☑

LRMP Reference: MA - Wilderness

LRMP Rationale/Driver: Forest Plan, Wilderness Act & subsequent legislation, pending Forest Service policy

Indicator & Measure: Indicator: Agency actions that control or manipulate plant communities, animal populations, soils, water-bodies or natural disturbance processes
Measures:
# of actions to manage:
-- Vegetation
-- Fish, wildlife, insects, and disease
-- Soil and water
-- Fire
% of natural fire starts that are not managed as wildland fire use
# of lakes and other water bodies stocked with fish

Data Collection Method: Wilderness management actions that impact untrammelled nature of wilderness will be monitored through internal scoping.

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $1,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Cost of INFRA WILD data entry

Cooperators:

Monitoring Item Name: Wilderness Field Presence

Item Reference # 42

Monitoring Question To what extent have Objectives been attained?

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

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: Goal 13: Manage designated wilderness to preserve an enduring resource that represents ecosystems and natural processes unique to northeastern forests while providing opportunities for solitude and unconfined recreation consistent with the Wilderness Act

LRMP Rationale/Driver: Wilderness Act, Goal 13, Objectives 2 and 3

Indicator & Measure: Number of staff days monitoring wilderness boundaries; Number of miles of wilderness boundaries monitored; Number of public education and outreach contacts.

Data Collection Method: Ranger observation sheets for field data; Public outreach contact records (classroom talks outside wilderness areas)

Sample Design:

Frequency of Measurement: Annually

Analysis Method:

Last Year Accomplished: **Cost for Year Scheduled:** $7,000

Fiscal Year Scheduled: 2007 **Cost Per Decade:** $70,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Estimated this monitoring takes 5% of wilderness program time & costs

Cooperators: Wilderness Outfitter/Guides

Monitoring Item Name: Wilderness Study Areas

Item Reference # 65

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

Detailed Monitoring Question: Are Wilderness Study Areas being managed to maintain roadless characteristics pending legislation as to their designation?

LRMP Tables Addressed:

LRMP 4.1-3	LRMP 4.1-4	LRMP 4.1-5	LRMP 4.1-6	LRMP 4.1-7
☐	☐	☐	☑	☐

LRMP Reference: MA - Wilderness Study Areas

LRMP Rationale/Driver: Forest Service policy

Indicator & Measure: changes in miles of motorized trail, changes in number of recreation facilities, change in miles of FS roads

Data Collection Method:

Sample Design:

Frequency of Measurement: Annually

Analysis Method: Analysis of INFRA data

Last Year Accomplished:

Cost for Year Scheduled: $1,000

Fiscal Year Scheduled: 2007

Cost Per Decade: $10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Cost is for staff analysis of INFRA data

Cooperators: