

Item # 94

Monitoring Item Name: Air Particulate

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.

Protocol Name: IMPROVE Site **Protocol Status:** Approved

Protocol Version/Date: Unknown **Spatial Extent (Scale):** National

Protocol Agency: EPA **Units of Measure:** Several

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Particulate monitoring at the national network of monitoring sites (including our IMPROVE site) characterizes air quality and trends throughout the nation. Air quality is a major factor influencing forest ecosystem health, and as well as human health.

Priority within Program: High

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.

Data Collection Method Hyperlink:

Sample Design: Our IMPROVE 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.

Sample Unit: Each IMPROVE site.

Frequency of Measurement: Weekly **Precision and Reliability:** Class A

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

Reference & Desired Values: Particulate levels below state and federal air quality regulations, and below the critical loads for for each natural resource sensitive receptor, are desired.

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$12,000

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$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.

Category: Air

Data Collection Logistics: Logistics as described in the IMPROVE protocols.

Required in-house Coordination: Coordinated between Hal Bell (Manchester) and Ann Acheson (GM&FL Air Specialist)

Data Storage: Handled by the EPA.

Data Storage Hyperlink:

Responsibility: Ann Acheson

Cooperators:

Item # 31

Monitoring Item Name: Fish and aquatic organism passage

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

Detailed Monitoring Question: Are culvert rehabilitation 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

Protocol Name: Culvert Survey **Protocol Status:** Approved

Protocol Version/Date: 2005 **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** miles of stream restored

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: There are potentially hundreds of culvert on the forest that may be barriers to fish and aquatic organism passage.

Priority within Program: Medium

Data Collection Method: Culvert Survey (Physical habitat and conditions in and around the pipe).
Electrofishing survey for fish population estimates and fish tagging studies.

Data Collection Method Hyperlink:

Sample Design: Weekly sampling during fish spawning seasons, generally in the fall but could happen in spring as well.

Sample Unit: Stream Structure (culvert)

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method: Coarse filter analysis and evaluation criteria for specific species; mark and recapture methods for tagged fish.

Reference & Desired Values: Reference - free flowing stream with no passage barriers.
Desired values - culverts that meet design criteria to pass bankful flows, woody debris and aquatic organisms

References (Literature Cited): GMNF - Culvert survey protocol; coarse filter chart and evaluation criteria.

Category: Aquatic Ecosystems

Last Year Accomplished:	2005	Cost for Year Scheduled (\$1,000):	\$3,000
Fiscal Year Scheduled:	2007	Cost Per Decade (\$1,000):	\$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.

Data Collection Logistics:

Required in-house Coordination:

Data Storage: excel spreadsheet for culvert surveys parameters

Data Storage Hyperlink:

Responsibility: fish biologist and district technicians

Cooperators: VTDEC
VDFW
USFWS
Watershed groups

Item # 29

Monitoring Item Name: Fish habitat and stream channel stability

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 identified 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 management 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.

Protocol Name: Level III & Hankin-Reeves surveys **Protocol Status:** Approved

Protocol Version/Date: July 2006 **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** miles

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): High

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: This data is critical to determine habitat changes and channel stability trends in streams of the GMNF.

Priority within Program: High

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.

Data Collection Method Hyperlink:

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.

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

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

Reference & Desired Values: habitat conditions described in Forest Plan Objectives and S&Gs

References (Literature Cited):

Last Year Accomplished:	2005	Cost for Year Scheduled (\$1,000):	\$12,000
Fiscal Year Scheduled:	2007	Cost Per Decade (\$1,000):	\$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.

Data Collection Logistics:

Required in-house Coordination:

Data Storage: State of Vermont Database (internet based); Forest files and server, NRIS water (when ready).

Data Storage Hyperlink:

Responsibility: fish biologists and technicians

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

Item # 30

Monitoring Item Name: Sedimentation/substrate embeddedness

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 spawning 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.

Protocol Name: Substrate embeddedness **Protocol Status:** Approved

Protocol Version/Date: Vibert boxes - 2004 **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** percent embeddedness and percent fine sediment

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Substrate embeddedness and sedimentation monitoring is an effective way to monitor habitat quality over time and provide quantitative measures of the effects of management activities on stream habitat.

Priority within Program: Medium

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.

Data Collection Method Hyperlink:

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.

Sample Unit: spawning gravel area (square foot measurement) and transects in riffle and run habitat.

Category: Aquatic Habitat

Frequency of Measurement:	Annually	Precision and Reliability:	Class A
Analysis Method:	<p>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.</p> <p>Hankin-Reeves habitat survey - embeddedness is measure by randomly 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.</p>		
Reference & Desired Values:	<p>Less than 20% fine sediment, sand and silt in spawning habitat. Less than 50% substrate embeddedness in riffle and run habitat.</p>		
References (Literature Cited):	<p>GMNF annual monitoring reports for Fiscal years 2000, 2002, and 2004. Application of hankin-Reeves Stream Survey, GMNF Vermont. January 1992.</p>		
Last Year Accomplished:	2004	Cost for Year Scheduled (\$1,000):	\$3,000
Fiscal Year Scheduled:	2009	Cost Per Decade (\$1,000):	\$18,000
Reporting Frequency:	5 Years		
Estimated Cost - Explanation:	4-6 streams monitored each year for first 5 years. 2-4 streams each year for next 5 years.		
Data Collection Logistics:			
Required in-house Coordination:			
Data Storage:	Excel spreadsheet designed specifically for stream substrate data.		
Data Storage Hyperlink:			
Responsibility:	district fish biologist and technicians		
Cooperators:	USFS NE Research Station Watershed Groups		

Item # 28

Monitoring Item Name: Water temperature in streams

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 community composition. These monitoring data help determine an aspect of water and habitat quality and where temperature may be too high and riparian 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.

Protocol Name: stream temperature monitoring **Protocol Status:** Approved

Protocol Version/Date: GMNF - water temps. 2006 **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** number of streams monitored

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: This is an important parameter for determining fish habitat quality and quantity.

Priority within Program: Low

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

Data Collection Method Hyperlink:

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).

Sample Unit: stream reach

Frequency of Measurement: Annually **Precision and Reliability:** Class B

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.

Reference & Desired Values: maintain cold-water habitat conditions in GMNF streams

References (Literature Cited):

Category: Aquatic Habitat

Last Year Accomplished:	2005	Cost for Year Scheduled (\$1,000):	\$3,000
Fiscal Year Scheduled:	2007	Cost Per Decade (\$1,000):	\$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		
Data Collection Logistics:			
Required in-house Coordination:			
Data Storage:	Excel spreadsheet		
Data Storage Hyperlink:			
Responsibility:	District Fish Techs		
Cooperators:			

Item # 27

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

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

Protocol Name: Salmon pop. monitoring **Protocol Status:** Approved

Protocol Version/Date: GMNF - pop. survey 2006 **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** # of sites & streams monitored

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: High

Priority within Program: High

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.

Data Collection Method Hyperlink:

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

Sample Unit: Sampling sites range from 200 ft to about 800 ft long.

Frequency of Measurement: Annually **Precision and Reliability:** Class A

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

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished:	2005	Cost for Year Scheduled (\$1,000):	\$8,000
Fiscal Year Scheduled:	2007	Cost Per Decade (\$1,000):	\$80,000
Reporting Frequency:	Annually		

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

Data Collection Logistics:

Required in-house Coordination:

Data Storage: Excel Spreadsheets designed specifically for salmon population data
NRIS water if compatible

Data Storage Hyperlink:

Responsibility: Forest Fisheries Biologist and District Fisheries Technicians

Cooperators: USFWS, VDFW

Item # 89

Monitoring Item Name: Fire Agreements

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

Protocol Name: **Protocol Status:** Draft

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** # agreements, # years

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: easy to monitor - simply counting agreements; have some agreements but could do better; it is important to establish and maintain these agreements in order to work with towns when we have fires there - keeps everyone involved; not tracking could lead to losing connections with towns; fire and partnerships are key national and regional issues

Priority within Program: Medium

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$0

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$0

Reporting Frequency: Annually

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

Data Collection Logistics:

Category: Fire

Required in-house Coordination:

Data Storage: Fire Management files and lweb

Data Storage Hyperlink:

Responsibility: Fire Management Officer

Cooperators:

Item # 90

Monitoring Item Name: Wildland Fire Use

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

Protocol Name: **Protocol Status:** Draft

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** tbd

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): High

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Wildland Fire Use has not been applied to the GM before, so is new; risks to resources can be very high if not tightly controlled; monitoring the effects of wildlife fire is critical for documentation and assessment of ecosystem changes and rehabilitation needs; if not monitored, potential to lose WFU as a tool; fire is a big national issue, but a small one on this Forest; monitoring requires establishment of plots and sampling, so has some cost

Priority within Program: High

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.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

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

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$10,000

Category: Fire

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.
Data Collection Logistics:	
Required in-house Coordination:	assistance from benefiting resource staff (e.g. Timber, Wildlife, Ecology) so that resource objectives will be accurately assessed
Data Storage:	FIREMON database stored with New England National Forests Fire Team
Data Storage Hyperlink:	
Responsibility:	Fire Planner
Cooperators:	The Nature Conservancy

Item # 88

Monitoring Item Name: Hazardous Fuels

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

Protocol Name: Protocol Status: Approved

Protocol Version/Date: Spatial Extent (Scale): Forest

Protocol Agency: Units of Measure: acres

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: easy to monitor as it reports information that is already reported in fire program; there is always risk to resources from fuel reduction work, but the work has been going on for a while and tends to be minor on this Forest

Priority within Program: Medium

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually Precision and Reliability: Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: Cost for Year Scheduled (\$1,000): \$500

Fiscal Year Scheduled: 2007 Cost Per Decade (\$1,000): \$5,000

Reporting Frequency: Annually

Estimated Cost - Explanation:

Data Collection Logistics:

Category: Fire

Required in-house Coordination:

Data Storage: National Fire Reporting Database, National Fire Plan Operations & Reporting system

Data Storage Hyperlink:

Responsibility: Fire Management Officer

Cooperators:

Item # 86

Monitoring Item Name: Prescribed Fire

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

Protocol Name: **Protocol Status:** Draft

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** tbd

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: the techniques associated with upland openings are not new, but using this technique for underburns in forests is still somewhat experimental; disparity is high; not knowing how well fire is working will mean we won't really know if we can maintain oak with fire in this region and if it's ineffective we won't change our technique and can lose the type; oak management was a key issue; involves setting up plots and sampling.

Priority within Program: High

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.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

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

Category: Fire

Fiscal Year Scheduled:	2007	Cost Per Decade (\$1,000):	\$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		
Data Collection Logistics:			
Required in-house Coordination:	assistance from benefiting resource staff (e.g. Timber, Wildlife, Ecology) so that resource objectives will be accurately assessed		
Data Storage:	FIREMON database stored within New England national Forests Fire Team		
Data Storage Hyperlink:			
Responsibility:	Fire Planner with assistance from benefiting resource staff (i.e. Timber or Wildlife so that resource objectives will be accurately assessed		
Cooperators:	The Nature Conservancy		

Item # 87

Monitoring Item Name: Fire Prevention

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.

Protocol Name: **Protocol Status:** Approved

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** # fires and acres

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): High

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: fire is a safety risk and there is always uncertainty regarding risks to adjacent private property; not knowing if our Rx burns are having effects on private could lead to loss of ability to use fire at all; easy to answer since it is simply counting occurrences

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$250

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$2,500

Reporting Frequency: Annually

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

Category: Fire

Data Collection Logistics:

Required in-house Coordination:

Data Storage: National Fire Report Database

Data Storage Hyperlink:

Responsibility: Fire Management Officer

Cooperators:

Item # 51

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

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; tree decline (foliage density, dieback, crown density)

Protocol Name: Forest Health Monitoring **Protocol Status:** Approved

Protocol Version/Date: **Spatial Extent (Scale):** National

Protocol Agency: Forest Service **Units of Measure:**

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): High

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: We must understand tree health trends over time, so we can adapt our management practices to achieve long term forest management goals; also addresses appeal concern with the ability of the forest to produce high quality wood products on long rotations (this was a concern with the 87 Plan as well)

Priority within Program: High

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

Data Collection Method Hyperlink:

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.

Sample Unit: Sample Unit: Northern Hardwoods Forest Type
Determining the spatial distribution of sampling sites is in progress.

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

Analysis Method: Using Forest Inventory and Analysis (FIA) protocols 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.

Reference & Desired Values: The initial plot establishment and data collection will establish baseline data. Subsequent sampling on a 5 year sampling frequency will then characterize and quantify tree health

changes as they take place over time. Desired value is a low level of tree decline over the long term.

References (Literature Cited):

Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$20,000
Fiscal Year Scheduled:	2011	Cost Per Decade (\$1,000):	\$47,000
Reporting Frequency:	5 Years		

Estimated Cost - Explanation: Part of LEMP. The cost to establish 20 plots is built into the LT Soil Quality and Soil Productivity Monitoring & Trends in Veg Composition items. Costs for collecting tree health measurements at those plots are as follows: 2007-2010 (\$0); 2011 first year measurements for all 20 plots (\$20,000); 2012 (\$0); 2013 re-sample 10 plots at \$1000 each (\$10,000); 2014 re-sample 10 plots at \$1000 each (\$10,000). This data collection will be done by contract with FIA or State Forest Health staff. No costs in years 2015-2017.

Data Collection Logistics: To be developed.

Required in-house Coordination:

Data Storage: Data to reside in NRIS databases.

Data Storage Hyperlink:

Responsibility: Soil Water Team

Cooperators: Vermont Monitoring Cooperative
Sean Lawson, Monitoring Director/Acting Executive Director.
Sean.Lawson@state.vt.us

USFS, Northern Research Station, Burlington
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Item # 60

Monitoring Item Name: Increase of Destructive Insects and Diseases
Monitoring Question Are insect and disease levels compatible with objectives for maintaining healthy forest conditions?
Detailed Monitoring Question: To what extent have destructive insects and disease organisms increased?

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:

Protocol Name: **Protocol Status:**
Protocol Version/Date: **Spatial Extent (Scale):** Forest
Protocol Agency: Forest Service **Units of Measure:**

Priority Question 1 (uncertainty associated with management assumptions): Medium
Priority Question 2 (disparity between existing and desired conditions): Medium
Priority Question 3 (management activities likely to affect resources of concern): Medium
Priority Question 4 (serious consequences from not knowing resource conditions): Medium
Priority Question 5 (monitoring responds to a key issue): Medium
Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: This is a NFMA monitoring requirement.

Priority within Program: High

Data Collection Method: Record the number of outbreaks (and acres affected) for each insect and disease organism (quantitative). Unless "damaging levels" have been concretely defined, a quantitative assessment of suppression 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.

Data Collection Method Hyperlink:

Sample Design: Number of outbreaks
 Acres affected
 Species of insects and diseases
Sample Unit: Forest wide mapping is conducted.

Frequency of Measurement: Annually **Precision and Reliability:**

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

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$2,000

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$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 specific situation and costs identified for more intensive surveys.

Data Collection Logistics:

Required in-house Coordination:

Data Storage: FS Veg (NRIS)

Data Storage Hyperlink:

Responsibility: Forest Silviculturist, Forest Ecologist and Forest Botanist

Cooperators: State & Private Forestry - Durham, NH

Item # 56

Monitoring Item Name: Measurement of Oak Growth with the Escarpment

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.

Protocol Name: **Protocol Status:**

Protocol Version/Date: **Spatial Extent (Scale):** Multit-district

Protocol Agency: Forest Service **Units of Measure:** inches of oak tree growth

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: The plots were established in 1991 and costs will be minimal to obtain 15-20 year data.

Priority within Program: Medium

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.

Data Collection Method Hyperlink:

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

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:**

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

Reference & Desired Values: The values are: 1. retention and longevity of oak within the escarpment management area. 2. Effect on the oak timber resource 3. effect on the acorn mast crop with management activities.

References (Literature Cited):

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

Fiscal Year Scheduled: 2011 **Cost Per Decade (\$1,000):** \$2,000

Reporting Frequency: 5 Years

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

Category: Forest Health

Data Collection Logistics:	Maps of the plot locations on Chandler Ridge are in the 2470 Permanent Files (Forest Silviculturist)
Required in-house Coordination:	Contact with S&PF - Forest Health Protection
Data Storage:	The electronic data is stored on a floppy disc. A hardcopy copy of the data is kept in the 2470 file folder.
Data Storage Hyperlink:	
Responsibility:	Forest Silviculturist
Cooperators:	S&PF - Forest Health Protection

Item # 49

Monitoring Item Name: Heritage Resource Program Objectives

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

Protocol Name: Heritage Resource Program Management

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale): Forest

Protocol Agency: Forest Service

Units of Measure:

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Low

Priority Rationale: These items are all the kinds of "Program Management" activities and accomplishments that are deferred or underfunded year after year to the detriment of the stewardship and management responsibilities of the Forest.

Priority within Program: High

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.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Category: Heritage**Frequency of Measurement:** Annually**Precision and Reliability:** Class B**Analysis Method:****Reference & Desired Values:****References (Literature Cited):****Last Year Accomplished:****Cost for Year Scheduled (\$1,000):** \$350**Fiscal Year Scheduled:** 2007**Cost Per Decade (\$1,000):** \$4,100**Reporting Frequency:** 5 Years**Estimated Cost - Explanation:** requires 1 day of Archaeologist; plus 1 day at year 5 and 10 for reporting.**Data Collection Logistics:****Required in-house Coordination:****Data Storage:** raw data related to heritage sites is stored in Heritage Module of I-web. Monitoring evaluation information is maintained in a spreadsheet stored on the Forests' server.**Data Storage Hyperlink:****Responsibility:** Forest Archaeologist**Cooperators:**

Item # 48

Monitoring Item Name: Heritage Resource Site Protection

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

Protocol Name: Heritage Changed Condition **Protocol Status:** Proposed

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** Site

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: The Forest is charged with inventorying and protecting Heritage Resources across the Forest, yet we persist in doing most of our I&M within project areas. This lack of knowledge about the condition of the majority of our resource base represents a high degree of uncertainty and risk about the effects of natural processes (e.g., erosion and vegetative encroachment) and human actions (e.g., vandalism) which may be undermining our commitment to Stewardship of these sites.

Priority within Program: High

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

Data Collection Method Hyperlink:

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 activities). We would desire a target sample of 5% of our inventory per year.

Sample Unit: Historically, we have used Compartments as our sample areas, "sites" as our reporting "unit".

Frequency of Measurement: Annually **Precision and Reliability:** Class B

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

Reference & Desired Values: Preference is No Deterioration or Damage to site. In some cases, enhancement/stabilization of a site is proposed and desirable.

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$5,000

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$50,000

Category: Heritage

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.

Data Collection Logistics:

Required in-house Coordination:

Data Storage: Heritage I-Web/INFRA component

Data Storage Hyperlink:

Responsibility: Forest Archaeologist

Cooperators:

Item # 47

Monitoring Item Name: Heritage Resource S&Gs

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

Protocol Name: Heritage S&G Monitoring **Protocol Status:** Proposed

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** Sites

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Heritage Resources are non-renewable. While the Forest has a reasonably good track record of site protection, gaps in inventory and failure to implement S&Gs are known to occur and should therefore be monitored. This can be done in a cost-effective manner and is an obligation to the public under our Plan and as stipulated by Law.

Priority within Program: High

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).

Data Collection Method Hyperlink:

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.

Sample Unit: All Heritage sites within the Area of Potential Effect of a project.

Frequency of Measurement: Annually **Precision and Reliability:** Class A

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).

Reference & Desired Values: Preference is No Deterioration or Damage to site. In some cases, enhancement/stabilization of a site is proposed and desirable.

References (Literature Cited):

Category: Heritage

Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$2,000
Fiscal Year Scheduled:	2007	Cost Per Decade (\$1,000):	\$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 analysis, the total is 6 GS-11 days per year -- or about \$2000

Data Collection Logistics:**Required in-house Coordination:**

Data Storage: Site condition information is stored in the Heritage I-Web/INFRA component

Data Storage Hyperlink:

Responsibility: Forest Archaeologist

Cooperators:

Item # 33

Monitoring Item Name: Contract sizes to local economies

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.

Protocol Name: **Protocol Status:**

Protocol Version/Date: **Spatial Extent (Scale):**

Protocol Agency: **Units of Measure:** dollars and board feet

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Monitoring economic contributions of the GMNF to local economies was a concern and socio-economic was a major issue. Many towns are greatly concerned about forest impacts on the economy. Tracking this information every five years will be simple with a low time commitment.

Priority within Program: Medium

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:**

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.

Reference & Desired Values: Baseline information will need to be established. Desired values would be a wider range than currently being supplied.

References (Literature Cited):

Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$1,000
Fiscal Year Scheduled:	2012	Cost Per Decade (\$1,000):	\$2,000
Reporting Frequency:	5 Years		

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

Data Collection Logistics:

Required in-house Coordination: Information will need to be obtained from contracting and from timber program

Data Storage:

Data Storage Hyperlink:

Responsibility: Forest Planner, economist or timber program

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

Item # 63

Monitoring Item Name: Partnerships Maintenance and Enhancement

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 official 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.

Protocol Name:	Protocol Status:	Draft
Protocol Version/Date:	Spatial Extent (Scale):	Forest
Protocol Agency:	Units of Measure:	1) Number of formal partnership agreements; 2) Number of FS Staff; 3) narrative document; 4) number of people hours

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Looking to enhance and/or build partnerships...some programs are doing well and some do not have any. The FS desires to have more partnerships to leverage funds and get more work completed on the ground. There is a desire internally and externally to have effective partnerships.

Priority within Program: High

Data Collection Method: Gather data from formal partnership agreements on lweb.
 Query FS staff on partnership participation and number of people hours contributed by

partnerships, and narrative on effectiveness.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually

Precision and Reliability: Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished:

Cost for Year Scheduled (\$1,000): \$1,000

Fiscal Year Scheduled: 2008

Cost Per Decade (\$1,000): \$5,000

Reporting Frequency: Annually

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

Data Collection Logistics:

Required in-house Coordination:

Data Storage: M&E Report, lweb

Data Storage Hyperlink:

Responsibility: EPPA or Partnership Coordinator

Cooperators:

Item # 62

Monitoring Item Name: Teacher professional development in Forest stewardship

Monitoring Question To what extent have Objectives been attained?

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

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.

Protocol Name:		Protocol Status:	Draft
Protocol Version/Date:		Spatial Extent (Scale):	Forest
Protocol Agency:		Units of Measure:	Number of teachers and number of programs offered

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Teacher development in forest stewardship has been an ongoing activity since 1999. Cost of monitoring is minimal.

Priority within Program:

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 3 years **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$100

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

Reporting Frequency: 5 Years

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

Data Collection Logistics:

Required in-house Coordination:

Data Storage: M&E Report

Data Storage Hyperlink:

Responsibility: Kathleen (Partnership Education Coordinator)

Cooperators:

Item # 32

Monitoring Item Name: County income by employment sector

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 Personal Income related to Forest Activities - see Table 3.21.19 FEIS page 3-377

Protocol Name: BEA Table CA05 **Protocol Status:**

Protocol Version/Date: BEA **Spatial Extent (Scale):** County

Protocol Agency: **Units of Measure:** Dollars

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Monitoring economic conditions will be valuable in future NEPA documents. The forest Plan had socio-economic concerns as a major issue and many towns are greatly concerned about forest impacts on the economy. Tracking this information every five years is simple with a low time commitment.

Priority within Program: Medium

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

Data Collection Method Hyperlink: <http://www.bea.gov/bean/regional/reis/default.cfm?catable=CA05>

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:**

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.

Reference & Desired Values: greater than in the FEIS

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$500

Fiscal Year Scheduled: 2012 **Cost Per Decade (\$1,000):** \$1,000

Reporting Frequency: 5 Years

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

Data Collection Logistics:

Required in-house Coordination:

Data Storage:

Data Storage Hyperlink: <http://www.bea.gov/bea/regional/reis/default.cfm?catable=CA05>

Responsibility: Forest Planner or economist

Cooperators: University of Vermont, Center for Rural Development

Item # 64

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

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.

Protocol Name: **Protocol Status:** Draft

Protocol Version/Date: **Spatial Extent (Scale):** Region

Protocol Agency: **Units of Measure:** narrative and comments

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: The Forest Service is doing a good job currently-feel we can always do better. If we fail to coordinate, the consequences are high.

Priority within Program: Medium

Data Collection Method: Query FS staff for narrative responses.

Query agencies, organizations, and groups for feedback

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Triannually **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$2,000

Fiscal Year Scheduled: 2009 **Cost Per Decade (\$1,000):** \$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)

Data Collection Logistics:

Required in-house Coordination:

Data Storage: M&E Report

Data Storage Hyperlink:

Responsibility: Forest Planner

Cooperators:

Item # 61

Monitoring Item Name: Forestry Education Sites

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.

Protocol Name:

Protocol Status: Draft

Protocol Version/Date:

Spatial Extent (Scale): Forest

Protocol Agency:

Units of Measure: Sites and Numer of Visitors

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: The public does not know a lot about what we do. Although we have some potential sites, none have been established with signage and NEPA completed. The consequences of not establishing two sites are an uninformed public. This was an issue raised during plan revision and it has been an internal FS desire for a number of years. Plots would be most cost effective to establish while establishing a demonstration forest would be more cost intensive.

Priority within Program: Medium

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.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years

Precision and Reliability: Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished:

Cost for Year Scheduled (\$1,000):

\$100

Category: Human Dimensions

Fiscal Year Scheduled: 2012 **Cost Per Decade (\$1,000):** \$200

Reporting Frequency: 5 Years

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

Data Collection Logistics:

Required in-house Coordination:

Data Storage: M&E report

Data Storage Hyperlink:

Responsibility: EPPA

Cooperators:

Item # 76

Monitoring Item Name: Payments to towns

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.

Protocol Name: **Protocol Status:**

Protocol Version/Date: **Spatial Extent (Scale):**

Protocol Agency: **Units of Measure:** dollars, contacts

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: I think we must track this information.

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

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

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$100

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

Reporting Frequency: Annually

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

Data Collection Logistics:

Required in-house Coordination:

Data Storage: M&E report - B&F.

Data Storage Hyperlink:

Responsibility: Partnership Coordinator, Administrative Officer.

Cooperators:

Item # 78

Monitoring Item Name: Non-native invasive species

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

Protocol Name: Invasive Plant Inventory **Protocol Status:** Approved

Protocol Version/Date: Terra v. 1.2.0.1 **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** Acres and/or Sites

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: NNIS S&Gs and NNIS treatment methods may or may not be effective; NNIS are already affecting riparian habitats and could easily begin to affect tree regeneration; ground-disturbing and light-increasing activities could easily spread NNIS or facilitate their growth; if monitoring does not occur in a timely manner, infestations may become impossible to control; NNIS are one of the chief's 4 main issues; monitoring requires site visits by trained personnel, but does not require unusual equipment

Priority within Program: High

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.

Data Collection Method Hyperlink: <http://www.fs.fed.us/emc/nris/products/invasives/index.shtml>

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.

Sample Unit: Either sites or acres - both are included as performance measures

Frequency of Measurement: Annually **Precision and Reliability:** Class B

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

Reference & Desired Values: Net infestation is currently known for many sites, but not all. If a project site has no NNIS infestations at the time of implementation, the goal is to prevent new ones from establishing. If the project site has infestations, the goal is to contain, control, or eradicate them. The desired infestation level is as close to zero as possible.

References (Literature Cited):

Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$5,500
Fiscal Year Scheduled:	2007	Cost Per Decade (\$1,000):	\$55,000
Reporting Frequency:	Annually		

Estimated Cost - Explanation: Approximately 20 days are needed per year to monitor: 1) the impact of NNIS on other resources; 2) the effectiveness of treatments; 3) implementation of standards and guidelines; and 4) to manage data. At a cost of about \$275/day, the yearly cost would be \$5,500.

Data Collection Logistics: Data collection must occur during the field season. An update to the corporate database is expected within the next few months and this will require sending someone to learn it, and having this person teach others. GPS units are required, and getting updated programs loaded onto laptop computers will be required.

Required in-house Coordination: Other staff involved would include persons on the vegetation management team (Rebecca Wright, Brian Keel)

Data Storage: NNIS data is stored in NRIS Terra, but treatments are reported through FACTS.

Data Storage Hyperlink: <http://www.fs.fed.us/emc/nris/terra/>

Responsibility: The Forest Botanist is responsible with the exception of upward reporting through FACTS, which is handled by Rebecca Wright.

Cooperators: Volunteers currently help w/ site inventories

Item # 91

Monitoring Item Name: Special Uses - Lands

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.

Protocol Name: **Protocol Status:**

Protocol Version/Date: **Spatial Extent (Scale):**

Protocol Agency: Forest Service **Units of Measure:** Authorizations administered to standard.

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: The degree of uncertainty is low: it must be done. There is a significant disparity between existing and required conditions, but progress is being made. Resource damage can occur on authorizations not administered to standard. Most would not have serious consequences. Monitoring by administering authorizations to standard is required by policy and S & G's. Monitoring can be very cost effective because many Forest associates can contribute to the effort.

Priority within Program: High

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.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit: Authorizations administered to standard.

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$1,200

Fiscal Year Scheduled: 2012 **Cost Per Decade (\$1,000):** \$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.

Data Collection Logistics:

Required in-house Coordination:

Data Storage: Case file and SUDS database

Data Storage Hyperlink:

Responsibility: Forest Special Uses Program manager

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

Item # 79

Monitoring Item Name: Land Ownership Adjustment

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

Protocol Name:

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale): Forest

Protocol Agency: Forest Service

Units of Measure: Acres

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Answering the question will not consume a lot of time, money or personnel.

Priority within Program: Low

Data Collection Method: Number of acres adjusted

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$0

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$0

Reporting Frequency: Annually

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

Data Collection Logistics:

Required in-house Coordination:

Category: Lands

Data Storage: ALPS

Data Storage Hyperlink:

Responsibility: Realty Specialist

Cooperators:

Item # 85

Monitoring Item Name: Innovative, Coordinated Management and Energy Conservation

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

Protocol Name: **Protocol Status:** Draft

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** numbers and narratives

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Some experience with coordination and innovation, not much with energy conservation; resource coordination (IDTs) are staple of forest management but not as innovative as it could be; we tend to be an innovative forest in some ways but could be better; big disparity between desired and current condition in terms of energy conservation; most everyone will be affected by this work, and some resources may benefit more than they used to; risks are higher for some areas than others; associated with courageous conservation; easy to monitor

Priority within Program: Medium

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.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Category: Program Management

Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$2,000
Fiscal Year Scheduled:	2012	Cost Per Decade (\$1,000):	\$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)		
Data Collection Logistics:			
Required in-house Coordination:			
Data Storage:	M&E Report		
Data Storage Hyperlink:			
Responsibility:	Forest Planner or EPPA		
Cooperators:			

Item # 84

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

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

Protocol Name: **Protocol Status:** Draft

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** # of S&Gs

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Required by Forest Plan and NFMA; not knowing the extent to which S&Gs are being implemented and effective could result in credibility problems with the public and internally, and could lead to inconsistent application which makes it difficult to measure effectiveness of S&Gs

Priority within Program: High

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

Data Collection Method Hyperlink:

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

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$5,000

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$50,000

Reporting Frequency: Annually

Estimated Cost - Explanation:

Data Collection Logistics: need to create data collection sheets for teams to use so data is in a consistent format

Required in-house Coordination: need to schedule trips at the appropriate time of year to evaluate for the specialists involved

Data Storage: spreadsheets or database developed by GMNF

Data Storage Hyperlink:

Responsibility: Forest Planner

Cooperators:

Item # 83

Monitoring Item Name: Standards & Guidelines Compliance

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

Protocol Name: **Protocol Status:** Draft

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** # of S&Gs

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Required by Forest Plan and NFMA; not knowing the extent to which S&Gs are being modified could result in credibility problems with the public and internally, and could lead to inconsistent application which makes it difficult to measure effectiveness of S&Gs

Priority within Program: High

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.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$0

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

Reporting Frequency: Annually

Category: Program Management

Estimated Cost - Explanation: estimate 2 days in FY07 to develop system to store the information (\$1000). Other years, cost is negligible to query and compile information annually.

Data Collection Logistics:

Required in-house Coordination: need to coordinate with project leaders, NEPA coordinators, and resource folks to identify where in project planning, NEPA, implementation process we will discover when S&Gs are modified

Data Storage: spreadsheet or database developed by GMFL

Data Storage Hyperlink:

Responsibility: Forest Planner

Cooperators:

Item # 82

Monitoring Item Name: Costs of Plan Implementation

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.

Protocol Name:

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale): Forest

Protocol Agency:

Units of Measure: dollars

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Monitoring the cost of producing outputs is important to the WO, RO and our public. Implementation of the plan is key, and the ability to fund the implementation of the plan at reasonable cost is crucial.

Priority within Program:

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

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 trends and inefficiencies.

Reference & Desired Values: current values are existing program funds.

References (Literature Cited):

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

Fiscal Year Scheduled: 2008 **Cost Per Decade (\$1,000):** \$10,000

Category: Program Management

Reporting Frequency: Annually

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

Data Collection Logistics:

Required in-house Coordination:

Data Storage: K drive

Data Storage Hyperlink:

Responsibility: program managers, B&F

Cooperators:

Item # 80

Monitoring Item Name: Outputs Accomplished - Other Resources

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

Detailed Monitoring Question: How do actual outputs compare to those projected in 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

Protocol Name:

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale): Forest

Protocol Agency:

Units of Measure: various

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: NFMA requirement - we have to report this

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$2,000

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

Data Collection Logistics: build as part of the M&E report

Required in-house Coordination: need to coordinate with all program managers and specialists who are responsible for resources identified in Table D-5

Data Storage: various

Data Storage Hyperlink:

Responsibility: Forest Planner

Cooperators:

Item # 93

Monitoring Item Name: Desired Future Condition

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

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

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

Protocol Name: FACT **Protocol Status:** Approved

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** acres, miles, point

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): High

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Tracking this information is crucial for project planning and development, stand data, and monitoprng the implementation of the forest plan.

Priority within Program: High

Data Collection Method: FACTS, NEPA documents, INFRA

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

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.

Reference & Desired Values: Forest Plan data layers will provide a baseline for existitng values - desired values are described in the FP objectives and management area descriptions.

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$2,500

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$25,000

Reporting Frequency: Annually

Category: Program Management

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

Data Collection Logistics: GPS locations for projects and descriptions of activities

Required in-house Coordination: All program managers will have to track program projects to report.

Data Storage: FACTS, other corporate data bases monitoring report

Data Storage Hyperlink:

Responsibility: Forest Silviculturist, NEPA, Planning

Cooperators:

Item # 23

Monitoring Item Name: RFSS Plant Population Trends

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

Detailed Monitoring Question: What are the population trends for sensitive plants on the 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 which 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

Protocol Name:		Protocol Status:	
Protocol Version/Date:		Spatial Extent (Scale):	Forest
Protocol Agency:	Forest Service	Units of Measure:	numbers, area, rank

Priority Question 1 (uncertainty associated with management assumptions):	Medium
Priority Question 2 (disparity between existing and desired conditions):	High
Priority Question 3 (management activities likely to affect resources of concern):	
Priority Question 4 (serious consequences from not knowing resource conditions):	High
Priority Question 5 (monitoring responds to a key issue):	High
Priority Question 6 (question can be cost effectively answered):	Medium

Priority Rationale: Sensitive plants are considered at risk to losing viability on the GM, and so by definition there is a high disparity between existing and desired conditions, potential effects can be significant, not knowing conditions could mean loss of populations, is a key issue due to NFMA and ESA. Population monitoring can be intensive and expensive, although costs can be reduced through use of volunteers

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Category: Rare Plants Population

Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$12,320
Fiscal Year Scheduled:	2007	Cost Per Decade (\$1,000):	\$123,200
Reporting Frequency:	Annually		

Estimated Cost - Explanation: FOR TERRESTRIAL PLANTS: Approximately 200 total populations to monitor every 5 years = about 40 populations per year. Pre-field work, site visit, & data entry requires about 1.5 days per population; 40 populations per year x 1.5 days/population = 60 days per year. Approximately 10 extra days per year are needed to account for annual leave & solve unexpected monitoring problems (equipment break downs, bad weather, taxonomic issues, etc.), resulting in a total of 70 days needed per year. Monitoring completed by GS-7 temporary seasonal staff would cost about \$150/day x 70 days per year = \$10,500/year. Costs may decrease as historical populations are relocated and accurately mapped (current location information is often poor). Volunteers currently help with about 5 populations per year, and could potentially do more when more accurate location information is available. Number of total populations varies as new populations are found and as species are added to and removed from the RFSS list. This work has traditionally been paid for out of NFWF. (Butternut, while on the RFSS list, is represented by numerous populations & is monitored whenever special funds are available, & so is not included in these numbers.) This work to be charged to project funds. FOR AQUATIC PLANTS: Approximately 25 total populations to monitor every 10 years in 13 ponds could be divided into 1-2 ponds per year. Pre-field work, site visit, and data entry requires about 4 days per pond. Monitoring of aquatic plants requires specialized taxonomic skills, and is generally contracted out at about \$350/day; \$350/day x 4 days per pond = \$1400 per pond. Monitoring all 13 ponds would cost \$1400 x 13 = \$18,200 per decade, or an average of \$1,820 per year. Costs may decrease if in-house expertise is developed, or volunteers are available and adequately trained. This work to be charged to NFIM funds.

Data Collection Logistics: need to build a cadre of volunteers (or VNNHP or other partners) who are willing to monitor half of sites to help reduce costs

Required in-house Coordination:

Data Storage: Plants??? Or VNNHP database

Data Storage Hyperlink:

Responsibility: Ecologist/Botanist

Cooperators:

Item # 35

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

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 Objectives.

Protocol Name: **Protocol Status:**

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** Percentage

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Need to conform to National Standard

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited): USDA Forest Service 2000. Landscape Aesthetics, A Handbook for Scenery Management. Agriculture Handbook Number 701.

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$0

Fiscal Year Scheduled: 2012 **Cost Per Decade (\$1,000):** \$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.

Data Collection Logistics:

Required in-house Coordination:

Data Storage: Planning files as Ammendment and Landscape Architect files.

Data Storage Hyperlink:

Responsibility: Landscape Architect

Cooperators:

Item # 68

Monitoring Item Name: Trail maintenance

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 maintained 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

Protocol Name: USFS Trail Condition Inventory/Meaningful Measures **Protocol Status:** Approved

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** Dollars

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Deferred maintenance on the GMNF trail system is already very high and growing steadily as budgets decline. Increased pressure from trail partners (existing and proposed) will only increase the size of the trail system and maintenance responsibilities. If deferred maintenance is not addressed there is potential for loss of life or property with serious negative repercussions. By completing trail condition surveys we can maintain data records so measures can be obtained at a reasonable cost level.

Priority within Program: High

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.

Data Collection Method Hyperlink: http://www.fs.fed.us/r3/measures/Cost/TR_instruction.htm

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$11,000

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$112,340

Reporting Frequency: 5 Years

Category: Recreation

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 coordination 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

Data Collection Logistics:

Required in-house Coordination:

Data Storage: I-WEB

Data Storage Hyperlink: <https://iweb.fs.usda.gov/login/welcome.uix>

Responsibility: Recreation program manager

Cooperators:

Item # 67

Monitoring Item Name: ROS settings

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

Protocol Name: ROS Mapping protocol **Protocol Status:** Approved

Protocol Version/Date: 1986 ROS Book **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** Percentage by ROS class

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Using computer aided inventory processes we should be able to develop a revised ROS inventory without laborious mapping techniques.

Priority within Program: Medium

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$2,000

Fiscal Year Scheduled: 2011 **Cost Per Decade (\$1,000):** \$5,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Costs are for staff time to complete revised inventory using computer techniques. 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.

Category: Recreation

Data Collection Logistics:

Required in-house Coordination:

Data Storage: Corporate spatial data (ROS coverage)

Data Storage Hyperlink: <J:\fsfiles\reflibrary\gis\gm>

Responsibility: Recreation Program Manager.

Cooperators:

Item # 74

Monitoring Item Name: Recreation Visitor Satisfaction

Monitoring Question To what extent have Objectives been attained?

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

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

Protocol Name: NVUM Sampling Procedures **Protocol Status:** Approved

Protocol Version/Date: Varies by sample year. **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** Per cent

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Analysis and evaluation will use data gathered from a required national effort.

Priority within Program: High

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.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$74,000

Fiscal Year Scheduled: 2010 **Cost Per Decade (\$1,000):** \$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.

Data Collection Logistics:

Required in-house Coordination:

Data Storage: Hard copy report and national website.

Data Storage Hyperlink:

Responsibility: Recreation Program Manager

Cooperators:

Item # 73

Monitoring Item Name: Comprehensive Trail Planning

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.

Protocol Name: **Protocol Status:** Proposed

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** Per cent

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Comparison of projects/planning completed with total GMNF acres can be accomplished very easily.

Priority within Program: Medium

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.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$1,500

Fiscal Year Scheduled: 2011 **Cost Per Decade (\$1,000):** \$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.

Data Collection Logistics:

Required in-house Coordination: Data retrieval will involve coordination between trail, NEPA, engineering and others that may have completed project level analyses.

Data Storage: Local files or spatial data.

Data Storage Hyperlink: <J:\sfiles\reflibrary\gis\gm>

Responsibility: Recreation Program Manager.

Cooperators:

Item # 72

Monitoring Item Name: Catamount Trail Designation

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).

Protocol Name: USFS core data dictionary **Protocol Status:** Approved

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** Miles and per cent

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Monitoring is to track progress on completion of designation for this trail.

Priority within Program: Medium

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.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$1,500

Fiscal Year Scheduled: 2011 **Cost Per Decade (\$1,000):** \$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.

Category: Recreation

Data Collection Logistics:

Required in-house Coordination:

Data Storage: I-WEB and Core spatial data.

Data Storage Hyperlink: <https://iweb.fs.usda.gov/login/welcome.uix>

Responsibility: Recreation Program Manager

Cooperators:

Item # 69

Monitoring Item Name: Effects of vehicle use off roads

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

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

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.

Protocol Name: Field procedures for Law Enforcement and Investigations Management Attainment and Reporting System (LEIMARS) **Protocol Status:** Approved

Protocol Version/Date: Version 2.5.3 **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** Number of incidents and per cent
Number of incidents and number of violations.

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: There is a high level of public concerns over this issue, but monitoring is difficult due to remote nature of activity and the number of access points. Proposed monitoring uses existing systems to capture data already gathered by law enforcement personnel.

Priority within Program: Medium

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.

Data Collection Method Hyperlink:

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

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

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

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$10,000

Category: Recreation

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.

Data Collection Logistics:

Required in-house Coordination: LEIMARS has limited access so coordination with LEI personnel will be needed to obtain data.

Data Storage: USFS corporate database - LEIMARS

Data Storage Hyperlink:

Responsibility: Reporting: Recreation Program Manager. Data collection and storage: Law Enforcement

Cooperators:

Item # 92

Monitoring Item Name: Special Uses - Recreation

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.

Protocol Name:

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale):

Protocol Agency: Forest Service

Units of Measure: authorizations administered to standard

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: The degree of uncertainty is low: it must be done. There is a significant disparity between existing and required conditions, but progress is being made. Resource damage can occur on authorizations not administered to standard. Most would not have serious consequences. Monitoring by administering authorizations to standard is required by policy and S & G's. Monitoring can be very cost effective because many Forest associates can contribute to the effort.

Priority within Program: High

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.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit: authorizations administered to standard

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$1,200

Fiscal Year Scheduled: 2011 **Cost Per Decade (\$1,000):** \$2,400

Reporting Frequency: 5 Years

Category: Recreation

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

Data Collection Logistics:

Required in-house Coordination:

Data Storage: Case files and IWeb - SUDS database.

Data Storage Hyperlink:

Responsibility: Forest Special Uses Program manager

Cooperators:

Item # 34

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

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?

Protocol Name:

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale): Forest

Protocol Agency:

Units of Measure: Quantity of projects or sites sampled

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: If proposed management activities overlooked visual quality, social values of U.S. citizens would not be addressed and tourism for the State of Vermont could be affected.

Priority within Program: High

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.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited): USDA Forest Service. 1974. National Forest Landscape Management, Volume 2, Chapter 1, The Visual Management System. Agriculture Handbook Number 462. USDA, Washington, D.C.

USDA Forest Service. 2000. Landscape Aesthetics, A Handbook for Scenery Management. Agriculture Handbook Number 701.

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$4,000

Category: Recreation

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$40,000

Reporting Frequency: Annually

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

Data Collection Logistics:

Required in-house Coordination:

Data Storage: Landscape Architect files, hard copy and/or on computer disk

Data Storage Hyperlink:

Responsibility: Landscape Archiect

Cooperators:

Item # 71

Monitoring Item Name: Recreation Facility Maintenance

Monitoring Question To what extent have Objectives been attained?

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

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 maintenance on GMNF developed recreation facilities.

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

Protocol Name: USFS Facility Condition Inventory/Meaningful Measures **Protocol Status:** Approved

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** Facility/site and per cent.

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Required condition surveys for deferred maintenance will complete data gathering. Summary tables developed at the WO will identify the Facility Condition Index. With a small amount of additional work we can identify measures to determine trends in maintenance. This is also going to be used for annual accomplishment reporting.

Priority within Program: High

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.

Data Collection Method Hyperlink: http://www.fs.fed.us/r3/measures/Cost/MI_RS.htm

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$6,000

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$62,000

Reporting Frequency: 5 Years

Category: Recreation

Estimated Cost - Explanation: The majority of costs are to complete annual condition inventories 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.

Data Collection Logistics:

Required in-house Coordination:

Data Storage: I-WEB

Data Storage Hyperlink: <https://iweb.fs.usda.gov/login/welcome.uix>

Responsibility: Recreation Program Manager.

Cooperators:

Item # 70

Monitoring Item Name: Trends in trail partnerships

Monitoring Question To what extent have Objectives been attained?

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

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 contributions 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.

Protocol Name: Grants and agreements protocol for I-WEB **Protocol Status:** Approved

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** Dollars and Per cent

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Data can be gathered very quickly from existing reports from INFRA and IWEB. Analysis will be relatively simple with limited time needed from staff.

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Biannually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

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

Fiscal Year Scheduled: 2008 **Cost Per Decade (\$1,000):** \$5,000

Category: Recreation

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 coordinator 350 taken twice = about \$1000

Data Collection Logistics:

Required in-house Coordination:

Data Storage: I-WEB

Data Storage Hyperlink: <https://iweb.fs.usda.gov/login/welcome.uix>

Responsibility: Recreation Program Manager

Cooperators:

Item # 54

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

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 understand 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

Protocol Name: GM&FL Soil & Water S&G Monitoring form provides the protocol; Protocols for Soil Quality Monitoring currently being developed **Protocol Status:** Draft

Protocol Version/Date: 06/14/2005 **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** Percent of time met

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Item 1 & 2 - Low priority because past monitoring has shown a high degree of compliance. Item 3 & 4 - High because non-compliance with S&Gs and mitigation measures can result in serious soil and water resource degradation. Item 5 - Soil and water protection is always a key issue on projects where soil disturbing activities are planned.

Priority within Program: High

Data Collection Method: For S&G and mitigation 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.

Data Collection Method Hyperlink: K:\gmfl\2000\2500_watershed_and_air_management\2520_watershed_protection_and_management\sw_monitoring\2005_swf_timber_sale_monitoring\Draft field forms\TS field monitoring questionnaire- draft4.doc

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.

Sample Unit: Project area, or in the case of timber sales, harvest unit.

Frequency of Measurement: Variable depending on the assessment of risk to the resources **Precision and Reliability:** A & B

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.

Reference & Desired Values: Current value = Estimated 95% overall compliance with S&Gs, mitigation measures, and soil quality standards.
Desired value = 100% compliance

References (Literature Cited): FSH R9RO 2509.18-2005-1
FSM2509.18-91-1

Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$6,000
Fiscal Year Scheduled:	2007	Cost Per Decade (\$1,000):	\$60,000

Reporting Frequency: Annually

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

Data Collection Logistics: Soil/Water Team to determine monitoring sites and frequencies, and set schedule.

Required in-house Coordination: Coordinate this monitoring with Fisheries and water quality monitoring, so that data can be integrated.

Data Storage: Data to be stored in an Access Database, to be developed in early FY07. If NRIS-TERRA is adapted to accept this data, it will eventually be stored there.

Data Storage Hyperlink:

Responsibility: Soil/Water Team

Cooperators: Forest Management Team

Item # 53

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

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). Potential indicators of change in soil productivity 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 meteorological parameters

Protocol Name: Soil quality - Vermont Monitoring Cooperative - Long Term Soil Monitoring Project. **Protocol Status:** Draft

Protocol Version/Date: Draft, undated (last version in 2003) **Spatial Extent (Scale):** For 5 plots in VT

Protocol Agency: Forest Service **Units of Measure:** Several

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Climate change and acid deposition may affect land (and tree) productivity over time, either in conjunction with or independent of management activities. Management activities may need to be adjusted to meet the changing productivity. A lack of information about changes in land productivity could result in less than optimum forest management methods being applied. This could result in a decrease in land productivity and health of the Forest. This monitoring may, over the long term, also reveal important management implications for the fisheries and wildlife resources, and NNIS. Last, the public is concerned about the effects of acid deposition on soil quality and productivity. We expect public concerns over the effects of climate change on soils will increase significantly over the next few years.

Priority within Program: High

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?"

Data Collection Method Hyperlink:

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 types 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.

Sample Unit: Each of the 40 plots.

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

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.

Reference & Desired Values: Current Values: Unknown
Desired: Unknown

References (Literature Cited): Burt, Nancy, Villars, Thomas, and Stratton, Dayle Ann. Acid deposition and its potential effects on soil productivity and timber management in the Green Mountain National Forest, Vermont. Published report for the Forest Service, 2005.
USDA -Natural Resources Conservation Service, Soil Survey Division Staff. Soil Survey Manual. U.S. Government Printing Office. 1993.

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$30,250

Fiscal Year Scheduled: 2008 **Cost Per Decade (\$1,000):** \$184,250

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Part of LEMP. The costs for this item includes 55% of the total cost to establishment 20 plots over 4 years, plus data measurement (except tree health info) in the year of establishment: 2007 (\$0); 2008 establish and measure 5 plots (\$33,000); 2009 establish and measure 5 plots (\$33,000); 2010 establish and measure 5 plots (\$30,250); 2011 establish and measure 5 plots (\$27,500); 2012 (\$0); 2013 re-sample 10 plots @ \$3025 each (\$30,250); 2014 re-sample 10 plots @ \$3025 each (\$30,250). No costs in years 2015-2017.

Data Collection Logistics: To be worked out by the LTEM project cooperators.

Required in-house Coordination: To be determined.

Data Storage: Data to be stored in the NRIS- Terra module, to the extent possible. Data from the two Vermont Monitoring Cooperative (VMC) Long Term Soil Monitoring Plots will also reside in the VMC database.

Data Storage Hyperlink:

Responsibility: Soil/Water/Ecology Teams

Cooperators: Vermont Monitoring Cooperative
Sean Lawson, Monitoring Director/Acting Executive Director.
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Item # 21

Monitoring Item Name: Ecological Type Mapping and Representation

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

Protocol Name: TEUI **Protocol Status:** Approved

Protocol Version/Date: 2005 **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** acres

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Annually updating the proportion of existing eco-types in the reference area network is simply a GIS query and is of likely low priority unless we purchase a bunch of land. However, the current classification of ecological types is either old or speculative and none are consistent with TEUI protocols, so the gap between existing and desired conditions in terms of effectiveness of measuring ecological diversity and PNV is big. Having good maps and interpretations means less field checking during projects; having poor maps means more field checking during projects - one way or another resources of concern will be protected. Not a big revision issue. Can be cost-effective in terms of using GIS and remotely sensed data to premap, but will still require field sampling and data analysis, as well as a lot of geoprocessing, which is costly

Priority within Program: High

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)

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Category: Terrestrial Ecological Units

Frequency of Measurement:	5 Years	Precision and Reliability:	Class B
Analysis Method:	see TEUI Technical Guide (GTR WO-68, September 2005)		
Reference & Desired Values:	current values are all ecotypes defined in the FEIS are represented at at least 10%; the desired values identified in the plan objective is that types are represented at at least 5% level		
References (Literature Cited):	Winthers, E., D. Fallon, J. Haglund, T. DeMeo, G. Nowacki, D. Tart, M. Ferwerda, G. Robertson, A. Gallegos, A. Rorick, D.T. Cleland, and W. Robbie. 2005. Terrestrial ecological unit inventory technical guide. General Technical Report WO-68. USDA Forest Service, Washington DC. 245 pp.		
Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$300
Fiscal Year Scheduled:	2007	Cost Per Decade (\$1,000):	\$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.		
Data Collection Logistics:	Coordinate with field data gathering efforts associated with landscape assessment inventories		
Required in-house Coordination:			
Data Storage:	NRIS-Terra		
Data Storage Hyperlink:			
Responsibility:	Ecologist		
Cooperators:			

Item # 12

Monitoring Item Name: Wildlife Reserve Trees

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

Detailed Monitoring 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

Protocol Name: line transects **Protocol Status:** Various

Protocol Version/Date: Various **Spatial Extent (Scale):** Stand

Protocol Agency: **Units of Measure:** Reserve Trees/acre

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Regional and local interest reserve trees and snags; potential issue of concern for appeals and litigation of projects due to endangered Indiana bat

Priority within Program: Medium

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A and B

Analysis Method: Various

Reference & Desired Values: Various

References (Literature Cited): Various

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$2,000

Fiscal Year Scheduled: 2011 **Cost Per Decade (\$1,000):** \$4,000

Reporting Frequency: 5 Years

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

Data Collection Logistics: Various

Required in-house Coordination: FS crews and vounteers

Data Storage:

Data Storage Hyperlink:

Responsibility: GMNF Wildlife Program

Cooperators: VFWD

Item # 10

Monitoring Item Name: MIS Habitat Trends

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

Protocol Name: Various (species-specific) **Protocol Status:**

Protocol Version/Date: Various (species-specific) **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** Various (species-specific)

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): High

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: MIS mandated by NFMA, high potential for playing role in appeals and litigation

Priority within Program: High

Data Collection Method: Various (species-specific): vegetation database queries, site inspection of deer wintering areas

Data Collection Method Hyperlink:

Sample Design: Various (species-specific)

Sample Unit: Various (species-specific)

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A and B

Analysis Method: Various (species-specific)

Reference & Desired Values: Various (species-specific)

References (Literature Cited): Various (species-specific)

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

Fiscal Year Scheduled: 2011 **Cost Per Decade (\$1,000):** \$2,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: estimated 4 days of database queries and analysis of data at \$250/day

Data Collection Logistics: Various (species-specific)

Category: Terrestrial Wildlife Habitat

Required in-house Coordination:

Data Storage: Various (species-specific), FAUNA

Data Storage Hyperlink:

Responsibility: GMNF Wildlife Program

Cooperators: VFWD, NWF, VINS

Item # 75

Monitoring Item Name: Deer Wintering Areas

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 document use of areas.

Protocol Name: **Protocol Status:**

Protocol Version/Date: **Spatial Extent (Scale):**

Protocol Agency: **Units of Measure:**

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Deer Wintering Habitat is MIS, also focal issue in Plan Revision FEIS

Priority within Program: High

Data Collection Method:

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$2,500

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$25,000

Reporting Frequency: 5 Years

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

Data Collection Logistics:

Required in-house Coordination:

Data Storage: FAUNA
Data Storage Hyperlink:
Responsibility: GMNF Wildlife Program
Cooperators: VFWD, VINS

Item # 11

Monitoring Item Name: Early Successional Habitat

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

Detailed Monitoring Question: Are temporary & permanent openings used by ESH species? What are short- and long-term changes in structural components 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

Protocol Name: point counts/track counts **Protocol Status:**

Protocol Version/Date: Various **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** presence/absence

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): High

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Regional and local public interest in permanent and temporary openings, need for, size of, and distribution of openings are potential issues of concern for appeals and litigation of projects

Priority within Program: High

Data Collection Method: Various: vegetation database queries, long-term site inspection and vegetative measures of permanent and temporary openings, breeding bird surveys

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A and B

Analysis Method: Various

Reference & Desired Values: Various

References (Literature Cited): Various

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$2,500

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$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.

Data Collection Logistics: Various

Category: Terrestrial Wildlife Habitat

Required in-house Coordination: Volunteers/crews

Data Storage:

Data Storage Hyperlink:

Responsibility: GMNF Wildlife Program

Cooperators: VFWD

Item # 9

Monitoring Item Name: MIS Population Trends

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

Detailed Monitoring Question: What are 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)

Protocol Name: Various (species-specific) **Protocol Status:**

Protocol Version/Date: Various (species-specific) **Spatial Extent (Scale):** Region

Protocol Agency: **Units of Measure:** Various (species-specific)

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): High

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: MIS mandated by NFMA, high potential for playing role in appeals and litigation

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design: Various (species-specific)

Sample Unit: Various (species-specific)

Frequency of Measurement: Annually **Precision and Reliability:** Class A and B

Analysis Method: Various (species-specific)

Reference & Desired Values: Various (species-specific)

References (Literature Cited): Various (species-specific)

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$6,000

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$60,000

Reporting Frequency: Annually

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

Data Collection Logistics: Various (species-specific)

Category: Terrestrial Wildlife Population

Required in-house Coordination:

Data Storage: Various (species-specific): FAUNA,

Data Storage Hyperlink:

Responsibility: GMNF Wildlife Program

Cooperators: VFWD

Item # 8

Monitoring Item Name: RFSS Odonates and Lepidopterans

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

Protocol Name: **Protocol Status:**

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** Number of individuals species

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: RFSS of local and regional interest and concern, management actions could result in effects, poor baseline knowledge

Priority within Program: Low

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit: Presence, number of sightings or reported occurrences

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$5,000

Fiscal Year Scheduled: 2011 **Cost Per Decade (\$1,000):** \$10,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: estimated contract or partnership cost

Data Collection Logistics:

Category: Terrestrial Wildlife Population

Required in-house Coordination: Volunteers and contracting

Data Storage: FAUNA, VINS

Data Storage Hyperlink:

Responsibility: GMNF Wildlife Program

Cooperators: VINS, contractors

Item # 1

Monitoring Item Name: Bald Eagle

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

Protocol Name: Contact cooperators **Protocol Status:** Proposed

Protocol Version/Date: **Spatial Extent (Scale):** Region

Protocol Agency: **Units of Measure:** Individual birds and nests

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: TE species of local and regional interest, likely near but not on Forest, little potential management effect

Priority within Program: Low

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit: Individual birds and nests

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$0

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$0

Reporting Frequency: Annually

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

Data Collection Logistics:

Category: Terrestrial Wildlife Population

Required in-house Coordination:

Data Storage: FAUNA

Data Storage Hyperlink:

Responsibility: GMNF Wildlife Program

Cooperators: USFWS, VFWD, NWF, VINS

Item # 5

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

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

Protocol Name: Contact cooperators **Protocol Status:** Proposed

Protocol Version/Date: **Spatial Extent (Scale):** Region

Protocol Agency: **Units of Measure:** Number of individuals

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: TE species of local and regional interest, but not likely on or near Forest, no current potential management effect

Priority within Program: Low

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit: Presence, number of sightings or reported occurrences

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$0

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$0

Reporting Frequency: Annually

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

Data Collection Logistics:

Category: Terrestrial Wildlife Population

Required in-house Coordination:

Data Storage: FAUNA, USFWS, VFWD

Data Storage Hyperlink:

Responsibility: GMNF Wildlife Program

Cooperators: USFWS, VFWD, NWF, VINS

Item # 6

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

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

Protocol Name: Hankin & Reeves Basin-wide Habitat Survey **Protocol Status:**

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** Number of individuals

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Reptiles and amphibian RFSS of local and regional interest and concern, management actions with potential to result in adverse or beneficial effects, especially relative to wetlands, seasonal pools

Priority within Program: Medium

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit: Presence, number of sightings or reported occurrences

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$500

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$5,000

Reporting Frequency: Annually

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

Data Collection Logistics:

Required in-house Coordination: Coordinate data collection with fish survey crews

Data Storage: FAUNA, Vermont Reptile and Amphibian Atlas

Data Storage Hyperlink: <http://community.middlebury.edu/~herpatlas/>

Responsibility: GMNF Wildlife Program

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

Item # 7

Monitoring Item Name: Peregrine Falcon

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

Protocol Name: focused observations **Protocol Status:**

Protocol Version/Date: **Spatial Extent (Scale):** Statewide

Protocol Agency: **Units of Measure:** number of fledged young

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: RFSS of local and regional interest and concern, management actions unlikely to result in effects, although management of recreation uses may be necessary seasonally

Priority within Program: Low

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit: Individual birds and nests

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$2,500

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$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.

Data Collection Logistics:

Category: Terrestrial Wildlife Population

Required in-house Coordination: volunteers and Forest staff

Data Storage: FAUNA, USFWS, VFWD

Data Storage Hyperlink:

Responsibility: GMNF Wildlife Program

Cooperators: USFWS, VFWD, NWF, VINS

Item # 77

Monitoring Item Name: Wildlife in Remote Areas

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 areas 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

Protocol Name: **Protocol Status:**

Protocol Version/Date: **Spatial Extent (Scale):**

Protocol Agency: **Units of Measure:**

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Issue of interest and concern relative to Wilderness and habitat management for wildlife

Priority within Program: Medium

Data Collection Method: breeding bird surveys, track counts

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A and B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$2,500

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$5,000

Reporting Frequency: 5 Years

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

Data Collection Logistics:

Required in-house Coordination:

Data Storage:

Data Storage Hyperlink:

Responsibility: GMNF Wildlife Program

Cooperators: VFWD, VINS

Item # 2

Monitoring Item Name: Bicknell's Thrush

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

Protocol Name: Mountain Birdwatch **Protocol Status:** Proposed

Protocol Version/Date: **Spatial Extent (Scale):** Region

Protocol Agency: VINS **Units of Measure:** Singing birds

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: RFSS of local and regional interest and concern

Priority within Program: Medium

Data Collection Method: VINS Mountain Birdwatch

Data Collection Method Hyperlink: <http://www.vinsweb.org/cbd/mbwprep.html>

Sample Design: Breeding bird survey

Sample Unit: Presence/number of singing birds

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

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

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

Data Collection Logistics: Managed by VINS

Required in-house Coordination: FS staff conduct up to two surveys per year at Killington Peak and Bloodroot Gap.

Category: Terrestrial Wildlife Population

Data Storage: FAUNA; VINS
Data Storage Hyperlink:
Responsibility: GMNF Wildlife Program
Cooperators: VINS

Item # 4

Monitoring Item Name: TES Bats

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

Detailed Monitoring Question: 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

Protocol Name: Indiana Bat protocols **Protocol Status:** Approved

Protocol Version/Date: **Spatial Extent (Scale):** Region

Protocol Agency: FWS **Units of Measure:** Number of individuals

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): High

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Endangered and RFSS species of local and regional interest and concern

Priority within Program: High

Data Collection Method: Mist-net and acoustic sampling surveys

Data Collection Method Hyperlink:

Sample Design: Indiana Bat Recovery Team survey and sampling protocols

Sample Unit: bats/trap (net) nights

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$5,000

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$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.

Data Collection Logistics: Information and data collection partnership with VFWA.

Category: Terrestrial Wildlife Population

Required in-house Coordination:

Data Storage: FAUNA, USFWS, VFWD

Data Storage Hyperlink:

Responsibility: GMNF Wildlife Program

Cooperators: USFWS, VFWD

Item # 3

Monitoring Item Name: Common Loon

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

Protocol Name: Contact cooperators; Loon watch day **Protocol Status:** Proposed

Protocol Version/Date: **Spatial Extent (Scale):** Statewide

Protocol Agency: **Units of Measure:** Individual birds and nests

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: RFSS of local and regional interest, likely near but not on Forest, little potential management effect

Priority within Program: Low

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit: Individual birds and nests

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$500

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

Data Collection Logistics: Managed by VINS

Category: Terrestrial Wildlife Population

Required in-house Coordination: FS staff conduct surveys of several ponds on Forest.

Data Storage: FAUNA; VINS

Data Storage Hyperlink:

Responsibility: GMNF Wildlife Program

Cooperators: VFWD, NWF, VINS

Item # 59

Monitoring Item Name: Suited Timber Lands

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:

Protocol Name:

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale): Forest

Protocol Agency: Forest Service

Units of Measure:

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: This is a NFMA required monitoring item.

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 10 Years

Precision and Reliability:

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 if significant acres have changed in suitability. If significant, an ASQ analysis should be conducted and may require a Forest Plan amendment or change.

Reference & Desired Values: ASQ, suitable acres

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$10,000

Fiscal Year Scheduled: 2016 **Cost Per Decade (\$1,000):** \$10,000

Reporting Frequency: 10 Years

Estimated Cost - Explanation: Data will be used from stand inventories. Costs only include the anticipated 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.

Category: Vegetation

Data Collection Logistics:

Required in-house Coordination:

Data Storage: FS Veg (NRIS) and CDS

Data Storage Hyperlink:

Responsibility: Forest Planner

Cooperators:

Item # 81

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

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

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

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 annually and total for the decade.
MMBF Volume of Sawtimber and Pulp offered and sold in FY and decade.

Protocol Name: **Protocol Status:**

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** acres, MMBF, MMCF

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: NFMA requirement - have to report on this; impacts of not being aware of this are high for many reasons

Priority within Program: High

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.

Data Collection Method Hyperlink:

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

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$500

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

Category: Vegetation

Data Collection Logistics:

Required in-house Coordination:

Data Storage: timber databases

Data Storage Hyperlink:

Responsibility: Forest management program leader

Cooperators:

Item # 22

Monitoring Item Name: Rare or Outstanding Natural Areas

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)

Protocol Name:	Protocol Status:
Protocol Version/Date:	Spatial Extent (Scale): Forest
Protocol Agency:	Units of Measure: actions, acres, ranks

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Monitoring actions taken is easy as it simply queries existing reporting; management can affect significant features when we either don't know they are there, or don't bother to monitor them over time, so risks are high there; protection of special areas was a concern during revision, and some were not given special designations;

Priority within Program: Medium

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

Data Collection Method Hyperlink:

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.

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class B

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

Reference & Desired Values: current values are significant feature ranks recorded in VNNHP database for each site; desired values are preferably A (or B when A is impossible) ranks for these sites. Some very small sites are too small to qualify for A ranks, although appropriate management of adjacent lands could lead to an A rank.
Inventories should ultimately lead to diminishing returns (fewer sites found as we continue to

inventory) as well as enhanced search models (better predictions of where significant features might be found) that limit need for broader inventories.

References (Literature Cited):

Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$5,000
Fiscal Year Scheduled:	2007	Cost Per Decade (\$1,000):	\$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

NFIM funding needed increased to \$5300 in 2012 to reflect increased salary costs.

Data Collection Logistics: need to build a cadre of volunteers (or VNNHP or other partners) who are willing to monitor half of sites to help reduce costs

Required in-house Coordination: FM Team, Botanist

Data Storage: Plants???

Data Storage Hyperlink:

Responsibility: Ecologist

Cooperators: VNNHP?

Item # 24

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

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

Protocol Name: Silvexam **Protocol Status:** Approved

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: Forest Service **Units of Measure:** acres

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: There are wide gaps between current and DFC for composition; forest composition is one thing that we can most directly affect through management; composition related to aspen and openings were key revision issues; cost effective in that Silvexam is a well-established method, and that counting acres is a simple CDS query; uncertainty and serious consequences related to oak management and our knowledge of how to maintain oak, and aspen management in that not knowing means we may lose what we have.

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design: see Silvexam handbook

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

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.

Reference & Desired Values: Current values - see Forest Plan FEIS; desired values - see Table 2.2-1 of Forest Plan

References (Literature Cited): see Forest Plan FEIS

Category: Vegetation

Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$1,000
Fiscal Year Scheduled:	2011	Cost Per Decade (\$1,000):	\$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.		
Data Collection Logistics:	Level of detail of data collection will be reflected in IDT decisions on inventory for landscape assessments, and FMT decisions on other Silvexam efforts		
Required in-house Coordination:	NFIM Coordinator, Silviculturist, Ecologist, Forest Management Team, Landscape Assessment IDT		
Data Storage:	FS-Veg; Terra		
Data Storage Hyperlink:			
Responsibility:	Forest Silviculturist & Forest Ecologist		
Cooperators:			

Item # 25

Monitoring Item Name: Sustainability of Special Forest Product Gathering

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

Protocol Name:

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale): Forest

Protocol Agency:

Units of Measure: numbers of products, permits

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: We have little quantitative information on what people are gathering or if any of the products out there are being gathered unsustainably - the DFC is to know what people are gathering and use permits to control use, so the disparity is high; uncertainty may ultimately lead to decline in some species if we have no idea what is being gathered; #'s of permits and products are easy to monitor using FACTS queries

Priority within Program: Medium

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.

Data Collection Method Hyperlink:

Sample Design: see Emery proposal 2002

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values: Currently we only know what SFPs require permits - those that have historically required permits (e.g. maple tapping, walking sticks, etc), and we anecdotally have some ideas about what people gather. Desire is to know what people gather, what they gather a lot of, and what products may have sustainability concerns.

References (Literature Cited):

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

Category: Vegetation

Fiscal Year Scheduled:	2007	Cost Per Decade (\$1,000):	\$26,000
Reporting Frequency:	Annually		
Estimated Cost - Explanation:	[Yr1:\$500; Yr2:\$17500; other yrs \$1000] 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.		
Data Collection Logistics:	need to coordinate with Marla Emery on any changes to 2002 proposal;		
Required in-house Coordination:	Coordinate with FACTS person for queries		
Data Storage:	FACTS		
Data Storage Hyperlink:			
Responsibility:	Ecologist		
Cooperators:	Northern Research Station		

Item # 16

Monitoring Item Name: Aspen-Birch & Early Successional Habitat

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

Protocol Name: **Protocol Status:**

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** acres

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): High

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: High levels due to lack of historic success in achieving this objective; large difference between current and DFC; regional impacts if lose habitat on GM; risk of loss of habitat if don't monitor (short-lived condition); major WL and veg issue during revision; easy to answer as it gathers data already reported by program areas (timber, WL)

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

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

Reference & Desired Values: Current values for aspen-birch and early successional habitat (0-9 age class) are listed in FEIS; desired values are listed in Table 2.2-1 (aspen-birch) and Table 2.2-2 (0-9 age class) in revised Plan

References (Literature Cited): see FEIS

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

Fiscal Year Scheduled: 2011 **Cost Per Decade (\$1,000):**

Reporting Frequency: 5 Years

Category: Vegetation

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
Data Collection Logistics:	work with FMT and WL team to gather treatment acres data
Required in-house Coordination:	WL Bio, Silviculturist
Data Storage:	FSVeg
Data Storage Hyperlink:	
Responsibility:	Ecologist & WL Biologist
Cooperators:	

Item # 17

Monitoring Item Name: Permanent Upland Openings

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

Protocol Name:	Protocol Status:
Protocol Version/Date:	Spatial Extent (Scale): Forest
Protocol Agency:	Units of Measure: acres

Priority Question 1 (uncertainty associated with management assumptions):	High
Priority Question 2 (disparity between existing and desired conditions):	High
Priority Question 3 (management activities likely to affect resources of concern):	High
Priority Question 4 (serious consequences from not knowing resource conditions):	High
Priority Question 5 (monitoring responds to a key issue):	High
Priority Question 6 (question can be cost effectively answered):	High

Priority Rationale: High levels due to lack of historic success in achieving this objective; large difference between current and DFC; regional impacts if lose habitat on GM; risk of loss of habitat if don't monitor (short-lived condition); major WL and veg issue during revision; easy to answer as it gathers data already reported by program areas (WL, Fire)

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

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

Reference & Desired Values: Current values for permanent upland openings are listed in FEIS; desired values are listed in Table 2.2-1 in revised Plan;

References (Literature Cited): see FEIS

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

Fiscal Year Scheduled: 2011 **Cost Per Decade (\$1,000):**

Reporting Frequency: 5 Years

Category: Vegetation

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
Data Collection Logistics:	work with WI Bio and Fire folks to identify acres treated for this habitat
Required in-house Coordination:	WL Bio, Fire
Data Storage:	FSVeg?
Data Storage Hyperlink:	
Responsibility:	Ecologist, WL Bio
Cooperators:	

Item # 18

Monitoring Item Name: Late-successional forest

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

Protocol Name: **Protocol Status:**

Protocol Version/Date: **Spatial Extent (Scale):** Forest

Protocol Agency: **Units of Measure:** acres

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Generally forests will keep aging and developing late successional characteristics regardless of what we do; but the gap between current and desired is large, and it was a public issue during revision, and active management to enhance these characteristics is uncharted territory in the NE. Gathering data on the acres in the old age class is easy because it's simply a CDS query - the same is true for acres treated - it's based on reporting; determining the acres on the ground with late successional indicators may be more complicated - could be done in association with Long Term Monitoring Plots...

Priority within Program: Medium

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

Data Collection Method Hyperlink:

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

Sample Unit: plot

Frequency of Measurement: 5 Years **Precision and Reliability:** Class B

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.

Reference & Desired Values:

we currently suspect, based on forest age, that the occurrence of late successional characteristics are low; we expect that inventory, monitoring, and modeling will help us to test this hypothesis and predict how long it will take via natural succession for these characteristics to develop, and what a "desired value" would be

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$4,000

Fiscal Year Scheduled: 2011 **Cost Per Decade (\$1,000):** \$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.

Data Collection Logistics: Need to coordinate with LT Monitoring Plot exercise; also with Silvexam field inventory folks to train in LS indicator ID

Required in-house Coordination: FM Team, SWA Team

Data Storage: FSVeg

Data Storage Hyperlink:

Responsibility: Ecologist

Cooperators:

Item # 20

Monitoring Item Name: Uneven-aged Management

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 suitable 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

Protocol Name:

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale): Forest

Protocol Agency:

Units of Measure: acres

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Generally forests will become more uneven-age over a long time through natural succession; however we made a commitment in the plan in response to a revision issue that we would increase uneven-age management, and there is little of the Forest now that is in this condition - we can make that change more quickly than through natural processes; this is an easy one to monitor because it tracks reporting that already happens and involves queries of existing databases

Priority within Program: Medium

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

Data Collection Method Hyperlink:

Sample Design: N/A

Sample Unit:

Frequency of Measurement: 5 Years

Precision and Reliability: Class A

Analysis Method: Compare acres with uneven-age Rx and acres harvested with uneven-age mgmt to the 20% threshold identified in the revised Plan

Reference & Desired Values: Desired values are that at least 20% of lands suitable for timber management use uneven-aged systems to create multi-age conditions. Current condition (1987-2001 average) is 32% of harvest acres; unknown what proportion have uneven-age Rx.

References (Literature Cited):

Category: Vegetation

Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$300
Fiscal Year Scheduled:	2011	Cost Per Decade (\$1,000):	\$600
Reporting Frequency:	5 Years		
Estimated Cost - Explanation:	estimate no more than a day of a person's time to calculate each year.		
Data Collection Logistics:	work with Fm Team during reporting period to ensure that harvest acres are broken out by method and that CDS can be queried for Rx		
Required in-house Coordination:	FM Team		
Data Storage:	FsVeg?		
Data Storage Hyperlink:			
Responsibility:	Ecologist & Silviculturist		
Cooperators:			

Item # 50

Monitoring Item Name: Trends in Vegetative Community Composition (site-level scale)

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 vegetation 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, invasive species and other environmental 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 shrub 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

Protocol Name: Forest Inventory and Analysis (FIA) **Protocol Status:** Approved

Protocol Version/Date: 2002 **Spatial Extent (Scale):** National

Protocol Agency: Forest Service **Units of Measure:** Plant presence/absence

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): High

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: If vegetative composition on GMNF changes over time caused by climate change, acid deposition or other environmental problems, management activities will need to be adjusted to meet changed forest environmental conditions to help mitigate the changed condition through adjusted regeneration harvests. A failure to do so from a lack of quantification of the change tree health conditions that will take place could result in failure of regeneration after timber harvests (including plantings) or managing for the wrong species, wasted money trying to protect sensitive species for which the habitat no longer exists on the Forest, and failure to recognize that species that are migrating onto the Forest.

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design: The number of replicates 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 protocols).

Sample Unit: Sample Unit: Northern Hardwoods Forest Type
Determining the spatial distribution of sampling sites is in progress.

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

Analysis Method: Using Forest Inventory and Analysis (FIA) protocols 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.

Reference & Desired Values: The initial plot establishment and data collection will establish baseline data. Subsequent sampling on a 5 year sampling frequency will then characterize and quantify vegetation composition changes as they take place over time. It is a given that it will be impossible to prevent species composition change given the expected climate change. Therefore, the desired value will be simply to have full vegetation cover, as is now found on the GMNF. The changes in composition will be both indirectly caused (climate change and acid deposition), or directly caused (accidental or intentional introduction of invasive species).

References (Literature Cited): Bakkenes, M., J. R. M. Alkemade, F. Ihle, R. Leemansand, and J. B. Latour. 2002. Assessing effects of forecasted climate change on the diversity and distribution of European higher plants for 2050. *Global Change Biology* 8:390-407.

Bartlein, P. J., C. Whitlock, and S. L. Shafer. 1997. Future climate in the Yellowstone National Park region and its potential impact on vegetation. *Conservation Biology* 11:782-792.

Brubaker, L. B. 1986. Responses of tree populations to climate change. *Vegetatio* 67:119-130.

Davis, M. B. 1989. Lags in vegetation response to greenhouse warming. *Climate Change* 15:75-82.

Davis, M. B., and R. G. Shaw. 2001. Range shifts and adaptive responses to Quaternary climate change. *Science* 292:673-679.

Graham, R. L., M. G. Turner, and V. H. Dale. 1990. How increasing CO2 and climate change affects forests. *BioScience* 40:575-587.

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$27,000

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$126,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Part of LEMP. The costs for this item includes 45% of the total cost to establishment 20 plots over 4 years, plus data measurement (except tree health info) in the year of establishment: 2007 (\$0); 2008 establish and measure 5 plots (\$27,000); 2009 establish and measure 5 plots (\$27,000); 2010 establish and measure 5 plots (\$24,750); 2011 establish and measure 5 plots (\$22,500); 2012 (\$0); 2013 re-sample 10 plots @ \$2475 each (\$24,750); 2014 re-sample 10 plots @ \$2475 each (\$24,750). No costs in years 2015-2017.

Data Collection Logistics: To be developed.

Required in-house Coordination:

Data Storage: Data to reside in NRIS databases.

Data Storage Hyperlink:

Responsibility: Soil Water Team

Cooperators: Vermont Monitoring Cooperative
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Diane Burbank, Ecologist, Middlebury Station, dburbank@fs.fed.us

Item # 58

Monitoring Item Name: Stocking Level

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:

Protocol Name:

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale):

Protocol Agency:

Units of Measure:

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Stocking is a legal requirement

Priority within Program: High

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

Data Collection Method Hyperlink:

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.

Sample Unit: The sample unit is the stand, measured in acres.

Frequency of Measurement: Annually **Precision and Reliability:**

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

Reference & Desired Values: A stand must be 70% stocked to meet FSH 2409.26b standards.

References (Literature Cited):

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

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$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.

Data Collection Logistics:

Category: Vegetation

Required in-house Coordination:

Data Storage: Summary data will be stored in FACTS.

Data Storage Hyperlink:

Responsibility: Forest Silviculturist

Cooperators:

Item # 57

Monitoring Item Name: Shelterwood with Reserves

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

Detailed Monitoring Question: Can the shelterwood 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 quality, 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 established 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.

Protocol Name:

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale): Mult-district

Protocol Agency: Forest Service

Units of Measure:

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): High

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: This was a Forest Plan appeal item in 1986 and in 2006.

Priority within Program: Medium

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit: Stand

Frequency of Measurement: 5 Years

Precision and Reliability:

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.

Reference & Desired Values: 1. tree health, 2. tree value growth, 3. uneven-aged structure objectives, 4. visually quality

objectives.

References (Literature Cited):

Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$500
Fiscal Year Scheduled:	2011	Cost Per Decade (\$1,000):	\$1,000
Reporting Frequency:	5 Years		

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

Data Collection Logistics: The data is stored on a floppy disc and also a hardcopy is stored in the 2470 permanent files maintained by the Forest Silviculturist.

Required in-house Coordination:

Data Storage: floppy disc and hardcopy. Eventually the data can be stored in the FSVeg database.

Data Storage Hyperlink:

Responsibility: Forest Silviculturist

Cooperators:

Item # 55

Monitoring Item Name: Regeneration Harvest Opening Size

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 quantity of openings by habitat types. This is a required Forest Plan monitoring item. It helps whether we have met standards for maximum opening size and scenic integrity.

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: Quantitative 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

Protocol Name: Harvest Opening Size

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale): Forest

Protocol Agency: Forest Service

Units of Measure: Acres

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: This is a required Forest Plan monitoring item.

Priority within Program: High

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.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years

Precision and Reliability:

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

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$4,000

Fiscal Year Scheduled: 2011 **Cost Per Decade (\$1,000):** \$8,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation:

Category: Vegetation

Data Collection Logistics:

Required in-house Coordination:

Data Storage: CDS or FACTS data base

Data Storage Hyperlink:

Responsibility: Forest Silviculturist

Cooperators:

Item # 13

Monitoring Item Name: Conversion of hardwoods to mixedwood and softwoods

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 coverion 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

Protocol Name:

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale): Forest

Protocol Agency:

Units of Measure: acres

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: large difference between current condition and DFC; impacts of allowing this gap to close through natural processes not a big deal; not a big revision issue; may have impacts related to spruce decline or deer wintering area management; very low cost because built on reporting from timber reports.

Priority within Program: Low

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:** Class A

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

Reference & Desired Values: Current values for mixedwood and softwood are listed in FEIS; desired values are listed in Table 2.2-1 in revised Plan;

References (Literature Cited): see FEIS

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

Fiscal Year Scheduled: 2011 **Cost Per Decade (\$1,000):**

Reporting Frequency: 5 Years

Category: Vegetation

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

Data Collection Logistics:

Required in-house Coordination: Silviculturist and/or whoever does reporting of harvesting for FMT

Data Storage: CDS/FSVeg

Data Storage Hyperlink:

Responsibility: Forest Silviculturist & Ecologist

Cooperators:

Item # 14

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

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

Protocol Name:

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale): Forest

Protocol Agency:

Units of Measure: acres

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: the gap between current and DFC, the degree of uncertainty associated with getting oak regeneration, the risks to loss of a valued mast source and habitat for rare plants, the high level of attention associated with the new Escarpment MA and use of fire there, and that fact that this item simply counts acres of activities reported by various program areas (fire, timber, wildlife, botany) argue for a high level of priority

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years

Precision and Reliability: Class A

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.

Reference & Desired Values: Current values for oak forest types are listed in FEIS; desired values are listed in Table 2.2-1 in revised Plan;

References (Literature Cited): see FEIS

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$300

Fiscal Year Scheduled: 2011 **Cost Per Decade (\$1,000):** \$600

Category: Vegetation

Reporting Frequency:	5 Years
Estimated Cost - Explanation:	estimate no more than a day of a person's time to calculate each year.
Data Collection Logistics:	
Required in-house Coordination:	Silviculturist and/or whoever does reporting of harvesting for FMT; Fire Team (for reporting), WL Bio (for reporting)
Data Storage:	FSVeg?
Data Storage Hyperlink:	
Responsibility:	Forest Ecologist
Cooperators:	

Item # 15

Monitoring Item Name: Oak Regeneration

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

Protocol Name:

Protocol Status:

Protocol Version/Date:

Spatial Extent (Scale): Forest

Protocol Agency:

Units of Measure: acres

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: the gap between current and DFC, the degree of uncertainty associated with getting oak regeneration, the risks to loss of a valued mast source and habitat for rare plants, the high level of attention associated with the new Escarpment MA and use of fire there, and the fact that this item simply counts acres of activities reported by various program areas (fire, timber) argue for a high level of priority

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: 5 Years

Precision and Reliability: Class B

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.

Reference & Desired Values: there is a large gap between the acres of oak existing (FEIS) versus desired, and between mature oak stands and those likely to continue as oak.

References (Literature Cited): FEIS

Category: Vegetation

Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$300
Fiscal Year Scheduled:	2011	Cost Per Decade (\$1,000):	\$600
Reporting Frequency:	5 Years		
Estimated Cost - Explanation:	estimate no more than a day of a person's time to calculate each year.		
Data Collection Logistics:	need to work with those reporting stocking surveys to query for oak regen success, and those identifying cultural needs to report on what activities were done for oak		
Required in-house Coordination:	TSI Coordinator, Silviculturist, Ecologist, Fire		
Data Storage:	FSVeg?		
Data Storage Hyperlink:			
Responsibility:	Ecologist & Silviculturist		
Cooperators:			

Item # 19

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

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

Protocol Name:	Protocol Status:
Protocol Version/Date:	Spatial Extent (Scale): Forest
Protocol Agency:	Units of Measure: acres

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): High

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Age class diversity, and the general low levels of some age classes and high levels of others, was a big revision issue; not knowing how age class diversity is changing could have serious consequences for our meeting viability objectives for species that rely on certain age classes; forest management has the biggest and quickest influence on age class diversity compared to natural processes; this is simple to answer in that it is a query of existing databases that take into account activities that have changed ages of stands

Priority within Program: High

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

Data Collection Method Hyperlink:

Sample Design: See Silvexam handbook

Sample Unit:

Frequency of Measurement: 5 Years **Precision and Reliability:** Class B

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

Reference & Desired Values: current values are in FEIS; desired values are in table 2.2-2 of revised Plan

References (Literature Cited): see FEIS

Category: Vegetation

Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$300
Fiscal Year Scheduled:	2011	Cost Per Decade (\$1,000):	\$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		
Data Collection Logistics:	coordinate with FMT to ensure that activities and Silvexam data are entered promptly, and that rules fo changes in year of origin in response to activities is applied consistently		
Required in-house Coordination:	FM Team		
Data Storage:	FS Veg		
Data Storage Hyperlink:			
Responsibility:	Ecologist and Silviculturist		
Cooperators:			

Item # 52

Monitoring Item Name: Forest-wide Water Quality Monitoring

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

Detailed Monitoring Question: What is the existing status of water quality on the GMNF, and how are our management activities affecting water quality? (Note: This monitoring incorporates annual macroinvertebrate 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 populations 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.

Protocol Name: VT Dept. of Environmental Conservation Field Methods Protocol **Protocol Status:** Approved

Protocol Version/Date: 1989 **Spatial Extent (Scale):** State of VT

Protocol Agency: State of Vermont **Units of Measure:** Multiple units

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Water quality is an extremely important component of forest ecosystems. It is a primary goal of the Forest Service to protect water quality and aquatic communities, while conducting multiple use management. In addition, maintaining water quality is very important to the public. Scoping concerns about water quality come from the public on nearly every project involving harvesting, ski area expansion, snowmobile trail improvement, and other projects with significant soil disturbance.

Priority within Program: High

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.

Data Collection Method Hyperlink:

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?

Sample Unit: Varies by measure. See GMNF Water Quality Monitoring Plan, 2006-2009.

Frequency of Measurement: Annually **Precision and Reliability:** Class A

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.

Reference & Desired Values: Streams/lakes above 2500 ft. must meet Vermont's Water Quality Standards for Class A Waters, and streams/lakes below 2500 ft. must meet the standards for Class B Waters. Water quality on the GMNF usually meets or exceeds standards, and our management activities typically have minor effects on water quality. However, monitoring of selected streams/ponds each year is warranted because water quality is so important, and the public is concerned about its protection.

References (Literature Cited): Vermont's Water Quality Standards, section 3-01 and 3-02.

Last Year Accomplished:		Cost for Year Scheduled (\$1,000):	\$4,000
Fiscal Year Scheduled:	2007	Cost Per Decade (\$1,000):	\$156,000
Reporting Frequency:	Annually		

Estimated Cost - Explanation: Annual cost = \$3000 for water testing via contract, plus \$1000 for equipment

Data Collection Logistics: Hal Bell - Water sample collection and initial testing; mailing of samples to the State.

Required in-house Coordination: Kathy Donna - data compilation and analysis; purchase of equipment and supplies. Kathy also does annual agreement with the State for macroinvertebrate monitoring. Nancy B. coordinates annual Program funding.

Data Storage: Data is currently stored in an Excel database maintained by Kathy Donna on her C-drive. Data will be permanently moved to the NRIS Water Module when it is operational on the Forest.

Data Storage Hyperlink:

Responsibility: Soil/Water Team. Specifically, Hal Bell - Water sample collection and initial testing; mailing of samples to the State. Kathy Donna - data compilation and analysis; purchase of equipment and supplies.

Cooperators: State of Vermont, Agency of Natural resources, Dept. of Environmental Conservation, Water Quality Division, Biomonitoring and Aquatic Studies Section.

Item # 66

Monitoring Item Name: Wild and Scenic Rivers

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

Protocol Name: **Protocol Status:** Draft

Protocol Version/Date: **Spatial Extent (Scale):** Forest Wild & Scenic Rivers

Protocol Agency: **Units of Measure:** number, acres

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Monitoring is mandated by LRMP monitoring tables .

Priority within Program: Low

Data Collection Method: INFRA; Data will be provided by INFRA as INFRA data is available linked spatially

Data Collection Method Hyperlink: <http://i-web.wo.fs.fed.us>

Sample Design:

Sample Unit: Various

Frequency of Measurement: Annually **Precision and Reliability:** Class A

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.

Reference & Desired Values: Current value is all eligible rivers have preserved ORVs; Desired value is to maintain eligible rivers' ORVs.

References (Literature Cited):

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

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$10,000

Reporting Frequency: 5 Years

Estimated Cost - Explanation: Staff cost of analyzing INFRA data and comparing to Plan requirements for eligible rivers

Data Collection Logistics:

Category: Wild & Scenic Rivers

Required in-house Coordination: recreation, trails

Data Storage:

Data Storage Hyperlink:

Responsibility: Wilderness Program Coordinator

Cooperators:

Item # 41

Monitoring Item Name: Wilderness Areas Managed to Standard

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>.

Protocol Name: 10 YWSC **Protocol Status:** Approved

Protocol Version/Date: 2006 **Spatial Extent (Scale):** Forest Wilderness Areas

Protocol Agency: Forest Service **Units of Measure:** wilderness areas managed to standard

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): Medium

Priority Rationale: Monitoring is mandated by national standards and systematically applied across all FS wilderness areas; monitoring item covers large part of wilderness program.

Priority within Program: High

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

Data Collection Method Hyperlink: <http://www.wilderness.net/index.cfm?fuse=NWPS&sec=manageFS>

Sample Design: Various- see hyperlink

Sample Unit: Various

Frequency of Measurement: Annually **Precision and Reliability:** Class B

Analysis Method: Various

Reference & Desired Values: Current condition is one wilderness area managed to standard. Desired condition is all wilderness areas managed to national standards.

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$100,000

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

Reporting Frequency: Annually

Category: Wilderness

Estimated Cost - Explanation: 70% of annual wilderness program of work is focused on this monitoring item

Data Collection Logistics:

Required in-house Coordination: Coordinate with air, soil, water, fire, recreation, trails, special uses, botany programs.

Data Storage: INFRA WILD

Data Storage Hyperlink: <http://i-web.wo.fs.fed.us>

Responsibility: Wilderness Program Coordinator

Cooperators: Green Mountain Club, Vermont Monitoring Cooperative

Item # 39

Monitoring Item Name: Wilderness Character: Solitude

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

Protocol Name: Wilderness Character Monitoring **Protocol Status:** In Review

Protocol Version/Date: 2006 (Draft) **Spatial Extent (Scale):** Forest Wilderness ar
200

Protocol Agency: Forest Service **Units of Measure:** acres, # of visits

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: The Wilderness Act and subsequent legislation direct the Forest Service to manage wilderness to provide opportunities for solitude or primitive and unconfined recreation.

Priority within Program: Medium

Data Collection Method: NVUM, GIS, Register Sheets

Data Collection Method Hyperlink: <http://fs.fed.us/recreation/programs/nvum/>

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

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

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs will be for GIS analysis, NVUM, register sheet collection and analysis

Data Collection Logistics:

Category: Wilderness

Required in-house Coordination: recreation, trails

Data Storage: INFRA-Wild

Data Storage Hyperlink: <http://i-web.wo.fs.fed.us>

Responsibility: Wilderness Program Coordinator

Cooperators: Green Mountain Club

Item # 40

Monitoring Item Name: Wilderness Character: Primitive Recreation

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, solitude, and 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)

Protocol Name:	Wilderness Character Monitoring	Protocol Status:	In Review
Protocol Version/Date:	2006 (Draft)	Spatial Extent (Scale):	Forest Wilderness ar eas
Protocol Agency:	Forest Service	Units of Measure:	# of recreation facilities, # of miles

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: The Wilderness Act and subsequent legislation direct the Forest Service to manage wilderness to provide opportunities for solitude or primitive and unconfined recreation.

Priority within Program: Medium

Data Collection Method: INFRA

Data Collection Method Hyperlink: <http://i-web.wo.fs.fed.us>

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

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

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs will be for INFRA data analysis

Data Collection Logistics:

Category: Wilderness

Required in-house Coordination: recreation, trails, special uses

Data Storage: INFRA-Wild

Data Storage Hyperlink: <http://i-web.wo.fs.fed.us>

Responsibility: Wilderness Program Coordinator

Cooperators: Green Mountain Club

Item # 42

Monitoring Item Name: Wilderness Field Presence

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.

Protocol Name:	Protocol Status:	Approved
Protocol Version/Date:	Spatial Extent (Scale):	Forest Wilderness Ar
Protocol Agency:	Units of Measure:	staff days, miles of boundary, number of public contacts

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Medium

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Field presence and education and outreach are necessary cornerstones of wilderness awareness and preservation.

Priority within Program: Medium

Data Collection Method: Ranger observation sheets for field data; Public outreach contact records (classroom talks outside wilderness areas)

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$7,000

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$70,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Estimated this monitoring takes 5% of wilderness program time & costs

Data Collection Logistics: Need to develop database, maintain field staff levels

Category: Wilderness

Required in-house Coordination: Forest education & outreach coordinator, law enforcement officers, lands staff

Data Storage: Access database

Data Storage Hyperlink:

Responsibility: Wilderness Program Coordinator

Cooperators: Wilderness Outfitter/Guides

Item # 43

Monitoring Item Name: Wilderness Character: Untrammelled

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

Protocol Name:	Wilderness Character Monitoring	Protocol Status:	In Review
Protocol Version/Date:	2006 (Draft)	Spatial Extent (Scale):	Forest Wilderness Areas
Protocol Agency:	Forest Service	Units of Measure:	management actions

Priority Question 1 (uncertainty associated with management assumptions): Medium

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern):

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Untrammelled wilderness character monitoring element not as big an issue in Eastern wilderness areas as other wilderness character monitoring elements.

Priority within Program: Medium

Data Collection Method: Wilderness management actions that impact untrammelled nature of wilderness will be monitored through internal scoping.

Data Collection Method Hyperlink: <http://www.wilderness.net/index.cfm?fuse=W/C>

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

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

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Cost of INFRA WILD data entry

Data Collection Logistics:

Required in-house Coordination: Forest-wide

Data Storage: INFRA WILD

Data Storage Hyperlink: <http://i-web.wo.fs.fed.us>

Responsibility: Wilderness Program Coordinator

Cooperators:

Item # 38

Monitoring Item Name: Wilderness Character: Undeveloped - Inholdings

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

Protocol Name: Wilderness Character Monitoring

Protocol Status: In Review

Protocol Version/Date: 2006 (Draft)

Spatial Extent (Scale): Forest Wilderness ar
ees

Protocol Agency: Forest Service

Units of Measure: acres

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Low

Priority Question 4 (serious consequences from not knowing resource conditions): High

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: The Wilderness Act and subsequent legislation direct the Forest Service to manage wilderness for undeveloped recreational opportunities. Inholdings can potentially adversely affect wilderness values in surrounding areas.

Priority within Program: Medium

Data Collection Method: GIS ALP files

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

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

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs will be for ALP analysis

Data Collection Logistics:

Required in-house Coordination: lands, special uses,

Category: Wilderness

Data Storage: INFRA-Wild
Data Storage Hyperlink: <http://i-web.wo.fs.fed.us>
Responsibility: Wilderness Program Coordinator
Cooperators:

Item # 44

Monitoring Item Name: Wilderness Character: Natural (Human Threats)

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 statistic 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

Protocol Name:	Wilderness Character Monitoring	Protocol Status:	In Review
Protocol Version/Date:	2006 (Draft)	Spatial Extent (Scale):	Forest Wilderness Ar
Protocol Agency:	Forest Service	Units of Measure:	Concentrations, # dams, % acres with NNIS, # non-indigenous fauna

Priority Question 1 (uncertainty associated with management assumptions):	High
Priority Question 2 (disparity between existing and desired conditions):	Low
Priority Question 3 (management activities likely to affect resources of concern):	Medium
Priority Question 4 (serious consequences from not knowing resource conditions):	Medium
Priority Question 5 (monitoring responds to a key issue):	Medium
Priority Question 6 (question can be cost effectively answered):	High

Priority Rationale: Natural wilderness character monitoring element (human threats) not as big an issue in Eastern wilderness areas as other wilderness character monitoring elements.

Priority within Program: Medium

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).

Data Collection Method Hyperlink: [Insert casnet, IMPROVE sites, link NRIS protocol](#)

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$7,000

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$70,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Cost includes field data collection, funding of air and NNIS specialist, and data analysis.

Data Collection Logistics:

Required in-house Coordination: Regional Air Quality specialist, Forest Botanist, Forest Wildlife/Fisheries Biologists, Forest Engineers

Data Storage: INFRA WILD

Data Storage Hyperlink: <http://i-web.wo.fs.fed.us>

Responsibility: Wilderness Program Coordinator

Cooperators: Vermont Monitoring Cooperative, NRCS

Item # 45

Monitoring Item Name: Wilderness Character: Natural -Biophysical Conditions

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 threats?

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 decidew

 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

Protocol Name: Wilderness Character Monitoring **Protocol Status:** In Review

Protocol Version/Date: 2006 (Draft) **Spatial Extent (Scale):** Forest Wilderness Area

Protocol Agency: Forest Service **Units of Measure:** average air quality, # of species

Priority Question 1 (uncertainty associated with management assumptions): High

Priority Question 2 (disparity between existing and desired conditions): Low

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Low

Priority Question 5 (monitoring responds to a key issue): High

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Natural wilderness character monitoring element (biophysical conditions), specifically biodiversity, was determined to be a high priority issue from Forest Plan scoping. Eastern wilderness areas are recognized as having been historically impacted by human activities and current management focuses on protection of natural processes and ecosystems.

Priority within Program: High

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.

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class A

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

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

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$10,000

Reporting Frequency: Annually

Category: Wilderness

Estimated Cost - Explanation: Costs are for data consolidation and entry

Data Collection Logistics:

Required in-house Coordination: Regional air quality specialist, wildlife/fisheries biologists, botanist

Data Storage: INRA-Wild

Data Storage Hyperlink: <http://i-web.wo.fs.fed.us>

Responsibility: Wilderness Program Coordinator

Cooperators: Environmental Protection Agency, Vermont Monitoring Cooperative

Item # 46

Monitoring Item Name: Wilderness Character: Unconfined Recreation

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

Protocol Name: Wilderness Character Monitoring **Protocol Status:** In Review

Protocol Version/Date: 2006 (Draft) **Spatial Extent (Scale):** Forest Wilderness ar

Protocol Agency: Forest Service **Units of Measure:** # of restrictions

Priority Question 1 (uncertainty associated with management assumptions): Low

Priority Question 2 (disparity between existing and desired conditions): Medium

Priority Question 3 (management activities likely to affect resources of concern): Medium

Priority Question 4 (serious consequences from not knowing resource conditions): Medium

Priority Question 5 (monitoring responds to a key issue): Low

Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: The Wilderness Act and subsequent legislation direct the Forest Service to manage wilderness to provide opportunities for solitude or primitive and unconfined recreation.

Priority within Program: Medium

Data Collection Method: Supervisor's Closure Orders and fees for special uses

Data Collection Method Hyperlink:

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

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

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$10,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs will be for data analysis

Data Collection Logistics:

Required in-house Coordination: recreation, trails, special uses, law enforcement

Data Storage: INFRA-Wild

Category: Wilderness

Data Storage Hyperlink: <http://i-web.wo.fs.fed.us>

Responsibility: Wilderness Program Coordinator

Cooperators: Green Mountain Club

Item # 37

Monitoring Item Name: Wilderness Character: Undeveloped - Motorized and Mechanical Transport
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

Protocol Name: Wilderness Character Monitoring **Protocol Status:** In Review
Protocol Version/Date: 2006 (Draft) **Spatial Extent (Scale):** Forest Wilderness ar
Protocol Agency: Forest Service **Units of Measure:** # of authorizations

Priority Question 1 (uncertainty associated with management assumptions): Low
Priority Question 2 (disparity between existing and desired conditions): Medium
Priority Question 3 (management activities likely to affect resources of concern):
Priority Question 4 (serious consequences from not knowing resource conditions): High
Priority Question 5 (monitoring responds to a key issue): High
Priority Question 6 (question can be cost effectively answered): High

Priority Rationale: Motorized and mechanized equipment are traditionally used for trail and shelter maintenance across the Forest. The Wilderness Act and subsequent legislation require the use of the non-motorized management tools and tools that do not diminish undeveloped wilderness quality.

Priority within Program: High

Data Collection Method: Minimum tools analysis / NEPA document
 Emergency Letters to the File

Data Collection Method Hyperlink: <http://wilderness.net/index.cfm?fuse=MRDG>

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$5,000

Fiscal Year Scheduled: 2007 **Cost Per Decade (\$1,000):** \$50,000

Reporting Frequency: Annually

Estimated Cost - Explanation: Costs will be for NEPA analysis, minimum tool analysis, and data consolidation

Category: Wilderness

Data Collection Logistics:

Required in-house Coordination: recreation, trails, special uses, fisheries/wildlife, regional office

Data Storage: INFRA-Wild

Data Storage Hyperlink: <http://i-web.wo.fs.fed.us>

Responsibility: Wilderness Program Coordinator

Cooperators: Green Mountain Club, State of Vermont, Search and Rescue Personnel

Item # 36

Monitoring Item Name: Wilderness Character: Undeveloped - Permanent Improvements

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

Protocol Name:		Protocol Status:	In Review
Protocol Version/Date:		Spatial Extent (Scale):	Forest Wilderness ar 200
Protocol Agency:		Units of Measure:	# of developments

Priority Question 1 (uncertainty associated with management assumptions):	Low
Priority Question 2 (disparity between existing and desired conditions):	High
Priority Question 3 (management activities likely to affect resources of concern):	
Priority Question 4 (serious consequences from not knowing resource conditions):	High
Priority Question 5 (monitoring responds to a key issue):	High
Priority Question 6 (question can be cost effectively answered):	High

Priority Rationale: GMNF wilderness areas have enabling legislation that allows for permanent improvements in contradiction to the 1964 Wilderness Act. We are continuously working with partners to strike the proper balance between these conflicting laws and policies.

Priority within Program: High

Data Collection Method: Various methods such as routine INFRA data collection protocol
Miles of unauthorized trails

Data Collection Method Hyperlink: <http://i-web.wo.fs.fed.us>

Sample Design:

Sample Unit:

Frequency of Measurement: Annually **Precision and Reliability:** Class B

Analysis Method:

Reference & Desired Values:

References (Literature Cited):

Last Year Accomplished: **Cost for Year Scheduled (\$1,000):** \$6,000

Category: Wilderness

Fiscal Year Scheduled:	2007	Cost Per Decade (\$1,000):	\$60,000
Reporting Frequency:	Annually		
Estimated Cost - Explanation:	Costs will be for data consolidation and entry and field monitoring for unauthorized trails		
Data Collection Logistics:			
Required in-house Coordination:	recreation, trails, engineering		
Data Storage:	INFRA-Wild, Wilderness program database and GIS layer		
Data Storage Hyperlink:	http://i-web.wo.fs.fed.us		
Responsibility:	Wilderness Program Coordinator		
Cooperators:	Green Mountain Club		