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Green Mountain National Forest

Monitoring Program Transition Report

Fiscal Years 2006 to 2024



Black Bear Population Monitoring – Manchester Ranger District

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Monitoring Program Transition Report Fiscal Years 2006 to 2024

Green Mountain National Forest

USDA Forest Service, Eastern Region
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Introduction

The revision of the Green Mountain National Forest (GMNF) Land and Resource Management Plan (Forest Plan) was completed in 2006 under the authority of the National Forest Management Act and associated National Forest System Land Management Planning Rule, or planning regulations (36 CFR 219 dated September 30, 1982). The intent of the associated monitoring program (36 CFR 219.12(4)(k)), specifically the annual monitoring and evaluation reporting process, was to determine Forest Plan implementation effectiveness. In other words, it is the basis to determine how well management activities are meeting Forest Plan direction and if any changes to the Forest Plan are warranted.

The development of monitoring questions and associated measurement indicators are driven by one or more Forest Plan components (goals, objectives, desired future conditions, suitability of lands, and forest-wide and management area standards and guidelines). Monitoring questions are designed to provide meaningful information to determine Forest Plan implementation effectiveness, identify trends associated with resource conditions, and note possible project design changes that may foster more effective management implementation. Perhaps most importantly, evaluation of information collected to answer monitoring questions provides Forest Service staff with the basis to determine whether changes are needed to Forest Plan components. These changes can be made through the amendment process to ensure the Forest Plan remains current by adapting to new information and changed conditions.

Annual monitoring and evaluation reports have been completed each year to document results of monitoring starting in fiscal year 2006 until reporting was converted to a biennial schedule in fiscal year 2016. New planning regulations (36 CFR 219 dated April 9, 2012) required the Forest Plan monitoring program to address eight specific monitoring elements (36 CFR 219.12(a)(5)). The GMNF monitoring program was revised in May 2016 to ensure each required element was addressed with at least one monitoring question and associated indicator(s). Other monitoring questions were retained to supplement the required element related monitoring questions.

This monitoring program transition report provides documentation of the evolving GMNF monitoring program from fiscal years 2006 to 2024. The report includes recommended changes to Forest Plan components and site-specific project design to improve overall management direction and implementation.

1. Monitoring Program History

The Forest Plan provides management direction in multiple components including goals, objectives, desired future conditions, and standards and guidelines at the Forest-wide and management area scales. Monitoring and evaluation are separate, sequential activities to determine how well this management direction is being met, and to provide a basis for the periodic evaluation of Forest Plan effectiveness.

The *Green Mountain National Forest Monitoring Program* (Chapter 4 of the Forest Plan) describes what will be monitored and what Forest Service staff expect to learn from information collected. The

Monitoring Program falls into three general areas of focus, depending on whether they examine the implementation or effectiveness of management actions, or the validity of the underlying assumptions on which management is based:

1. Implementation - Is the overall direction in the Forest Plan being implemented? This includes goals and objectives, desired conditions, standards and guidelines, and management area direction.
2. Effectiveness - Are the standards and guidelines working? Are there significant changes in productivity of the land?
3. Validation - Are the assumptions and predicted effects used to develop the Forest Plan accurate?

These three areas of focus are interwoven within the Monitoring Program as a means of measuring success in meeting Forest Plan direction. Using results from monitoring, Forest Service staff can identify possible changes to 1) Forest Plan components to keep the management direction dynamic, relevant, and responsive to changing conditions; and 2) project design to improve implementation of Forest Plan direction.

The Monitoring Program consists of three primary components: 1) Monitoring Plan; 2) Monitoring Implementation Guide and Schedule; and 3) Monitoring and Evaluation Report.

Monitoring Plan

The *Green Mountain National Forest Monitoring Plan* provides a conceptual framework for specific monitoring and evaluation elements as outlined in Chapter 4 of the Forest Plan. It establishes questions to be answered, timeframes for reporting, and indicators for required monitoring topics. Monitoring Plan direction is broad and ties directly to decisions made in the Forest Plan. The Monitoring Plan consists of a set of monitoring questions required by the planning regulations (36 CFR 219.12(a)(5)). It also includes other monitoring questions developed to assist in determining how well management activities are meeting Forest Plan direction.

Monitoring Implementation Guide and Schedule

In addition to the programmatic direction provided in the Forest Plan, Forest Service staff completed the *Green Mountain National Forest Monitoring Implementation Guide* (also referred to as the Monitoring Guide) in June 2007. The Monitoring Guide is a procedural document that is external to the Forest Plan. It describes the Monitoring Plan with detailed information to help Forest Service staff understand and answer the Forest Plan monitoring questions. It includes what resources to monitor, management and monitoring questions to address, and survey methodologies and protocols to follow. The Monitoring Guide is intended to be a flexible component that can change as new methodologies and techniques are developed, or to be more responsive to changing needs and new information. Based on information garnered through the monitoring and evaluation reporting process, the Monitoring Guide has been updated to incorporate suggested changes since 2007.

The *Annual Monitoring Schedule* is linked directly to the Monitoring Guide and provides monitoring time frames (monitoring and reporting frequency), and Forest staff roles and assignments for each fiscal year. Some monitoring items are performed or measured annually, whereas others are scheduled with other time intervals that are determined necessary or appropriate for timely and effective evaluation. The Monitoring Guide and Monitoring Schedule have been incorporated into the same document in 2025 as the basis for the Monitoring Plan starting in 2017.

Monitoring and Evaluation Report

Information derived from the monitoring and evaluation of monitoring questions forms the basis for continuous improvement of the Forest Plan and effective implementation of project activity. Monitoring and evaluation reporting is key for the Responsible Official to determine if and where changes are needed in Forest Plan components, other Forest Plan content, and project design.

The 1982 planning regulations (36 CFR 219.12(4)(k)) required annual monitoring and evaluation reports to provide a forum for the review of current-year findings. The annual reports included the following components:

- Monitoring question addressed
- Monitoring driver (Forest Plan component)
- Background for why the question is important to address
- Monitoring activities completed
- Evaluation and conclusion
- Recommendations

Comparison of results with those from previous years helped identify trends and highlight where management is or is not achieving Forest Plan direction. Annual monitoring and evaluation reports were completed for each fiscal year starting in 2006. Although multiple year annual reports were sometimes combined into a single monitoring and evaluation report, the information was displayed separately for each fiscal year. The last annual monitoring and evaluation report was completed in 2016 covering fiscal years 2014 to 2016.

The 2019 planning regulations required a transition from annual monitoring and evaluation reports to a biennial evaluation of monitoring information (36 CFR 219.12(d)). Although monitoring data continued to be collected annually, a combination of staffing turnover and vacancies, budget constraints, and the covid 19 pandemic contributed to delays in reporting starting in 2017. The first biennial monitoring and evaluation report covering fiscal years 2017 and 2018 was completed in April 2022 but was not published until May 2026. A combined monitoring and evaluation report covering fiscal years 2019 to 2024 was published in August 2026.

The biennial monitoring and evaluation reports include the following components:

- Monitoring Resource Category
- Monitoring Item
- Monitoring Question
- Detailed Monitoring Question
- Monitoring Measurement Indicator(s)
- Monitoring Driver
- Reporting Frequency
- Last Year Reported
- Next Year Scheduled for Reporting
- Background
- Monitoring Activities
- Evaluation and Conclusions
- Recommended Changes (Monitoring Question or Forest Plan Components)

Monitoring Trends

Forest Service staff completed an evaluation of discernable monitoring trends derived from annual monitoring and evaluation reports from fiscal years 2006 to 2013 (*Green Mountain National Forest Monitoring Program Trends Report - Fiscal Years 2006 to 2013* dated August 2015). Information provided by this report helped identify potential changes to Forest Plan components to improve Forest Plan direction. It also identified potential changes to the Monitoring Plan to more effectively track how well management activities are meeting Forest Plan direction.

Monitoring Question Changes (2006 to 2024)

The initial Monitoring Plan and associated Monitoring Guide were developed in conjunction with the Forest Plan revision completed in 2006. The GMNF 2007 Monitoring Guide consisted of 94 individual monitoring item questions covering multiple resources. Starting in 2016 with the Monitoring Program transition required by the 2012 planning regulations, monitoring questions were dropped or revised, or new questions developed to adapt to changed conditions identified by the monitoring and evaluation process. The following sections highlight the major changes made to monitoring questions since 2006. A comprehensive tracked history of all monitoring question changes is documented in the *Green Mountain and Finger Lakes National Forests – Changes to Monitoring Questions from Fiscal Years 2006 to 2024* spreadsheet dated August 2026.

2012 Planning Regulations – Resource Elements Required for Monitoring

The 2012 planning regulations required the Monitoring Program to transition from the program developed under the direction of the 1982 planning regulations. Specifically, the new regulations required the following eight monitoring resource elements to be addressed by at least one monitoring question per element (36 CFR 219.12(a)(5)):

1. Status of select watershed conditions.
2. Status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems.
3. Status of focal species to assess ecological conditions.
4. Status of a select set of ecological conditions that contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern.
5. Status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives.
6. Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area.
7. Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities.
8. The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land (16 USA 1604(g)(3)c)).

Selection of Required Monitoring Questions (May 2016)

Starting in 2015, Forest Service staff reviewed the existing monitoring questions and indicators, past monitoring results, and available scientific literature to determine whether existing questions and indicators appropriately addressed one or more of the required elements.

Based on the review, ten monitoring questions were selected to address the eight required resource elements in May 2016 (Table 1-1). Only one element, which is related to focal species, required a completely new question to be developed. All other elements were addressed by existing questions in

their original version or were modified to improve their efficiency and efficacy.

Table 1-1. Monitoring questions selected to address the required resource elements (May 2016).

Required Element	Monitoring Question	Indicator and Measurement
1. Status of select watershed conditions.	What is the existing status of watershed biological, chemical, and physical integrity on the Forest, and how are our management activities affecting them?	<u>Indicators:</u> - Water quality, biological, and physical attributes <u>Measurements:</u> - Water quality: dissolved oxygen, pH, nitrite, nitrate, total nitrogen, phosphate, temperature, E. coli, turbidity, conductivity, and total dissolved solids - Biological: macroinvertebrate community biometrics, macroinvertebrate percent community composition by major orders, and macroinvertebrate community functional group composition - Physical: stream bankfull channel dimensions (width and depth), substrate composition, substrate embeddedness, canopy cover, streambank condition, immediate upstream use, stream color condition, and wetland hydrology
2. Status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems.	To what extent are management actions and natural processes leading to increased structural diversity within forested stands and across forested landscapes, moving areas toward desired objectives identified under Goal 2 of the Forest Plan?	<u>Indicators:</u> - Forest structure - Management actions with forest structure objectives <u>Measurements:</u> - Number of acres and proportion of each forest type in each age class - Number of acres and proportion of harvest acres treated with uneven-aged management - Number of acres treated explicitly to enhance early successional characteristics - Number of acres treated explicitly to enhance late successional characteristics - Number of acres treated with various methods to explicitly enhance the health, longevity, and/or structural diversity of forested stands at the stand and landscape scales

Required Element	Monitoring Question	Indicator and Measurement
3. Status of focal species to assess the ecological conditions required under § 219.9.	Does the headwater streams ecosystem provide a full array of riparian and aquatic communities and stream channel types supported by the varied physiographic conditions across the Forest?	<u>Indicator:</u> • Brook trout <u>Measurement:</u> • Number of wild brook trout per stream mile
4. Status of a select set of the ecological conditions required under § 219.9 to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern.	What are the population trends for sensitive plants on the Forest and to what extent is management sustaining or enhancing habitat conditions for populations?	<u>Indicator:</u> • Population trends for plants listed as Regional Forester Sensitive Species <u>Measurements:</u> • Number of ramets or genets • Percent reproductive • Spatial extent of population • Number of populations of a species • Ranked condition of populations
5. Status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives.	Is the Forest moving toward the desired future condition for Recreation Opportunity Spectrum (ROS) settings?	<u>Indicator:</u> • Recreation opportunity settings <u>Measurement:</u> • Trends toward desired future condition
	Are we providing high quality recreation services that meet the expectations of the public?	<u>Indicator:</u> • Visitor satisfaction from National Visitor Use Monitoring (NVUM) <u>Measurement:</u> • Mean visitor satisfaction compared to mean importance to visitor
6. Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area.	To what extent are the vegetation components of ecosystems changing over time in the context of climate change, acidic deposition, and non-native invasive species?	<u>Indicators:</u> • Tree health • Ecosystem complexity <u>Measurements:</u> • Biomass productivity, incremental growth, tree survival, and tree decline (foliage density, dieback, crown density) • Changes in vegetation composition, cover, and structure over time
	Are insect and disease levels compatible with objectives for maintaining healthy forest conditions?	<u>Indicator:</u> • Insect or disease infestations <u>Measurements:</u> • Number of outbreaks by species • Acres affected by species

Required Element	Monitoring Question	Indicator and Measurement
7. Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities.	How close are actual resource outputs and services to those projected in the Forest Plan?	<u>Indicator:</u> - Projected outputs for resource activities or practices listed in Table D-5 in the Forest Plan <u>Measurement:</u> - Actual annual outputs for resource activities and practices listed in Table D-5 in the Forest Plan
8. The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land (16 U.S.C. 1604(g)(3)(C)).	How are soil quality and productivity changing in response to forest management?	<u>Indicators:</u> - Soil sustainability - Hydrologic function - Soil productivity <u>Measurements:</u> - Amount of forest floor impacted - Amount of topsoil displacement - Severity of rutted, burned, or compacted soil - Severity of platy/massive soil structures, or puddled soil

Other Retained Monitoring Questions

During the Monitoring Program transition, many other existing monitoring questions were retained or slightly modified for monitoring to supplement the required monitoring questions and to address other Forest Plan components with the overall intent to improve implementation of Forest Plan direction. There were 47 monitoring item questions retained as part of this effort and were included in the 2017 Monitoring Guide ([Appendix A, Table A-1](#)).

2016 Forest Plan Administrative Changes

Substantive changes to the Monitoring Program do not require a plan amendment or plan revision and can be documented as an administrative change. A substantive change made outside of the process for plan revision or amendment may be made only after notice to the public of the intended change and consideration of public comment (36 CFR 219.13(c)(1)). The monitoring questions and indicators to address the eight required resource elements were available for public comment during a 30-day period ending April 29, 2016. Responses received were considered and, in some cases, were used to make minor changes to the proposal, although the same ten questions were retained. The other monitoring questions retained do not require a Forest Plan administrative change given they were only intended to supplement the required monitoring questions and are subject to staffing and funding constraints.

The selected required monitoring questions and associated indicators were specifically incorporated into the GMNF Monitoring Program (Forest Plan, Chapter 4) with a formal Forest Plan Administrative Change dated May 6, 2016.

Re-evaluation of Monitoring Questions (2023 to 2025)

Forest Service staff began to earnestly re-evaluate the Monitoring Program in 2023 to consider monitoring questions that were no longer relevant or providing meaningful information. Resource specialists conducted a review of existing required and other retained monitoring questions selected in 2016 to identify any needed changes using the following process:

- Decide if any monitoring questions should be dropped or modified, or if new questions may be needed to meet the intent of the planning regulations.
- Monitoring questions must be meaningful, feasible, cost effective, and scientifically sound.
- Questions and measurement indicators should be based on one or more Forest Plan components, but not every component needs to have a corresponding monitoring question (36 CFR 219.12(a)(2)).
- Forest Plan components to consider should focus primarily on goals and objectives found in Forest Plan, Chapter 2 (Section 2.2) but also may include Forest-wide standard and guidelines (Section 2.3).
- Focus on the Forest Plan component wording including the subject, action, measurement, and/or desired outcome to understand what it is intended to achieve (outcome) and if there are connected objectives (measurements).
- Determine which Forest Plan components are important to track for measuring important resource trends by using the following criteria to help narrow selected plan components:
 - Required by law
 - Magnitude of departure between existing and desired conditions
 - Degree of uncertainty regarding the available data
 - Assumptions that are outdated or not well validated
 - Magnitude of resource consequences if desired conditions are not achieved

Forest Service staff completed their review and recommendation for proposed monitoring question changes in May 2025 (Table 1-2).

2026 Forest Plan Administrative Changes

The proposed changes were publicly made available for review with a request for comment ending July 7, 2025. All comments were considered, which resulted in some notable changes to the final questions. The final monitoring questions to address required resource elements and non-required questions identified to address other Forest Plan components (the latter referred to as “other monitoring questions”) were completed in May 2026. These monitoring questions are the basis for the Monitoring Program starting in fiscal year 2017 until further changes are made in outgoing years.

The selected monitoring questions and associated indicators were specifically incorporated into the GMNF Monitoring Program (Forest Plan, Chapter 4) with a formal Forest Plan Administrative Change dated May 19, 2026.

Revised Required Monitoring Questions (May 2026)

Table 1-2 lists the ten monitoring questions selected to address the eight resource elements required by the 2012 planning regulations in May 2026.

Table 1-2. Monitoring questions selected to address the required resource elements (May 2026).

Required Element	Monitoring Question	Measurement Indicator(s)
1. Status of select watershed conditions.	To what extent are management activities maintaining or restoring watershed functions?	• Number of sub-watersheds in each watershed condition class • Number of essential projects completed in priority watersheds per year

Required Element	Monitoring Question	Measurement Indicator(s)
2. Status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems.	To what extent are management activities and natural processes leading to increased structural diversity within forested stands and across forested landscapes, moving areas toward desired objectives identified under Goal 2 of the Forest Plan?	• Number of acres and proportion of each forest type in each age class • Number of acres and proportion of harvest acres treated with uneven-aged management • Number of acres treated explicitly to enhance early successional characteristics • Number of acres treated explicitly to enhance late successional characteristics • Number of acres treated with various methods to explicitly enhance health, longevity, and/or structural diversity of forested stands at the stand and landscape scales
	To what extent are management activities conserving or improving water quality?	• Miles of stream and acres of lake/ pond on National Forest System lands by Vermont water quality classification • Ambient Biomonitoring Network stream reach score for a representative subset of stream reaches across GMNF • Implementation and effectiveness monitoring for Best Management Practices (BMPs)
3. Status of focal species to assess the ecological conditions required under § 219.9.	Does the headwater streams ecosystem provide a full array of riparian and aquatic communities and stream channel types supported by the varied physiographic conditions across the Forest?	• Number of wild brook trout (<i>Salvelinus fontinalis</i>) per stream mile
4. Status of a select set of the ecological conditions required under § 219.9 to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern.	What are the population trends for sensitive plants (increasing, decreasing, or stable)? To what extent are management activities affecting conditions for sensitive plant populations?	Population trends for plants listed as Regional Forester Sensitive Species: • Number of ramets or genets • Percent reproductive • Spatial extent of population • Number of populations of a species • Ranked condition of populations

Required Element	Monitoring Question	Measurement Indicator(s)
5. Status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives.	To what extent are management activities providing high quality recreation services that meet the expectations of the public?	- Percent Meets Expectations (PMEs) in National Visitor Use Monitoring (mean visitor satisfaction compared to mean importance). PME data reported for developed facilities, access, services, and feeling of safety in developed sites, undeveloped areas, and designated wilderness. - Trend in number of visitors, visitor satisfaction and changes in visitor participation by activity over 5-year NVUM reporting periods.
6. Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area.	To what extent are insects and disease organisms impacting forest conditions?	Insect or disease infestations: - Number of outbreaks by species - Acres affected by species Trends in outbreak persistence, spread, and associated tree mortality
	Within site plots how are soil/site quality and productivity changing over the long term in response to factors such as acid deposition, climate change, invasive species, and other environmental problems? How are management activities potentially mitigating or exacerbating changes in soils? More specifically: Are soil nutrient levels changing, and are the changes affecting soil/site productivity? What toxins exist in the soil (such as from the atmosphere), and how are they changing in quantity and type over time? Is this affecting productivity?	Within site plots established in wilderness areas measure changes over time for: - Soil quality - Soil nutrient levels, soil organic matter, total soil carbon, and toxins by major horizon - Soil productivity - Forest health - Soil climate - Soil temperature and moisture, depth of freezing, correlated with selected meteorological parameters
7. Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities.	How do actual resource and service accomplishments compare to those projected in the Forest Plan Appendix D, Proposed and Probable Practices?	Actual annual resource and service accomplishments for management activities listed in the Forest Plan, Appendix D, Table D-5.

Required Element	Monitoring Question	Measurement Indicator(s)
8. The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land (16 U.S.C. 1604(g)(3)(C)).	To what extent are management activities impacting soil quality and productivity?	Within the Forest Service Soil Disturbance Monitoring Protocol sampling and monitoring areas including select areas where timber harvest, prescribed fire, and other management activities have been implemented: • Amount of forest floor impacted • Amount of topsoil displacement • Severity of rutted, burned or compacted soil • Severity of platy/massive soil structures, or puddled soil

Revised Other Monitoring Questions

During the 2025 re-evaluation of the Monitoring Program, the non-required (other monitoring questions) selected to supplement the required monitoring questions were revised with the overall intent to improve implementation of Forest Plan direction. There were 28 monitoring item questions retained as part of this effort and are included in the 2025 Monitoring Guide ([Appendix A, Table A-2](#)).

Project Implementation Monitoring

Monitoring site-specific project implementation during or after completion determines if they have been implemented as designed and whether they have achieved the desired results. Monitoring projects also determine whether Forest Plan standards and guidelines, and project specific design features and mitigation measures have been correctly applied and whether they have protected resources as intended. Although this level of monitoring is completed by resource specialists as they visit project sites throughout each fiscal year, they also visit sites as a formal monitoring team on scheduled dates to discuss an interdisciplinary approach to assess implementation effectiveness. Table 1-3 lists the formal site-specific project monitoring field visits conducted by the GMNF monitoring team from fiscal years 2006 to 2024.

Table 1-3. Monitoring field visits conducted during fiscal years 2006 to 2024.

Fiscal Year	Location	Dates
2008	Manchester Ranger District	June 26, 2008
2009	Middlebury/Rochester Ranger Districts	October 16, 2008
2013	Middlebury/Rochester Ranger Districts	May 22 and 23, 2013
2016	Manchester Ranger District	November 5 and 6, 2015
2018	Middlebury/Rochester Ranger Districts	October 22 and 23, 2018
2020	Manchester Ranger District	September 2 and 3, 2020
2022	Middlebury/Rochester Ranger Districts	May 17 and 18, 2022
2023	Manchester Ranger District	September 27 and 28, 2023
2024	Middlebury/Rochester Ranger Districts	September 25 and 26, 2024

Each project site visited is evaluated by the monitoring team using a set of questions designed to answer the following Forest Plan implementation monitoring questions:

1. Did the project move the area or resource toward the Forest Plan desired future condition and/or meet the intent of the purpose/need from the decision document? Did the project accomplish what it was planned to achieve?

2. If no, what is it about the project that did not move toward the desired future condition or achieve what it was planned to do? How could the project be improved to do so?
3. Was the project implemented as designed?
4. If no, what was changed and what was the reason for the change? Were the changes effective, and within the project scope of the analysis and decision including mitigation measures? Were the changes reviewed, reported or documented?
5. Were Forest Plan standards and guidelines followed during project preparation and implementation?
6. If no, what is it about the project that did not meet Forest Plan standards and guidelines and how could it be improved to do so?
7. Should the Forest Plan standards and guidelines be changed or improved as a result of the implementation of this project?
8. If yes, how and why should it change?
9. Were the mitigation measures and/or design criteria included in the project decision followed during project preparation and implementation?
10. If no, what is it about the project that did not include required mitigation measures and/or design criteria and how could it be improved to do so?
11. Were the mitigation measures and/or design criteria effective and achieve their desired intent?
12. If no, what changes or improvements should be made so that they are more effective?
13. Were the applicable Forest Plan standards and guidelines, mitigation measures and/or design criteria included in the project contract or force account instructions, or reviewed with partners or Forest Service staff implementing the project?
14. If no, how could this process be improved?
15. Are there any other specific resource concerns identified from monitoring this project?

2. Recommended Changes to Forest Plan Components

Table 1-4 lists the recommended changes to Forest Plan components to improve Forest Plan direction for more effective management of GMNF resources. These recommendations were derived from monitoring and evaluation reports completed for fiscal years 2006 to 2024, the *Green Mountain National Forest Monitoring Program Trends Report - Fiscal Years 2006 to 2013* dated August 2015, formal and informal Forest Plan implementation monitoring field reviews, and needed changes identified during routine project development, analysis and implementation.

Table 1-4. Recommended changes to Forest Plan components.

Forest Plan Component	Resource	Proposed Change	Rationale	Priority ¹	Recommendation
Goal 2 Age Class Objectives (Table 2.2-2, Age Class Objectives for Suitable Lands)	Age Class Distribution	Adjust regenerating age class objectives to lower levels to reflect realistic management.	Current trends show management approach is not creating enough regenerating age class to meet objectives. If forested areas are only entered every 20 years instead of 10 years, then the abundance of regenerating habitat created would need to be double what is identified in the table to keep proportions within the ranges identified for the other age classes.	Low	Delay until Forest Plan revision.
Goal 2 Age Class Objectives (uneven-age silvicultural systems)	Age Class Distribution	Re-evaluate the objective of having a minimum of 20 percent of suitable lands managed using uneven-age systems.	Actual management implementation trends represent around half of the management used to be uneven-aged silviculture. The forested landscape will have a different character depending on whether it is managed at 20 percent in uneven-age conditions or 50 percent in uneven-age conditions.	Low	Delay until Forest Plan revision.
Goal 2 Fisheries Objectives	Aquatic Population - Streams	Remove Fisheries Objective: <i>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.</i>	Salmon fry stocking last occurred on GMNF in 2013. Forest Service involvement with the Connecticut River Atlantic Salmon Restoration program officially concluded its self-sustaining restoration goals in 2012 after challenges with marine survival, dams, and climate change. In 2023, the managing	Low	Delay until Forest Plan revision.

Forest Plan Component	Resource	Proposed Change	Rationale	Priority ¹	Recommendation
			commission transitioned into the Connecticut River Migratory Fish Restoration Cooperative to focus on other native migratory fish.		
Goal 12 Objective	Catamount Trail Designation	Remove Objective: <i>Complete construction and designation of remaining sections of the Catamount Ski Trail within the GMNF in cooperation with the Catamount Trail Association.</i>	Catamount Trail across NFS lands has been completed.	Low	Delay until Forest Plan revision.
Goal 12 Objective	Comprehensive Trail Planning	Remove Objective: <i>Complete comprehensive trail planning for 100 percent of the Forest.</i>	GMNF Comprehensive Trail Strategy report was completed in 2015.	Low	Delay until Forest Plan revision.
Forest-wide Standards and Guidelines: 2.3.2 Soil, Water, and Riparian Protection and Restoration Standard S-2 2.3.5 Openings Guideline G-1 2.3.10 Fire Management Guideline G-1	Fire	Provide more specificity for implementing prescribed fire to maintain existing wildlife openings.	More effective use of prescribed fire while protecting resources.	Low	Delay until Forest Plan revision.
Goal 21 Objective Forest-wide Standards and Guidelines: 2.3.10 Fire Management	Fire	Provide more specificity managing resources to reduce risks associated with hazardous fuels.	Current direction lacks enough specificity or management emphasis for reducing hazardous fuels.	Low	Delay until Forest Plan revision.
Forest-wide Guidelines: 2.3.5 Openings Guidelines G-1 and G-2	Forest Habitat Composition	Provide more flexibility for permanent opening size. Current Guidelines state permanent openings “should have irregular shapes to provide more interspersions with forested lands and to improve visual quality” and “may exceed maximum size, 30 acres, to address site-specific needs such as beaver flowages”.	Scientific literature indicates larger openings provide more benefit to wildlife. Size of permanent openings has increased over time and numbers of individual openings have decreased. These changes have been made for the practical reason	Low	Delay until Forest Plan revision.

Forest Plan Component	Resource	Proposed Change	Rationale	Priority ¹	Recommendation
			that more individual openings are harder to maintain due to access and cost.		
Forest-wide Guidelines: 2.3.9 Forest Health and Disturbance Processes, Pests, Diseases, and Non-Native Invasive Species G-1, G-2, and G-5	Invasive Species Population	G-1 emphasizes use of basic prevention measures, but is not clear on what these are, does not provide guidance on how to use them, or explain their value. This guideline would be more helpful if it referred to the 2012 Best Management Practices (BMP) for the Eastern Region and recommended implementing the BMP most appropriate for the specific activities undertaken. G-2 directs Forest Service staff to attempt to determine the source of infestation before treatment begins. While that is solid advice (its goal is to prevent immediate reinfestation of a site after it is treated), it is often not possible. Change the wording to "To increase the likelihood of treatment success, if the source of an infestation can be identified, attempt to address it prior to treating the infestation". G-2 encourages restoration of native communities where feasible, but does not define what that is, or how to go about developing restoration plans. Change the wording to "Include restoration, rehabilitation, or revegetation, as defined by Forest Service Manual 2070". G-2 directs the use of herbicides only when other methods are ineffective, but monitoring indicates the most suitable method is often very species-specific and is also influenced by time and budget. Change the wording to "Use the method most likely to be effective given the species, infestation characteristics, and available resources". G-5 suggests prioritization of treatment actions, but that prioritization does not align	Provide more realistic direction for NNIP control	Moderate	Delay until Forest Plan revision.

Forest Plan Component	Resource	Proposed Change	Rationale	Priority ¹	Recommendation
		with what is feasible on the ground. Realistically, the choice of treatments is based on the sources of funding available, the availability of Forest Service staff to identify and carry out priorities, and the need to focus on response to proposed ground-disturbing projects. Retain the first and fifth bullets (prevention and early detection rapid response) remain, but should be reordered so they are first and second, respectively. The last bullet (containing and controlling established infestations) should remain last, and the remaining three should be combined into one bullet that is referred to as "Sites with high dispersal potential or sites we need to protect".			
Glossary	Old Growth Forest	Revise Old Growth Forest definition.	Current definition does not reflect scientific literature, and its ambiguity makes it difficult, if not impossible, to ascertain attributes for actual designation of old growth forest stands.	Low	Delay until Forest Plan revision or when staffing and funding capacity allow.
Forest-wide Standard: 2.3.11 Recreation, General Forest Area Standard S-4 2.3.12 Trails, Non-Motorized, Bicycling Standard S-1 2.3.12 Trails, Non-Motorized, Saddle, Pack and Draft Animals Standard S-1 2.3.12 Trails, Non-Motorized, Dog Sledding and	Recreation	Revise Standards to be in alignment with Code of Federal Regulations (CFR) for enforcement.	CFR enforcement requires areas closed to specific trail uses to be signed. Current Forest policy only provides signs where specific trail use is allowed rather than where it is not allowed.	Moderate	Amend the Forest Plan as soon as practical.

Forest Plan Component	Resource	Proposed Change	Rationale	Priority ¹	Recommendation
Skijoring Standard S-1 2.3.12 Trails, Motorized Vehicles Standards S-1 and S-2					
Forest-wide Standards and Guidelines: 2.3.12 Trails	Recreation	Add Standards and Guidelines to provide direction for the use of e-bikes on NFS lands or trails.	Current Forest Plan direction currently does not provide guidance on the use of e-bikes on NFS lands or trails. This results in potential user conflicts and law enforcement issues.	Moderate	Amend the Forest Plan as soon as practical or when Agency policy is defined.
Forest-wide Standards and Guidelines: 2.3.2 Soil, Water, and Riparian Area Protection and Restoration Standards S-2 and S-3	Soil and Water	Provide more specificity to Standards and Guidelines to better protect resources from use of equipment beyond guidance for timber-associated equipment.	The use of equipment such as UTV, small excavators, or trailers for road access construction for some activities is not characterized as heavy equipment according to current Forest Plan direction.	Low	Delay until Forest Plan revision.
Goal 6 Large Woody Debris Objective	Stream Restoration	Revise large woody debris objectives specific to stream habitat management.	Current large woody debris objectives do not reflect current scientific literature.	Low	Delay until Forest Plan revision.
Forest-wide Standards: Indiana Bat Maternity Roosting Areas Standard S-3, S-4, and S-5	TES Bats	Revise Standards to reflect changes in known distribution of Indiana bat on GMNF, indicate current bat active season, and provide protection to roosting bats that is more consistent with the current guidance provided by the USFWS (Bat Conservation Strategy for Forest Service-Managed Lands of the Eastern United States, 2024).	Current Standards require Indiana bat surveys in areas where known distribution does not occur. The current distribution of Indiana bat maternity roosting habitat are not known to occur south of Rutland, during the summer months. NFS lands adjacent to the Champlain Valley may have maternity roosting habitat at higher elevations than what is documented in the Forest Plan.	Moderate	Amend Forest Plan as soon as practical.
Forest-wide Standard:	Timber	Revise Standard S-1: "When planting or seeding is needed to meet resource objectives, the stock will be genetically	Seed or seedling stock with local origin from Vermont or New Hampshire are often not available	High	Amend the Forest Plan as soon as practical.

Forest Plan Component	Resource	Proposed Change	Rationale	Priority ¹	Recommendation
2.3.4 Timber or Vegetation Management, Tree Improvement Standard S-1		diverse and of local origin from Vermont or New Hampshire” to allow the use of seeds or seedling stock with local origin beyond Vermont or New Hampshire.	in amounts needed to meet reforestation needs.		
Suitability of Lands	Timber	Re-evaluate land base considered suitable for timber production.	Planning regulations per the National Forest Management Act require review of lands identified in the plan as not suited for timber production at least once every 10 years to determine whether conditions have changed so that they have become suitable for timber production. As a result of this 10-year review, the plan may be amended to identify any such lands as suitable for timber production, if warranted by changed conditions (36 CFR 2019 (a)(2)). 11,517 acres of land have been added to the NFS land base from 2006 to 2024. No review of potential changes to the suitable land base has occurred during this time period.	Low	Amend the Forest Plan as soon as practical.
Forest-wide Standards and Guideline: 2.3.2 Soil, Water, and Riparian Area Protection and Restoration Guideline G-10	Wetlands and Vernal Pools	Provide more specificity to Guideline G-10 to clarify the intent and level of discretion for compliance.	Application of Guideline G-10 has caused confusion during project development, analysis and implementation because of its ambiguity and differing interpretations for compliance.	Moderate	Delay until Forest Plan revision. Adequate wetland protection has been ensured through development of project specific design features or mitigation measures.
Forest-wide Standards and Guidelines (Beaver Management)	Wildlife Habitat	Provide Forest Plan direction for managing beaver habitat.	Current Forest Plan direction lacks guidance for managing beaver habitat. Scientific literature indicates beaver habitat is an important ecosystem component	Low	Delay until Forest Plan revision.

Forest Plan Component	Resource	Proposed Change	Rationale	Priority ¹	Recommendation
			supporting diverse wildlife and aquatic species.		

¹ Low = has no impact on ability to manage resources; Moderate = has some impact on ability to manage resources; High = substantial impact on ability to manage resources.

3. Recommended Changes to Site-Specific Project Design

Table 1-5 lists the recommended changes to site-specific project design to improve the implementation of management activities to better meet Forest Plan direction. These recommendations were derived from formal Forest Plan implementation monitoring field reviews conducted by an interdisciplinary monitoring team during fiscal years 2006 to 2024 (Table 1-3).

Table 1-5. Recommended changes to project specific design.

Monitoring Site	Year Monitored	Resource(s) of Concern	Rationale for Recommendation	Recommendation
Moosalamoo National Recreation Area Campground Timber Management Project	2022	Hazard Trees	Contradictory language for project mitigation measures, i.e., there is mitigation to retain snags but also a mitigation to remove hazard trees.	Include clear definitions for hazard trees and snags so mitigations can be applied correctly.
Early Successional Habitat Creation Project (Bully Brook timber sale)	2023	Heritage	Forest-wide 2.3.15 Heritage Resources Standard S-2 and project specific mitigation measures were not fully followed. Skid road construction between units caused some damage to a heritage site. Additionally, a log landing wasn't constructed in the location as planned. Although the location change was made with good intentions to protect soil and water resources, it was constructed close to a heritage site which would have had a higher level of review (shovel testing).	Forest timber staff should better communicate/coordinate with Forest Heritage staff in the implementation process and all protection boundaries should be included on timber sale maps, even if located outside of the proposed units.
Early Successional Habitat Creation Project (Bully Brook timber sale)	2023	Heritage	Diverted water from skid road waterbars and large log landing causes some impact to an adjacent heritage site.	Better communication between Forest Heritage staff and timber sale administer is needed to prevent future occurrences of unintended impacts. In this case, the skid road and log landing should have been relocated away from the heritage site.
Robinson Integrated Resource Project (Camp 5 timber sale)	2024	Heritage	Heritage sites to protect were not included on the timber sale map but were flagged on the ground for protection.	Ensure all heritage sites are included on future timber sale maps.
Multiple projects	2016	Implementation	Not all resource specialists were aware some projects were implemented before they had a chance to ensure application of Forest Plan standards and guidelines or project specific mitigation measures.	Better communication between Forest staff implementing projects and resource specialists to ensure Forest Plan standards and guidelines and project specific mitigation measures are properly applied.

Monitoring Site	Year Monitored	Resource(s) of Concern	Rationale for Recommendation	Recommendation
Moosalamoo National Recreation Area Campground Timber Management Project	2022	Mountain Bike Construction Standards	Unclear language in proposed action to define what mountain bike trail construction standard should be followed.	Project design should be clear mountain bike trails should be constructed to Forest Service standards and not default to IMBA guidelines.
Nordic Project (Root Beer Ridge timber sale)	2009	Recreation (Trails)	Monitoring timber sale activity on a harvest unit revealed some higher than desired impact to a designated trail. Although mitigation measures were specified in the NEPA document to protect the trail, inadequate visual buffers and damage to the trail occurred during harvest activities.	Better understanding of project mitigation measures should be conveyed to sale layout and sale administration staff.
Robinson Integrated Resource Project (Souphouse timber sale)	2022	Recreation (Trails)	Forest Plan S&Gs and project mitigation measures were implemented adequately, but a designated cross country ski trail transected the harvest area and was difficult to discern following harvest activities.	Strive to use designated trails as the sale unit boundary for future sale layout if feasible to avoid unnecessary impacts on trail features.
Dutton Brook II Project (timber sale)	2009	Soil	Monitoring timber sale activity on some harvest units revealed higher occurrence of soil rutting than desired. Observed impacts approached non-compliance with Soil, Water and Riparian Area Protection and Restoration Standard S-3. Although harvest activities occurred during winter months per project specific mitigation measures, some deep rutting was observed due to non-frozen ground conditions.	More attention during timber sale administration to ensure soil protective measures are implemented.
Corporation Brook Road Repair	2013	Soil	Monitoring road repair work along Corporation Brook Road revealed that some areas where soil was disturbed were still bare which did not appear to comply with Soil, Water and Riparian Area Protection and Restoration Guideline G-6 and G-7. It was noted that seeding and mulching did occur but was applied in the previous late fall.	Provide timely monitoring to identify possible remedial action before adverse impacts can occur.

Monitoring Site	Year Monitored	Resource(s) of Concern	Rationale for Recommendation	Recommendation
Somerset Integrated Resource Project (Airstrip timber sale)	2023	Soil	Small groups of leave-trees were designated in areas of poor, shallow soils to prevent equipment damage to those soils. Unfortunately, many of the leave-trees were subsequently blown down, with their uprooting possibly impacting the sensitive soils as much or more so than equipment might otherwise have.	Future sale layout planning should consider sensitive soils when designating areas with harvest units for leave-trees.
Greendale Project	2008	Soil and Water	Monitoring timber sale activity revealed some deviation from soil and water Standards and Guidelines (S&Gs), Acceptable Management Practices (AMPs), and project specific mitigation measures resulting in higher than desired resource impacts. This included greater than desired soil disturbance, rutting of skid roads, erosion, and wetland sedimentation.	Greater presence of sale administration, closer attention to implementation, more timely monitoring, increased staff understanding of S&Gs and AMPs, and better detail of protected resources on timber sale maps. Detailed recommended actions are provided in the <i>Greendale Timber Sale Soil and Aquatic Resource Monitoring Report</i> dated July 2008
Somerset Integrated Resource Project (Grout Pond hut construction)	2023	Soil and Water	The hut design direction in NEPA document lacked the specificity needed to fully understand what was planned for construction and how it was to be accessed during implementation. As a result, soil and water impacts occurred due to access road construction and use (rutting, erosion, and pooling of water).	Future project descriptions including soil and water mitigation measures should include more specificity to guide implementation and ensure compliance with Forest Plan S&Gs.
Dorset/Peru Integrated Resource Project (opening creation as part of Mad Tom timber sale)	2023	Visuals	The shape of the opening was very linear (squared) due to historic homestead/farm boundaries. Mitigation measures were not clearly written, and some specialists were unaware of implementation timing to ensure application of protective measures. For example, visual mitigation measures were poorly written and hard to implement with too much use of “may” language.	For future opening creation or expansion, an effort should be made to design more irregular boundaries and should leave pockets of standing trees. Mitigation measure language needs to be written more clearly and directly and included in one location in the decision document.
Robinson Integrated Resource Project (Swans Mill timber sale)	2022	Water and Wetlands	Stream and wetland buffers were flagged to their edge and did not include their protective buffer area.	Flag stream and wetland protective buffers similar to how heritage sites are flagged.

Monitoring Site	Year Monitored	Resource(s) of Concern	Rationale for Recommendation	Recommendation
Liberty Hill Snowmobile Access Trail Project	2009	Wetlands	Monitoring trail construction activity revealed some deviation from wetland guidelines and trail construction standards. Improper drainage structures, breach of wetland on the private land section of the project, and poorly located trail tread on steep slopes were identified as issues in need of attention to avoid long-term impacts.	Provide training to ensure an understanding of trail construction standards by partner groups charged with implementation.
Manchester Ranger District Permanent Upland Opening Maintenance Project (prescribed burn)	2020	Wildlife	The project migratory bird mitigation measures were difficult to interpret.	Clarify the protocol if a bird nest is found, especially on the day of implementation. How does “take” apply to the action? Consult with the recent Region 9 guidance regarding migratory birds and take.
Moses Pond Trail Bridge Replacements Project	2023	Wildlife Habitat	The western bridge located over/through good beaver habitat where beavers were known to be active. This bridge was designed to withstand beaver activity; however, it may have been beneficial to reroute the trail completely around the wetland.	More in-depth analysis could have improved overall resource outcomes. District staff should reach out and begin communicating with resource specialists as early as possible to better identify opportunities to modify and improve projects in the earliest stages of development.

Appendix A: Non-required Other Monitoring Questions

The Monitoring Program includes other non-required monitoring questions to supplement the monitoring questions selected to address the eight required resource elements. The intent of these questions is to help address Forest Plan components covered by the required monitoring questions and additional Forest Plan components associated with other resource areas of concern. They also provide information to further improve implementation of Forest Plan direction. Non-required monitoring questions are subject to staffing and funding constraints and are a lower priority to complete. They are not subject to the Forest Plan administrative change process required by the 2012 planning regulations and can be revised or dropped, or new questions developed depending on Forest Service staff recommendations.

Table A-1 lists the 47 other non-required monitoring questions retained in May 2016 as part of the Monitoring Program transition process to comply with the 2012 planning regulations. Table A-2 lists the 28 other-required monitoring questions retained in May 2026 as part of the Monitoring Program re-evaluation process.

Table A-1: Non-required other monitoring questions retained during the Monitoring Program transition process (May 2016).

Resource Category	Monitoring Item	Evaluation/ Management Question	Detailed Monitoring Question
1. Air	Air Particulate	To what extent are air quality and atmospheric deposition affecting sensitive components of the forest ecosystem?	What is the composition of particles in the air, and how are the levels of particulates changing over time? How are air quality and atmospheric deposition on the forest changing over time?
2. Aquatic Ecosystems	Fish and Aquatic Organism Passage	To what extent have Standards and Guidelines been applied?	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 transport water, sediment and debris, and allow free movement of resident aquatic life?
3. Aquatic Ecosystems	Fish Habitat and Stream Channel Stability	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?	How are fish habitat and stream channels changing over time?
4. Aquatic Habitat	Sedimentation/ Substrate Embeddedness	To what extent have Objectives been attained?	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?
5. Aquatic Habitat	Water Temperature in Streams	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?	Are summer water temperatures in upland streams suitable to maintain native fish species and have they changed over the planning period?
6. Fire	Fire Agreements	To what extent have Objectives been attained?	How many fire agreements have been developed and maintained with outside partners?

Resource Category	Monitoring Item	Evaluation/ Management Question	Detailed Monitoring Question
7. Fire	Hazardous Fuels	To what extent have Objectives been attained?	To what extent have hazardous fuels been reduced?
8. Fire	Prescribed Fire and Wildland Fire for Resource Benefit	What are the effects of management practices using fire as a resource tool?	Did wildland fires managed for resource benefit and prescribed fires successfully meet objectives set forth in the Forest Plan and the Fire Management Plan? Did the fire function as a natural ecosystem process to restore and/ or maintain natural plant communities? Are the forests actively reintroducing fire into historically fire adapted landscapes?
9. Fire	Wildfire Occurrence	To what frequency do wildfires occur?	How many wildfires occurred on NFS land? How many total acres? How many human-caused wildfires? How many wildfires in the Wildland Urban Interface (WUI)? Is there a Fire Danger Operating Plan in place?
10. Heritage	Heritage Resource Program Objectives	To what extent have Objectives been attained?	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?
11. Heritage	Heritage Resource Site Protection	To what extent have Objectives been attained?	Have Heritage Resources across the Forest been inventoried and protected?
12. Heritage	Heritage Resource Standards and Guidelines	To what extent have Objectives been attained?	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?
13. Human Dimensions	Contract Sizes to Local Economies	To what extent have Objectives been attained?	What is the range of dollar amounts and board feet in contracts? Who has been awarded the contract?
14. Human Dimensions	County Income by Employment Sector	To what extent have Objectives been attained?	To what extent is the GMNF contributing to the economic health of local economies?
15. Human Dimensions	Partnerships Maintenance and Enhancement	To what extent have Objectives been attained?	Are partnerships active and effective on the Forest and are Forest Service personnel participating in partnership activities?
16. Human Dimensions	Payments to Towns	To what extent have Objectives been attained?	What was the amount paid to each town through PILT, 25% fund or Secure Schools? What type of communications have occurred on this topic with each town?
17. Human Dimensions	Teacher Professional Development in Forest Stewardship	To what extent have Objectives been attained?	Did teacher professional development in Forest stewardship occur?

Resource Category	Monitoring Item	Evaluation/ Management Question	Detailed Monitoring Question
18. Invasive Species Populations	Non-native Invasive Species	To what extent are Forest Service management activities contributing toward population viability for native and desired non-native species?	To what extent are non-native invasive species impacting other National Forest resources?
19. Lands	Land Ownership Adjustment	To what extent have Objectives been attained?	To what extent has the Forest's land base been adjusted through purchase, exchange, transfer, interchange, boundary adjustment and donation?
20. Lands	Special Uses - Lands	To what extent have Objectives been attained?	Is the Forest improving its administration of existing authorizations?
21. Program Management	Costs of Plan Implementation	How close are actual costs to projected costs?	To what extent is the Forest providing a mix of products, services and amenities?
22. Program Management	Desired Future Condition	What are the effects of management practices prescribed by the Forest Plan?	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?
23. Program Management	Innovative, Coordinated Management and Energy Conservation	To what extent have Objectives been attained?	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?
24. Recreation	Effects of Vehicle Use Off Roads	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?	What is the effect of snowmobile use on the quality of recreation experienced by other forest users?
25. Recreation	Recreation Facility Maintenance	To what extent have Objectives been attained?	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?
26. Recreation	Scenic Integrity Objectives	To what extent have Objectives been attained?	Has the Forest transitioned from the current Visual Management System to the Scenery Management System?
27. Recreation	Trail Maintenance	Is the quality of the Forest Service trail system being improved through operation and maintenance?	Is the amount of deferred maintenance on the National Forest trail system being reduced?
28. Recreation	Trends in Trail Partnerships	To what extent have Objectives been attained?	How well is the Forest Service using partnerships to assist in the operations and maintenance of the National Forest trail system?

Resource Category	Monitoring Item	Evaluation/ Management Question	Detailed Monitoring Question
29. Recreation	Visual Quality Objectives	To what extent have Objectives been attained?	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)?
30. Soils	Long Term Soil Quality and Soil Productivity Monitoring	Are the effects of atmospheric deposition and climate change resulting in significant changes to productivity of the land?	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? 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?
31. Soils	Soil/Water Standards and Guidelines, Mitigation Measures, and Best Management Practices	To what extent have Standards and Guidelines and Mitigation Measures been applied? How often are BMPs implemented and effective?	Were soil and water standards and guidelines, mitigation measures, and best management practices implemented on selected projects, and were they effective in protecting the soil, water and wetland resources?
32. Terrestrial Ecological Units	Ecological Type Mapping and Representation	To what extent have Objectives been attained?	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?
33. Terrestrial Wildlife Habitat	Wildlife Reserve Trees	To what extent do Forest Service management activities contribute toward restoration and maintenance of habitat for native and desirable non-native species?	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?
34. Terrestrial Wildlife Population	Bicknell's Thrush	To what extent are Forest Service management activities contributing toward population viability for native and desired non-native species?	What is the population trend of Bicknell's thrush on the National Forest System lands and adjacent lands?
35. Terrestrial Wildlife Population	Common Loon	To what extent are Forest Service management activities contributing toward population viability for native and desired non-native species?	Do we have common loons on/near the National Forest System lands? Are they nesting? Are they nesting successfully? Do they need protection or habitat management?

Resource Category	Monitoring Item	Evaluation/ Management Question	Detailed Monitoring Question
36. Terrestrial Wildlife Population	Herptile Sensitive Species	To what extent are Forest Service management activities contributing toward population viability for native and desired non-native species?	What are the population trends of wood turtle, Jefferson salamander, blue-spotted salamander, and four-toed salamander on National Forest System and adjacent lands? Do they need protection or habitat management?
37. Terrestrial Wildlife Population	Peregrine Falcon	To what extent are Forest Service management activities contributing toward population viability for native and desired non-native species?	What is the population trend of peregrine falcons on the National Forest System lands and adjacent lands?
38. Terrestrial Wildlife Population	Threatened, Endangered, and Sensitive Species - Bats	To what extent do Forest Service management activities contribute toward restoration and maintenance of habitat for native and desirable non-native species?	Are management actions adequately protecting ecological conditions required by threatened, endangered, and sensitive bat species known to occur on National Forest System lands?
39. Vegetation	Forest-wide Habitat Composition	To what extent have Objectives been attained?	To what extent are management actions and natural processes moving Forest composition toward desired objectives in table 2.2-1 of the revised Plan?
40. Vegetation	Outputs Accomplished - Volume and Acres of Timber Offered and Sold	How close are actual outputs and services to projected outputs and services?	How do actual outputs compare to those projected in Appendix D, Proposed and Probable Practices, specifically related to timber offered and sold?
41. Vegetation	Rare or Outstanding Natural Areas	To what extent have Objectives been attained?	To what extent are rare and outstanding biological, ecological, or geological features on the Forest being protected, maintained, or enhanced?
42. Vegetation	Stocking Levels	Are harvested lands adequately restocked according to Forest Plan goals?	Are lands adequately restocked within five years of a regeneration harvest or site preparation activities?
43. Vegetation	Suitable Timber Lands	To what extent is timber management occurring on lands suitable for such production?	Are harvests occurring on lands suitable for timber management?
44. Vegetation	Sustainability of Special Forest Product Gathering	To what extent have Objectives been attained?	What types and quantities of special forest products are being gathered annually that require a permit? What products are not allowed to be gathered, and what products are being evaluated for gathering at levels requiring a permit (commercial or personal use)? What products are being gathered at levels that may be unsustainable?
45. Water	Forest-wide Water Quantity and Flow Monitoring	To what extent are environmental stressors and Forest management affecting water quantity and flow timing?	What is the existing status of water quantity and flow timing on National Forest System lands, and how are our management activities affecting them?
46. Wild and Scenic Rivers	Wild and Scenic Rivers	To what extent are eligible Wild and Scenic Rivers managed to preserve their outstandingly remarkable values?	Are agency activities on eligible National Wild & Scenic Rivers consistent with the Outstandingly Remarkable Values for which the river segment was determined eligible?

Resource Category	Monitoring Item	Evaluation/ Management Question	Detailed Monitoring Question
47. Wilderness	Wilderness Areas Managed to Standard	To what extent have Objectives been attained?	How are wilderness areas trending to meet the national Wilderness Stewardship Performance?

Table A-2: Non-required other monitoring questions retained during the Monitoring Program re-evaluation process (May 2026).

Resource Category	Monitoring Item	Management Question	Detailed Monitoring Question
1. Air	Air Particulate	To what extent are air quality and atmospheric deposition affecting sensitive components of the forest ecosystem?	What is the composition of particles in the air, and how are the levels of particulates changing over time?
2. Aquatic Ecosystems	Fish Habitat	How well do Forest Plan components conserve or improve fisheries habitat?	To what extent are management activities conserving or improving fisheries habitat?
3. Aquatic Ecosystems	Stream Function	How well do Forest Plan components provide desirable aquatic organism passage and stream function conditions?	To what extent are management activities ensuring stream crossing structures allow desirable fish habitat and stream function conditions such as aquatic organism passage and passage of water and debris associated with high flows?
4. Fire	Hazardous Fuels	Are fuel treatment activities reducing fuel loads?	To what extent have management activities reduced hazardous fuels?
5. Fire	Prescribed Fire	To what extent is prescribed fire benefitting resources?	Is prescribed fire restoring and/or maintaining desired vegetation composition and structure?
6. Fire	Wildfire Occurrence	To what frequency do wildfires occur?	How many wildfires occurred on National Forest System (NFS) land?
7. Heritage	Heritage Resource Program Objectives	How well do Forest Plan components provide protection and stewardship for significant heritage resources?	How many acres surveyed and how many sites protected during Forest project National Historic Preservation Act, Section 106 clearance?
8. Heritage	Heritage Resource Site Protection	How well do Forest Plan components provide protection and stewardship for significant heritage resources?	How many projects were reviewed under National Historic Preservation Act, Section 106?
9. Heritage	Heritage Resource Standards and Guidelines	How well do Forest Plan components provide protection and stewardship for significant heritage resources?	How many National Historic Preservation Act, Section 110 activities have been completed?
10. Human Dimensions	Local and Regional Economies	To what extent have management activities supported regional and local economies?	What is the range of dollar amounts and board feet in timber sale contracts? Who has been awarded the timber sale contract?
11. Human Dimensions	Partnerships Maintenance and Enhancement	To what extent are partnerships maintained and enhanced?	Are partnerships active and effective to help meet Forest Plan goals and objectives, and are Forest Service staff participating in partnership activities?
12. Human Dimensions	Payments to Towns	To what extent have Forest programs supported regional and local economies?	How much funding was paid to towns through Payment in Lieu of Taxes (PILT)

Resource Category	Monitoring Item	Management Question	Detailed Monitoring Question
			and Secure Rural Schools (SRS) payments?
13. Human Dimensions	Teacher Development and Forest Stewardship	To what extent have Forest programs provided a diverse range of information and education opportunities?	Was educator development or support in forest stewardship offered?
14. Invasive Species Population	Non-native Invasive Species:	How well do Forest Plan components prevent and control the spread of non-native invasive plants?	To what extent are non-native invasive species impacting other Forest resources?
15. Lands	Land Ownership Adjustment	Has Forest land ownership been adjusted to meet future needs and improve management effectiveness?	To what extent has the Forest's land base been adjusted through purchase, exchange, transfer, interchange, boundary adjustment and donation?
16. Lands	Special Uses - Lands	How well do Forest Plan components ensure special use permits are properly administered?	Are special use permit authorizations administered to standard?
17. Program Management	Project Implementation	How well are project activities moving resources toward desired future conditions?	Are project activities improving desired future conditions? Are Forest Plan Standards and Guidelines, and project specific design criteria and mitigation measures effective at achieving desired results?
18. Recreation	Partner Contributions	To what extent are partners contributing to management of recreation facilities and trail systems?	What is the trend in partner contributions towards the improvement, maintenance and operation of the Forest Recreation Sites and Trails System.
19. Recreation	Trail Maintenance	Is the quality of the Forest Service trail system being improved through operation and maintenance?	How many miles of trail are maintained annually and how many trail miles are meeting standard?
20. Terrestrial Ecology	Ecological Type Mapping and Representation	How well do Forest Plan components maintain or restore ecological processes and systems within desired ranges of variability?	What proportion are ecological types on GMNF/FLNF represented within the ecological reference area network?
21. Terrestrial Wildlife Population	Sensitive Species	How well do Forest Plan components maintain and restore habitats to ensure population viability for native and desirable non-native species?	Are management activities ensuring the protection and promotion of Regional Forester Sensitive Species (RFSS) habitats and populations?
22. Terrestrial Wildlife Population	Threatened, Endangered, and Sensitive Bats	To what extent are Forest Service management activities contributing toward population viability for native and desired non-native species?	Are threatened, endangered, and sensitive bat species continuing to persist on the landscape?
23. Vegetation	Forest-wide Habitat Composition	To what extent are management activities maintaining and restoring quality, amount, and distributions of habitats to desired levels?	To what extent are management activities and natural processes moving forest composition and age classes toward Forest Plan objectives (Tables 2.2-1 and 2.2-2)?
24. Vegetation	Outputs Accomplished - Volume and	To what extent are management activities providing sustainable supply of forest products?	How do actual outputs compare to those projected in Appendix D, Proposed and

Resource Category	Monitoring Item	Management Question	Detailed Monitoring Question
	Acres of Timber Offered and Sold		Probable Practices, specifically related to timber offered and sold?
25. Vegetation	Rare or Outstanding Natural Areas	How well do Forest Plan components protect rare or outstanding biological, ecological, or geological areas?	To what extent are rare and outstanding biological, ecological, or geological features being protected, maintained, enhanced, or threatened?
26. Vegetation	Stocking Level	Are harvested lands adequately restocked according to National Forest Management Act requirements?	Are lands adequately restocked within five years of a regeneration harvest or site preparation activities?
27. Wild and Scenic Rivers	Wild and Scenic Rivers	To what extent are eligible Wild and Scenic Rivers managed to preserve their outstandingly remarkable values?	Are management activities within the eligible National Wild and Scenic River Management Area consistent with the Outstandingly Remarkable Values for which each river segment was determined eligible?
28. Wilderness	Wilderness Areas Managed to Standard	To what extent are management activities meeting the intent of the Wilderness Act?	Are wilderness areas trending to meet the national Wilderness Stewardship Performance?