IMPLEMENTATION, MONITORING, & EVALUATION

CHAPTER 5

INTRODUCTION

Chapter 5 provides information to guide putting the Revised Forest Plan into practice, or implemented. One of the most important aspects of implementing the Forest Plan is monitoring and evaluation. Monitoring and evaluation provide information to determine whether programs and projects are meeting Forest Plan direction, and whether the Plan should be amended or revised. This Chapter establishes Monitoring Questions that are to be answered over the course of Forest Plan implementation.

The last section of this Chapter discusses how this Forest Plan may be amended or revised as a result of this monitoring and evaluation.

IMPLEMENTATION

The approval of this Revised Forest Plan establishes direction so that all future decisions in the planning area will include an "interdisciplinary approach to achieve integrated consideration of physical, biological, economic and other sciences" (16 USC 1604(b)). The Forest Plan will be implemented through a series of project-level decisions based on appropriate site-specific environmental analysis and disclosure to assure compliance with the NEPA. The NEPA analysis process begins once these individual projects have been identified.

Common project-level decisions include whether or not, and if so, in what way, timber will be harvested in a given area, a campground will be constructed, or a fisheries structure will be installed. The form of documentation for such analysis will be consistent with the Council of Environmental Quality NEPA Regulations [40 CFR 1500-1508], and Forest Service Manual and Handbook procedures.

The Forest Plan does not contain a commitment to the selection of any specific project. Instead, it determines what types of projects are permissible and under what conditions on different portions of the Forest. For instance, the Forest Plan may determine that portions of specific management areas are suitable for timber production. It does not make decisions on the specifics of any particular timber sale that could occur on lands suitable for timber production. Such decisions must be based on appropriate site-specific analysis and appropriate disclosure during project-level analysis.

The projects chosen to implement this Forest Plan should be those which lead to achieving goals, objectives, and the desired future conditions described in Chapters 2, 3, and 4. There is, however, no specific requirement that a project must contribute to achievement of the goals, objectives, and desired future conditions. Any project that complies with the standards in Chapters 2, 3, and 4 of this document may be selected for implementation. Project-level environmental analyses will tier to the Forest Plan and Final Environmental Impact Statement (FEIS). The FEIS for the Forest Plan is an aid to project-level NEPA compliance.

As described in the Monitoring and Evaluation section of this Chapter, the Interdisciplinary Team will evaluate how the selection of projects is achieving the goals, objectives, and desired future conditions of the Forest Plan.

BUDGET

The Forest Plan provides the basis for developing multi-year program budget proposals. The budget is used for requesting and allocating the funds needed to carry out the planned management direction. Accomplishment of the annual program is the incremental implementation of the management direction in the Forest Plan. Depending on final budgets, outputs and activities in individual years may be significantly different from the objectives in Chapters 2 and 4. Cost and accomplishment data will be utilized to update and revise databases and modify budget proposals.

The Forest program development and budget process consists of evaluating fixed and variable cost activities, and capital investment projects. Fixed cost activities include those necessary to ensure public safety and environmental protection, and to maintain existing capital assets at certain levels of service and availability. Additionally, long-term management planning and resource inventories, general administration (overhead) costs, and other costs that cannot be assessed on a per-unit basis are included in fixed cost activities.

Variable cost activities generally include those with outputs or uses that can be controlled or changed. For instance, certain costs may vary relative to the miles of trail construction proposed in an alternative. Capital investments entail monies spent to provide or improve a facility or product for continued or future use.

In 1995, the George Washington and Jefferson National Forests were administratively combined. The annual budget received is for both National Forests. The estimated budget for this revised Forest Plan is available in Chapter 3 of the FEIS under the Social/ Economic section and in the Process Records.

MONITORING AND EVALUATION

Monitoring and evaluation provide information to determine whether programs and projects are meeting Forest Plan direction, and whether the cost anticipated to implement the Forest Plan coincides with actual costs. Monitoring and evaluation is required by NFMA implementing regulations (36 CFR 219.12(k)) to determine whether requirements of the regulations and Forest Plan are being met.

This Chapter establishes Monitoring Questions that are to be answered over the course of Forest Plan implementation. Monitoring questions address whether the desired conditions, goals and objectives of the Forest Plan are being met and whether Forest Plan standards are effective. Monitoring Questions are part of the Forest Plan and are stated in terms that will direct *what* will be monitored, but are not so specific as to address *how* monitoring will be accomplished.

Monitoring Questions will be further refined during Forest Plan implementation into Monitoring Elements and Task Sheets, which are more detailed, specific and measurable than the Monitoring Questions themselves. Monitoring Elements and Task Sheets may be modified and prioritized to guide monitoring activities over the course of Forest Plan implementation. The Monitoring Summary Table and sample Task Sheet (Appendix G) demonstrate the relationships between Forest Plan Goals, Objectives, Standards and Monitoring Questions, and indicate the nature of Monitoring Elements and monitoring details that are to be further developed during Forest Plan implementation. The Monitoring Summary Table and sample Task Sheet are presented here only for information and may be modified as needed to address changes in needs, priorities, availability of personnel and funding.

The concept of adaptive management is foundational for planning and Forest Plan implementation in a dynamic environment. Regulations require that Forest Plans be revised periodically (36 CFR 219.10(g)). However, Forest Plans may need to be more dynamic to account for changed resource conditions (such as large storms or insect outbreaks), new information or findings of science, or new regulations or policies. An effective monitoring and evaluation program is essential for determining when these needs may exist and for leading to quick resolution of a need for change.

The Monitoring Questions were developed to address three types of monitoring:

- Implementation monitoring: addressing whether the Forest Plan is being carried out.
- Effectiveness monitoring: dealing with whether desired conditions are resulting.
- Validation monitoring: determining if information used in developing the Forest Plan has changed.

Monitoring and evaluation provide information that can be used to keep Forest Plans current. Key results and findings will be used to determine if changes are needed in goals, objectives, standards, the monitoring questions themselves or research needs.

Monitoring and evaluation are distinct activities. The monitoring phase generally includes the collection of data and information, either by observation, direct measurement or compiling data from appropriate sources. Evaluation is the analysis of this data and information, and is used to assess if the Forest Plan is being implemented correctly and whether it needs to be changed. Forest Plan Monitoring and Evaluations will be reported annually in the Forest Monitoring and Evaluation Report.

Monitoring and evaluation may lead to adjustments of programs, projects or activities, changes or amendment to the Forest Plan itself or used to recommend changes in laws, regulations, and policies that affect both the Forest Plan and project implementation (FSM 1922.7).

Forest Plan amendments and revisions should be responsive to changes that affect the Forest Plan, and may be needed at any time if a Forest Plan becomes out of date in some way. Within an adaptive management framework, the need to amend or revise the Forest Plan may result from:

- Recommendations of an interdisciplinary team, based on evaluation and monitoring results;
- Changes in agency policy and regulations;
- Planning errors found during Forest Plan implementation;
- Changes in physical, biological, social, or economic conditions.

The evaluation of findings under the following Monitoring Questions will lead forest managers to these determinations.

MONITORING QUESTIONS

1. Are rare ecological communities being protected, maintained, and restored?

A Forest Plan goal, along with related objectives and standards, is designed to maintain and restore rare communities. To monitor accomplishment of these provisions and the effects

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that overall Forest Plan implementation will have on rare communities, trends in number of occurrences, locations, and conditions, and effects of maintenance and restoration activities will be tracked.

MONITORING QUESTIONS

2. Are landscape and stand level composition, structure, and function of major forest communities within desirable ranges of variability?

Success in maintaining and restoring composition, structure, and function of forest ecosystems within desired ranges of variability is reflected by both changes in forest condition and by levels of management and other effects that are shaping these communities. Monitoring will include tracking the abundance of major forest cover/ community types and levels of management activities conducted to maintain and restore desired conditions. Population trends and habitats of Management Indicator Species will be monitored to help indicate effects of national forest management within selected communities.

Table 5-1. Management Indicator Species Selected For Monitoring Question 2

Management Indicator Species	Reasons for Selection
Hooded warbler	Changes in presence and abundance of hooded warblers in mature mesic deciduous forests will be used to help indicate the effectiveness of management at providing dense understory and midstory structure within these forest communities.
Pine warbler	Trends in presence and abundance of these species in mature pine forest will be used to help indicate effectiveness of management at
Scarlet Tanager	Trends in presence and abundance of these species in drier mid- and late-successional oak and oak-pine forests would be used to help indicate effectiveness of management at establishing desired conditions in these forest communities.

Table 5-2. Management Indicator Species Selected For Monitoring Question 3

Management Indicator Species	Reasons for Selection
Eastern Towhee	Trends in presence and abundance of this species in early-successional forests will be used to help indicate the effectiveness of
Chestnut-sided warbler	Changes in presence of this species in areas that provide high elevation early-successional habitats will be used to indicate effectiveness of management in achieving desired conditions within these sites.
Acadian flycatcher	Trends in presence and abundance of this species in mature riparian forests will be used to help indicate the effectiveness of management
Ovenbird	Trends in presence and abundance of this species in mature deciduous forests will be used to help indicate the effectiveness of management in maintaining desired condition relative to forest interior habitats.

3. Are key successional stage habitats being provided?

Forest goals, objectives, and standards have been established for maintaining a balance between the early, mid-, and late-successional habitat conditions. Some wildlife species

depend on early successional forests, while others depend on late-successional forests. Trends in successional conditions and abundance of key successional habitats, such as high-elevation early successional habitat, mature forest interiors, old growth, and permanent wildlife openings, will be monitored. Population trends of Management Indicator Species selected to help indicate effects of management on successional habitats will be monitored.

4. How well are key terrestrial habitat attributes being provided?

Special habitat attributes such as hard and soft mast, den trees, snags, and downed wood are necessary elements for certain species. A variety of Forest Plan goals, objectives, and standards provide for the protection, restoration, and maintenance of these elements. Trends in the abundance and condition of key terrestrial habitat attributes and associated Management Indicator Species will be monitored.

Table 5-3. Management Indicator Species Selected For Monitoring Question 4

Management Indicator Species	Reasons for Selection
Pileated woodpecker	Trends in presence and abundance of this species across the forest will be used to help indicate the effectiveness of management in

5. What is the status and trend in aquatic habitat conditions in relationship to aquatic communities?

The Forest Plan provides for protection and restoration of riparian ecosystems, wetlands, and aquatic systems and for assuring that aquatic habitat conditions are suitable to maintain native aquatic communities. Water quantity and quality, atmospheric deposition, in-stream large woody debris, and aquatic species passage will be monitored. Population trends for aquatic MIS in relation to the habitat conditions they are selected to represent will be monitored.

6. What are status and trends of forest health threats on the forest?

Table 5-4. Management Indicator Species Selected For Monitoring Question 5

Management Indicator Species	Reasons for Selection
Wild trout	Trends in presence and abundance of wild trout will be used to indicate the effects of acidification of stream systems, and the

Measures designed to control or mitigate negative effects of insects, disease, non-native invasive species, air pollution, and high fuel levels are important aspects of this Forest Plan. Trends in occurrence and effects of air pollutants, wildland fire, insects and diseases, and non-native invasive species will be monitored.

7. What are the status and trends of federally listed species and species with viability concerns on the forest?

Contribution to conservation and recovery of federally listed threatened and endangered species is an important goal of this Forest Plan. Trends in occurrence or abundance of these species will be monitored along with levels of management activities implemented for the purpose of achieving recovery. Some threatened and endangered species have been selected as Management Indicator Species because of their critical dependence on

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national forest management for recovery.

MONITORING QUESTIONS

Maintaining habitat capable of supporting viable populations of native and desired non-native species is also an important goal of the Forest Plan. Many objectives and standards are designed to meet this goal. Monitoring will focus on trends for populations and/or habitats of species of viability concern. Where feasible, species monitoring will often be accomplished by monitoring communities of species (e.g., fish, bats, birds). Individual Management Indicator Species have been selected because their viability is critically dependent on national forest management.

8. What are the trends for demand species and their use?

The Jefferson National Forest provides large public ownership with opportunities for hunting, fishing, wildlife viewing, and collection of special forest products. Monitoring of some game species populations and/or harvest levels will be done in coordination with the Virginia Department of Game and Inland Fisheries (VDGIF) and West Virginia Department of Natural Resources (WVDNR). Some of these species are selected as Management Indicator Species where effects of national forest management are important to meeting public demand, and monitoring assistance from VDGIF and WVDNR is available. Some species that are collected as special forest products will be monitored through management of the permitting process.

Table 5-5. Management Indicator Species Selected For Monitoring Question 7

Management Indicator Species	Reasons for Selection
Peaks of Otter salamander	Trends in populations of this species will be used to indicate effectiveness of management activities designed specifically to meet

9. Are high quality, nature-based recreation experiences being provided and what are the trends?

Table 5-6. Management Indicator Species Selected For Monitoring Question 8

Management Indicator Species	Reason for Selection
Black bear	Trends in harvest levels and hunting demand will be used to help indicate effectiveness of management in meeting public demand for
Wild turkey	Trends in harvest levels and hunting demand will be used to help indicate effectiveness of management in meeting public demand for
White-tailed deer	Trends in harvest levels and hunting demand will be used to help indicate effectiveness of management in meeting public demand for
Wild trout (brook trout, rainbow trout, brown trout)	Trends in harvest levels and fishing demand will be used to help indicate effectiveness of management in meeting public demand for

The Jefferson National Forest offers a unique combination of nature based dispersed recreation, including undeveloped settings, built environments reinforcing natural character, and wildland settings that complement enjoyment of special places. This Forest Plan aims to provide for safe, natural, well designed, accessible, and well-maintained recreational opportunities for all visitors. Monitoring visitor experiences and

the condition of facilities will help gage the effectiveness in meeting this commitment.

10. What is the status and trend of wilderness character?

Wilderness character is comprised of both human and biophysical elements. Monitoring the human elements requires monitoring trends in the human experiences, i.e. solitude, crowding, etc., as well as trends in the use patterns and visitor impacts. User monitoring and surveys will allow for tracking trends among visitors to wilderness, while trailhead use and identification of sites with impacts will allow us to track movement and activities within wilderness and relationships to biophysical effects. Monitoring biophysical elements is important for tracking changes to the natural systems due to natural and human influences within and outside the wilderness. Although there are many components to the biophysical element, air quality is viewed as a basic indicator of wilderness health. Additionally, changes that are occurring in wilderness due to the fire regime, especially in fire dependent communities, will be monitored.

11. What are the status and trend of Wild and Scenic River conditions?

The two main elements in determining the eligibility and suitability of a river for inclusion in the National Wild and Scenic Rivers System are a free-flowing condition and the presence of Outstandingly Remarkable Values. Rivers determined to be eligible, or eligible and suitable, that have not yet been designated by Congress must have those elements protected until a further designation is assigned. Monitoring changes to these elements will help us evaluate our management of these rivers on our forests.

12. Are the scenic and aesthetic values being protected and enhanced?

Scenery is managed by establishing Scenic Integrity Objectives (SIO) consistent with a variety of landscape character themes. Management of scenery is essential in the management of recreational experiences and the quality of the environment. Changes in scenic quality and landscape character of the forest will be monitored.

13. Are heritage sites being protected?

Compliance with the National Historic Preservation Act is essential during implementation of this Forest Plan. The requirement that sites eligible for the National Register of Historic Places be identified and protected before ground disturbing activities occur must be met. Monitoring will be done to assess how well sites are being identified for protection and whether site protection measures are effective in preventing site loss.

14. Are watersheds maintained (and where necessary restored) to provide resilient and stable conditions to support the quality and quantity of water necessary to protect ecological functions and support intended beneficial uses?

This Forest Plan provides for management of watersheds to provide resilient and stable conditions to support the quality and quantity of water necessary to protect ecological functions and support intended beneficial water uses. Numerous best management practices are established as standards for practices to be carrying out during implementation of the Forest Plan. Watershed condition, improvement needs, water quality, and implementation of best management practices will be monitored.

15. What are the conditions and trends of riparian area, wetland and floodplain functions and values?

Riparian ecosystems restoration and management is important to maintain aquatic resources and values. Desired conditions, including the composition and structure of vegetation, equipment limitations, maintaining ground cover and stable stream-banks are

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established in the Forest Plan. Floodplains and wetlands are to be protected. Riparian management practices and standards, ground cover, stream-bank stability, wetland and floodplain status will be monitored.

MONITORING QUESTIONS

16. How do actual outputs and services compare with projected?

RESEARCH NEEDS

The 1982 NFMA implementing regulations require that outputs and services will be monitored and compared to those projected in the Forest Plan. Trends in forest product, mineral leasing and surface rights, access and road conditions, and Forest Plan implementation costs will be tracked and compared to projections made at the time the Forest Plan was developed.

17. Are silvicultural requirements of the Forest Plan being met?

The 1982 NFMA implementing regulations also require monitoring of specific silvicultural requirements. Silvicultural practices, harvest methods, harvest unit size, regeneration establishment, and land suitability for timber productions will be monitored and evaluated to determine if and when changes may be needed.

18. Are Forest Plan objectives and standards being applied and accomplishing their intended purpose?

Periodic review of objectives and standards established in the Forest Plan is called for to assure that desired condition are being achieved and that these requirements will stay current given Forest Plan modifications, changed conditions and new information that accumulate over time. Implementation and effectiveness of best management practices and other standards will be tracked and periodically evaluated.

19. What is the impact of climate change on the planning area?

Evaluation of several monitoring questions in the light of climate variability will help identify any trends that may be occurring in the Forest.

20. What changes are occurring in the social, cultural, and economic conditions in the areas influenced by national forests in the region?

21. How has climate variability changed and how is it projected to change across the region?

22. How is climate variability and chance influencing the ecological, social, and economic conditions and contributions provided by plan areas in the region?

23. What effects do national forests in the region have on a changing climate?

Monitoring questions 20, 21, 22, and 23 will be addressed and evaluated through the Region 8 Broader-Scale Monitoring Strategy as provided in the 2012 Planning Rule.

RESEARCH NEEDS

Research and monitoring are related activities that help to meet information needs for adaptive management of national forests. Research involves rigorous study under controlled conditions, following the scientific method. Research activities include study planning, design, quality control, peer review and relatively rigid publication standards. Monitoring is generally conducted under less controlled conditions and results are often more general in contrast with research.

Research needs for management of the National Forests are to be identified during planning and periodically reviewed during monitoring and evaluation of implemented Forest Plans (36 CFR 219.28).

The Forest Service Research Branch is the largest forestry research organization in the world and a national and international leader in forest conservation. Agency research contributes to the advancement of science and the conservation of many of our Nation's most valuable natural resources, both on private lands and the National Forests. Research needs identified during planning, monitoring and evaluation are to be included in formulating overall research programs and plans for Forest Service Research to support or improve management of the National Forests.

Research needs identified during development of this Forest Plan are listed in Appendix I. Research needs identified while monitoring the implementation of the Forest Plan will be reported in Annual Monitoring and Evaluation Reports.

AMENDMENTS

The Forest Plan can be amended at any time during its existence. Such amendments are necessary to ensure that the Plan remains a viable, flexible document for managing the Forest.

Errata sheets may be issued if necessary to correct spelling or grammatical errors, which may lead to confusion in the Forest Plan. Such changes are not considered amendments.

The Forest Plan may also be amended as part of a project-level decision where a change or adjustment in the Forest Plan is appropriate for that project but is not applicable to the entire Forest. Examples of such changes might be adjustments to, or waivers of, standards, or modifications of management area boundaries.

If it is determined during project design that the best method of meeting the management area goals of the Forest Plan is in conflict with either Forest or management area standards, the Forest Supervisor may approve a project-specific amendment to the Forest Plan.

REVISION

This Forest Plan will be revised on a 10-year cycle or at least every 15 years. It may also be revised whenever the Forest Supervisor determines that conditions or demands in the area covered by the Forest Plan have changed significantly or when changes in policies, goals, or objectives would have a significant effect on the Forest-level programs. In the monitoring and evaluation process, the interdisciplinary team may recommend a revision of the Forest Plan at any time.

Future revisions are not effective until considered and approved in accordance with the requirements for the development and approval of a Forest Plan. The Forest Supervisor will review the conditions on the land covered by the Forest Plan at least every 5 years to determine whether conditions or demands of the public have changed significantly.

Forest specialists work with researchers to develop solutions to forest health risks.