Chapter 4 – Monitoring and Evaluation

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Chapter 4 – Monitoring and Evaluation

Introduction

Monitoring and evaluation are required by National Forest Management Act (NFMA) regulations to determine how well the 2006 Land and Resource Management Plan (2006 Forest Plan) is working. Monitoring and evaluation is designed to answer the following basic questions:

- Did we do what we said we were going to do in an appropriate timeframe? This question answers how well the direction in the 2006 Forest Plan is being implemented. The collected information from monitoring and evaluation efforts is compared to the goals, objectives, standards, guidelines and management area direction of the 2006 Forest Plan.
- Did the 2006 Forest Plan's direction work how we intended? This question answers whether the application of standards and guidelines is achieving the objectives, and whether objectives are achieving the goals.
- Is our understanding and science correct? This question answers whether the assumptions and predicted effects used to formulate the goals and objectives are valid.

The aim of monitoring is to have the ability to respond to changing conditions, to make appropriate changes based on new information or technology, and to test the effectiveness of the direction in the 2006 Forest Plan.

This chapter provides programmatic direction for monitoring and evaluating 2006 Forest Plan implementation.

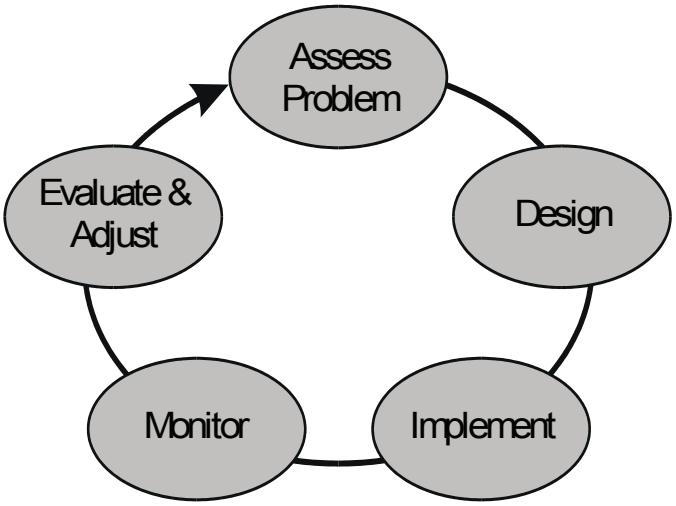
Monitoring and Evaluation Strategy

Monitoring and evaluation are separate activities. **Monitoring** is the process of collecting data and information. **Evaluation** analyzes and interprets the information and data collected from monitoring. A key requirement of a monitoring strategy is that the public be given timely, accurate information about 2006 Forest Plan implementation. This is performed through the release of an annual monitoring and evaluation report. The monitoring program must be efficient, practical and affordable, and not duplicate the collection of data already underway for other purposes.

Monitoring tasks are scaled to the 2006 Forest Plan, program or project to be monitored. Each of these entails different objectives and requirements. Monitoring is not performed on every single activity, nor does it need to meet the statistical rigor of formal research. Budgetary constraints affect the level of monitoring that can be done in a particular fiscal year. If budget levels limit the Forest's ability to perform all monitoring tasks, then those items specifically required by law would be given the highest priority. The minimum amount of legally-required monitoring is defined by NFMA.

Monitoring and evaluation keeps the 2006 Forest Plan up-to-date and responsive to changing conditions and issues. This process provides the feedback mechanism for adaptive management (see Figure 4-1). The results are used to identify when changes are needed to either the 2006 Forest Plan itself or the way it is implemented.

Monitoring and evaluation provide for a mechanism for Adaptive Forest Management.



Legal Requirements for Monitoring

The 2006 Forest Plan addresses several types of monitoring. These requirements fall into four broad categories:

Category 1	Required monitoring items [NFMA, and the 1982 36 CFR 219.12 regulations, as permitted by 36 CFR 219.14(e)(f) of the 2005 Planning Rule].
Category 2	Attainment of goals and objectives
Category 3	Implementation of standards and guidelines
Category 4	Effects of prescriptions and management practices.

Required Category 1 monitoring items (Table 4-1) are mandatory components of every Forest Plan, whereas Categories (2) through (4) monitoring items are more flexible and are tailored to address issues raised through public scoping and interdisciplinary team review. A more complete description of Category 1 through 4 monitoring items is shown in the Monitoring Matrix section of this chapter.

Table 4-1. Monitoring Regulatory Requirements

Monitoring Description	Annual Evaluation	Five-Year Evaluation
A program of monitoring and evaluation shall be conducted that includes consideration of the effects of national forest management on land, resources, and communities adjacent to or near the national forest being planned and the effects upon national forest management from activities on nearby lands managed by other federal or other government agencies or under the jurisdiction of local governments.		X
The Forest Supervisor shall 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.		X
Monitoring and evaluation requirements will provide a basis for a periodic determination of the effects of management practices.		X
At intervals established in the Forest Plan, implementation shall be evaluated on a sample basis to determine how well objectives have been met and how closely management standards and guidelines have been applied. Based upon this evaluation, an interdisciplinary team shall recommend to the Forest Supervisor such changes in management direction, revision, or amendments to the Forest Plan as are deemed necessary.		X
Monitoring requirements identified in the Forest Plan shall provide for - [1] A quantitative estimate of performance comparing outputs and services with those projected by the Forest Plan.	X	
[2]Documentation of the measured prescriptions and effects, including significant changes in productivity of the land.		X
[3]Documentation of costs associated with carrying out the planned management prescriptions as compared with costs estimated in the Forest Plan.	X	
[4] A determination of compliance with the following standards: [i] Lands are adequately restocked as specified in the Forest Plan.		X
[ii] Lands identified as not suited for timber production are examined at least every 10 years to determine if they have become suited; and that, if determined suited, such lands are returned to timber production.		As Noted
[iii] Maximum size limits for harvest areas are evaluated to determine whether such size limits should be continued.		X
[iv] Destructive insects and disease organism populations related to management activities.		X
Monitor the relationship between habitats provided on NFS lands and MIS population trends in cooperation with State fish and wildlife agencies, to the extent practicable. Population trends may be determined by a variety of methods considering best available science, including, but not limited to, data and analysis relating to habitat.[1]	X	

[1]Because methodologies to determine population numbers and/or estimate trends vary by species, conclusions that relate population trends to habitat conditions are also reached through a variety of methods. The methods include:

a. Population trends can be determined through the use of 100% population counts or can be estimated through the use of population sampling designed to estimate actual population numbers. (Although rarely used, 100% population counts can be feasible for some species, such as for populations in very restricted geographic areas.) These are the most intensive and rigorous

methodologies, usually reserved for some federally-listed species or some high risk globally-imperiled species selected as MIS.

b. Population trends can be estimated through the use of population indices. These indices are not estimates of actual population numbers, but are aimed at reflecting population trends or relative abundance for a species. Properly designed population indices are a well accepted method for assessing populations for many taxa. Examples could include state hunting/fishing information, track counts, and bird point counts. This method is commonly used in natural resource management.

c. Population trends can be estimated using population occurrence data. This approach would be appropriate for a MIS where the risk to local or broad extirpations is low to moderate (cost of making a management decision that would adversely affect the species is low to moderate) and there is high correlation and understanding for a MIS and its associated habitat(s) (high likelihood the conclusions regarding population trends would be correct).

d. When population data is not available, population trends may be inferred using species-habitat relationships information. This approach involves inferring population trends from trends in amount and condition of habitat over time, based on known relationships between species and habitat.

Monitoring Methods and Requirements

Monitoring methods categorize how precisely and reliably we measure monitoring items. The monitoring questions were developed by an Interdisciplinary (ID) Team to address 2006 Forest Plan management goals, objectives, standards, guidelines, assumptions and science. The annual monitoring plan identifies which items are measured, and how the monitoring questions are answered. The monitoring and evaluation report analyzes and summarizes the monitoring results. Table 4-3 identifies the components of the monitoring matrix; and Table 4-4 identifies the management direction monitoring items.

Monitoring is divided into two types of methods or classes: A and B, which are based on their relative precision and reliability.

Class A: These methods are well-accepted for modeling or quantitatively measuring the resource or condition. Results have a high degree of repeatability, reliability, accuracy and precision. The cost of conducting these measurements is higher than other methods.

Class B: These methods or measurement tools are based on a variety of techniques. Tools include project records, communications, on-site visual estimates or less formal measurements such as informal visitor surveys, aerial photo interpretation and other similar types of assessments. Class B methods is often qualitative in nature, but still provides valuable information on the status of resource conditions. Reliability, accuracy and precision are lower than Class A, as are costs.

Monitoring Guidelines and Components

Monitoring Framework

Many approaches to 2006 Forest Plan monitoring are currently being used throughout the Forest Service. However, each monitoring chapter must:

1. Meet the legal requirements of the planning regulations
2. Be consistent with corporate data standards and protocols
3. Be developed by an ID Team that addresses the ecological, social and economic dimensions of forest management in an integrated manner.

The relationship between these approaches is shown in Table 4-2, Monitoring Framework.

Table 4-2. Monitoring Framework

Forest Plan Monitoring (Chapter 4)	Monitoring and Evaluation Implementation Guide	Annual Monitoring Schedule	Annual Monitoring Evaluation Review
Broad and Strategic Provides the overall monitoring strategy including specific questions that need to be answered, what will be monitored, timetables for reporting, and other information.	***Focused and Technical*** Describes how, where, and when to accomplish the monitoring prescribed in the Forest Plan. It provides the specific methods, protocols and analytical procedures. The Monitoring Guide is intended to be flexible and could be modified in response to new information, updated procedures, emerging issues, and budgetary considerations without amending the Forest Plan.	***Specific, Technical, and Prescriptive*** Identifies precisely what would be monitored, where, when, and by whom for the current or upcoming year. The Annual Monitoring Schedule will be tied to the Forest Plan and Monitoring Guide.	***Specific, Technical, and Prescriptive*** The Ottawa's ID Team would review the current year's monitoring and evaluation results after the end of each calendar year. Based on these findings they will recommend to the Forest Leadership Team changes (if any) to the Forest Plan, Monitoring Guide, or Forest Service Manual or Handbook.

Monitoring Prioritization

Within any agency or institution, necessary or desirable work demands often exceed available funding. Forest Plan monitoring is no exception. Consequently, a prioritization process for monitoring items would be developed to ensure efficient use of limited time, money and personnel. The following list of potential criteria may be used to set monitoring priorities:

- Is monitoring of a particular question or resource mandated by law or regulation?
- How do monitoring items relate to local public, government and tribal resource interests?

- Is there a high degree of uncertainty associated with management assumptions (management significance)?
- Is there a high degree of disparity between existing and desired conditions?
- Are proposed management activities likely to affect resources of concern (ecological significance)?
- How do monitoring items fit into national and regional Forest Service priorities?
- What are the consequences of not knowing resource conditions?
- Will monitoring respond to a key issue?

Monitoring priorities would be established each year utilizing the above criteria, information gained during the past year, and budgets.

There would be a great amount of monitoring information collected over time. If this information is not documented, so it can be easily retrieved, shared with the public and other stakeholders, or used by agency managers to foster better decisions, it is of limited value. Information management would consist of: (1) Management of the collection and storage of data; (2) Evaluation and interpretation of data; and (3) sharing information internally and externally.

Evaluation and Interpretation of Data

Evaluation is the process of transforming data into information. It is a process that brings together values, judgment, and reason with monitoring information, to answer selected questions. Successful adaptive management depends on this information to move the Ottawa toward the desired conditions. The Ottawa's ID Team will review the current year's monitoring and evaluation results after the end of each calendar year and make recommendations for changes to the Forest Plan, Monitoring Guide, or Forest Service Manuals and Handbooks.

Annual Monitoring and Evaluation Report

The annual monitoring and evaluation report provides an opportunity to track progress toward the implementation of the 2006 Forest Plan decisions and the effectiveness of specific management practices. The focus of the evaluation is more internal to the Forest Service in providing immediate guidance to ongoing management. This evaluation is tied specifically to the questions identified for each monitoring element. The focus of this evaluation is on the individual Forest Plan monitoring elements specified in the following monitoring matrix section.

Public Involvement

The Forest Service mission "Caring for the Land and Serving People" will not be realized without public trust in our decision making process. Even though agency decisions will not consistently please everyone, using an open process for making decisions should foster public understanding of the rationale for individual decisions. The same principle applies to monitoring. Moreover, since our approach incorporates an adaptive strategy, frequent public feedback is necessary to facilitate monitoring activity prioritization, protocols, evaluation, and

ultimately better informed decisions. Subsequently a strategy for involving the public and other agencies in Forest monitoring planning, execution, and evaluation would be attempted each year. Partnerships with interest groups, volunteer groups, other federal, state and local agencies, Native American tribes and universities would be part of that strategy. Different avenues of public involvement such as news releases, the internet, monitoring information trips for public, brochures, and public reports may be used.

Monitoring Matrix

Required and management direction monitoring are outlined in the matrix. The more prescriptive standards and guides will be addressed in the Monitoring and Evaluation Guide. The focal point for each monitoring item is the monitoring question. Each monitoring question is derived from one or more monitoring drivers (legal requirements, desired conditions, objectives, etc.). Table 4-3 defines the components of the Monitoring Matrix. Not all the monitoring drivers, such as regulations, agency guidance and Forest Plan management direction is required to be monitored each year. Drivers that best answer the monitoring question for each resource area will be identified during the annual monitoring schedule process.

Table 4-3. Components of the Monitoring Matrix

Component	Definition
Resource Area	A quantitative or qualitative parameter that can be assessed.
Monitoring Question	Specific monitoring question(s) developed to ensure that monitoring and evaluation address information essential to measuring the Forest Plan. These questions relate to the different purposes and rationales for monitoring. There may be more than one monitoring question per resource area.
Monitoring Driver	Monitoring drivers identify reasons why we are monitoring a particular item. The following is a list of these drivers: (1) Legal and regulatory requirements and Forest Service Manual direction; (2) goals and objectives, which are assigned numerical and alphabetical characters as depicted in the Forest Plan; and (3) Validation of assumptions and predictions.
Measurement Frequency	Describes how often monitoring information is collected.
Evaluation and Reporting Frequency	Describes how often monitoring information is evaluated and reported.

Precision and Reliability Class	Two classes of precision and reliability are appropriate at the Forest Plan scale: **Class A:** Methods appropriate for modeling or quantitative measurement. Results have a high degree of repeatability, reliability, accuracy and precision. **Class B**: Methods based on project records, personal communications, ocular estimates, pace transects, informal visitor surveys and similar types of assessments. The degree of repeatability, reliability, accuracy and precision are not as high as Class A methods, but they still provide valuable information.

Category 1 (Required), Category 2 (Desired Conditions and Objectives) and Category 4 (Effects of Prescriptions, Management Practices) are outlined in the following monitoring matrix (Tables 4-4 and 4-5). The more prescriptive Standards and Guidelines (Category 3) will be addressed in the Monitoring Guide.

Table 4-4. Monitoring Matrix

Resource Area	Monitoring Question(s)	Drivers	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
All	How close are actual outputs and services to those outputs and services projected in the 2006 Forest Plan?	NFMA. A quantitative estimate of performance comparing outputs and services with those projected by the Forest Plan.	Annual	Annual	A
All	How close are actual costs to projected costs?	NFMA. Documentation of costs associated with carrying out the planned management prescriptions as compared with costs estimated in the Forest Plan.	5 years	5 years	A

Resource Area	Monitoring Question(s)	Drivers	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
Social and Economic Vitality	To what extent do output levels, location of timber harvest, and the mix of sawtimber and pulpwood compare to those levels projected?	NFMA. A quantitative estimate of performance comparing outputs and services with those projected by the Forest Plan. A program of monitoring and evaluation shall be conducted that includes consideration of the effects of national forest management on land, resources, and communities adjacent to or near the national forest being planned and the effects upon national forest management from activities on nearby lands managed by other federal or other government agencies or under the jurisdiction of local governments.	3 to 5 Years	3 to 5 Years	A/B
Insects and Disease	Are insect and disease population levels compatible with objectives for restoring or maintaining healthy forest conditions?	NFMA and Goal 37. Destructive insects and disease organisms do not increase to potentially damaging levels following management activities.	Annual	Annual	A/B

Resource Area	Monitoring Question(s)	Drivers	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
Recreation: Off-Highway Vehicles	What are the effects of OHVs on the physical and social environment? How effective are forest management practices in managing OHV use? To what extent are road and trail closures effective in prohibiting unauthorized motor vehicle use?	NFMA and Goals 1, Goal 3, and Objectives 9b and 9c. Off-road vehicle use shall be planned and implemented to protect land and other resources, promote public safety, and minimize conflicts with other uses of the National Forest System lands. Forest planning shall evaluate the potential effects of vehicle use off roads and, on the basis of the requirements of 36 CFR 212, classify areas and trails of National Forest System lands as to whether or not off-road vehicle use may be permitted.	Annual	1 to 5 years	A/B
Timber	Are harvested lands adequately restocked after five years?	NFMA. Lands are adequately restocked as specified in the Forest Plan.	Annual	Annual	A

Resource Area	Monitoring Question(s)	Drivers	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
Timber	To what extent are timber management activities occurring on lands suited for timber production? To what extent have conditions or information changed the classification of lands "not suited" for timber production to "suitable" for timber production?	NFMA. Lands identified as not suited for timber production are examined at least every 10 years to determine if the have become suited; and that, if determined suited, such lands are returned to timber production.	10 years	10 years	A
Timber	To what extent and under what circumstances are clearcuts, and other openings created by even-aged management, exceeding 40 acres?	NFMA. Maximum size limits for harvest areas are evaluated to determine whether such size limits should be continued.	Years 5 and 10	Years 5 and 10	A/B
Soils	Are the effects of Forest management, including prescriptions, resulting in significant changes to productivity of the land?	NFMA, Goal 20 and Objective 20a. Documentation of the measured prescriptions and effects, including significant changes in productivity of the land.	1 to 5 years	1 to 5 years	A/B

Resource Area	Monitoring Question(s)	Drivers	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
Wildlife/Botany: Management Indicator Species	To what extent are forest management activities providing habitat for Management Indicator Species.[(1)(2)]	NFMA, Goal 1 and Objectives 1b-1e; Goal 2 and Objectives 2a-2d, 2f; Goal 3 and Objectives 3a, Goal 20 and Objective 20e; Goal 23, Goal 27 and Objective 27a; Goal 31 and Objective 31a; Objective 32a and Goal 34.	Annual[(3)(4)]	1 to 5 years	A/B

[(1)]Because methodologies to determine population numbers and/or estimate trends vary by species, conclusions that relate population trends to habitat conditions are also reached through a variety of methods. The methods include:

a. Population trends can be determined through the use of 100% population counts or can be estimated through the use of population sampling designed to estimate actual population numbers. Although rarely used, 100% population counts can be feasible for some species, such as for populations in very restricted geographic areas. These are the most intensive and rigorous methodologies, usually reserved for some federally-listed species or some high risk globally-imperiled species selected as MIS.

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d. When population data is not available, population trends may be inferred using species-habitat relationships information. This approach involves inferring population trends from trends in amount and condition of habitat over time, based on known relationships between species and habitat.

[(2)]Site-specific monitoring or surveying of a proposed project or activity area is not required. At the project-level, habitat analysis will be conducted, as appropriate. These analyses will determine the effects, including cumulative effects, for each alternative on each MIS selected for the project. The effects to MIS habitat for the project are put into perspective by discussing Forestwide MIS conditions and trends.

[(3)]Unless monitoring protocol for the species indicates otherwise.

[(4)]To the degree practical given unforeseen circumstances.

Resource Area	Monitoring Question(s)	Drivers	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
Public Involvement and Coordination	To what extent does the Forest emphasize agency, tribal, and public involvement and intergovernmental coordination with federal, state, county governments and agencies?	Goal 4, Goal 5, and Goal 6	5 years	5 years	A/B
Non-native Invasive Species	To what extent is Forest management contributing or responding to non-native invasive species?	Goal 1, Objective 3f, Goal 8 and Objectives 8a-8d; Goal 37 and Objective 37c.	1 to 5 years	1 to 5 years	B
Recreation	What amount of road routes and recreation trails are designated open for OHV riding and provide connections to other public trails?	Goal 9 and Objective 9c	1 to 5 years	1 to 5 years	A/B
Recreation	To what extent is the Forest providing a range of motorized and non-motorized recreation opportunities that incorporate diverse public interests yet achieve applicable management area objectives and desired conditions?	Goal 9, Objectives 9a-9b and Goal 10	1 to 5 years	1 to 5 years	A/B
Recreation	To what extent are Forest management activities in semi-primitive non-motorized management areas in alignment with the Recreation Opportunity Spectrum Objectives?	Goal 9 and Objective 9a	1 to 5 years	1 to 5 years	A/B

Resource Area	Monitoring Question(s)	Drivers	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
Heritage	To what extent is Forest management contributing to the preservation, evaluation of and education for heritage resources?	Goal 5 and Objectives 5a-5c; Goal 12 and Objectives 12a, 12b-12b1 and 12c-12c2	5 years	5 years	A
Tribal Rights and Interests	Monitor implementation of the 2006 Forest Plan with respect to tribal treaty rights applicable on the Ottawa with respect to the tribal MOU.	Goal 5, and Objectives 5a-5c,	Annual	Annual	B
Wilderness	To what extent is wilderness management contributing to improvement or preservation of wilderness characters and values?	Goal 10, Objectives 10a-10c	1 to 5 years	1 to 5 years	A/B
Vegetation: Spatial Patterns	To what extent are Forest management activities restoring vegetation composition and spatial landscape patterns and moving toward desired conditions at the Forest, management area and other appropriate landscape scales?	Goal 1	5 years	5 years	A/B
Vegetation: Old Growth	To what extent are existing and potential old growth forest conditions being classified consistent with management area objectives?	Goal 1, Objective 1e	5 years	5 years	A/B

Resource Area	Monitoring Question(s)	Drivers	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
Vegetation: Permanent Upland Openings	To what extent are permanent upland openings being created and maintained to move towards the desired condition at the Forest, management area and landscape scale?	Goal 1, Objective 1f	5 years	5 years	A/B
Vegetation: Hardwood Management	To what extent are northern hardwoods being managed to work toward the desired mix of even-aged and uneven-aged stands?	Goal 15	5 years	5 years	A/B
Vegetation: Aspen/Paper Birch Management	To what extent are aspen forest type acres being maintained through regeneration activities to meet Forestwide and management area objectives?	Goal 16, Objective 16a	5 years	5 years	A/B
Vegetation: Long-Lived Conifers	To what extent are long-lived conifer forest types being increased or maintained through regeneration activities to meet Forestwide and management area objectives?	Goal 17	5 years	5 years	A/B
Vegetation: Short-Lived Conifers	To what extent are short-lived conifer forest types being maintained through regeneration activities to meet Forestwide and management area objectives?	Goal 17	5 years	5 years	A/B

Resource Area	Monitoring Question(s)	Drivers	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
Vegetation: Natural and Artificial Reforestation	To what extent is natural regeneration favored over artificial reforestation to meet Forestwide and management area objectives?	Goal 18	5 years	5 years	A/B
Vegetation: Ecological processes	To what extent is Forest management maintaining or restoring conditions that result from or emulate natural ecological patterns and processes such as fire, wind, flooding, and insect and disease outbreaks?	Goal 1, Objectives 1a-1e; Goal 2, Objectives 2a-2d; Goals 13, 14, 15, 16, 17, 18, 20, 26, Objectives 39c and 39e	1 to 5 years	1 to 5 years	B
Vegetation: Ecological processes	To what extent is Forest management utilizing the Ecological Classification System and its components to implement ecosystem based management?	Goal 1, Objectives 1a-1e; Goal 2, Objective 2a-2e; Goals 13, 14, 15, 16, 17, 18, 20 and 26	1 to 5 years	1 to 5 years	B
Soils	To what extent is Forest management affecting soil quality?	Goal 1; Goal 20, Objectives 20a-20d; Goals 21, 22 and 23	1 to 5 years	1 to 5 years	B
Watershed Health and Riparian	To what extent is Forest management affecting riparian and wetland ecosystems?	Goal 3 and Objectives 3a-3f; Goal 20 and Objectives 20b-20f; Goals 21, 22, 23; Goal 24 and Objectives 24a-24c	1 to 5 years	1 to 5 years	B

Resource Area	Monitoring Question(s)	Drivers	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
Wildlife and Fish	To what extent has management maintained or restored the diversity and abundance of native aquatic flora and fauna in streams and lakes in a manner consistent with the capability of the water body?	Objectives 2b and 2c; Goal 3 and Objectives 3a-3e; Goal 8 and Objectives 8a-8d; Goal 20 and Objectives 20a-20f; Goals 21, 22, 23; Goal 24 and Objectives 24a-24c, Goals 26, 27, 30, 32, Objective 33a, Goal 34, and Objective 35a	1 to 5 years	1 to 5 years	A/B
Wildlife	To what extent are the key terrestrial and aquatic habitat components (e.g., soft mast, hard mast, snags, down woody material, low dense conifer regeneration) being provided?	Goal 1 and Objectives 1a-1f, Goal 2 and Objectives 2a-2e, Objectives 3b and 3d; Objectives 15c and 15e, Objectives 16a and 16b, Goal 17, Objectives 20b and 20f, Goals 21 and 22, Objectives 26a and 26f, Objective 32a and Objective 33a	1 to 5 years	1 to 5 years	A/B

Resource Area	Monitoring Question(s)	Drivers	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
Wildlife, Fish and Botany: Native and Desired Non-Native Species	To what extent is Forest management providing ecological conditions to maintain viable populations of native and desired non-native species?	Goal 1 and Objectives 1a-1f; Goal 2 and Objectives 2a-2f; Goal 3 and Objectives 3a-3f; Goal 8 and Objectives 8a-8d; Objectives 15a, 15c, 15e; Objectives 16a-16b; Goal 17, Goal 20 and Objectives 20a-20c, 20e-20f; Goal 22; Goal 22; Goal 26 and Objectives 26a, 26c, 26f; Objective 27a, Goal 35 and Objectives 35a	1 to 5 years	1 to 5 years	B
Wildlife/Botany: Species of Viability Concern	To what extent is Forest management contributing or responding to the conservation of species of viability concern (such as Regional Foresters Sensitive Species) and moving toward desired habitat conditions for these species?	Goal 26 and Objective 26b; Goal 30 and Objectives 30a-30b; Goal 31 and Objectives 31a-31b; Objective 34a; Goal 35 and Objective 35b-35c	1 to 5 years	1 to 5 years	A/B
Wildlife: Threatened and Endangered Species	To what extent is forest management contributing to the conservation of threatened and endangered species and moving toward desired habitat conditions and populations trends for these species?	Goal 26 and Objective 26b; Goal 28 and Objectives 28a-28b; Goal 29 and Objective 29a; Goal 31 and Objectives 31a-31b	1 to 5 years	1 to 5 years	A/B

Resource Area	Monitoring Question(s)	Drivers	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
Wildlife: Threatened and Endangered Species	To what extent is Forest management affecting the density of open roads within the Remote Habitat Area, and moving toward the Forest density objective of < 1.0 miles/square mile?	Objectives 31a and 31b	1 to 5 years	1 to 5 years	A/B
Wildlife: Threatened and Endangered Species	To what extent is Forest management contributing to the development and maintenance of foraging and denning habitat, and connectivity of habitats for Canada lynx?	Objectives 1b-1e, Objectives 2a-2c, Objectives 16a-16b, Goal 17, Objectives 20b-20c; Objectives 26a-26c, Objective 27a, Objectives 28a-28b, Goal 29, Objectives 31a-31b and Objectives 39c-39d	1 to 5 years	1 to 5 years	A/B
Wildlife: Off-highway Vehicles	To what extent are OHVs producing impacts to wildlife or wildlife habitats?	Objectives 8a-8c, Goals 9 and 26; Objective 26b, Goals 30 and 31	1 to 5 years	1 to 5 years	A/B
Minerals	To what extent is the Forest providing minerals and mineral materials to help support economic growth?	Goal 36	1 to 5 years	1 to 5 years	A
Land Adjustment	To what extent has land ownership adjustment facilitated forest management activities?	Goal 40	2 years	2 to 5 years	A/B
Fire	To what extent is forest management meeting hazardous fuels objectives?	Goal 39, Objectives 39a-39b and 39d	1 to 5 years	1 to 5 years	A/B

Resource Area	Monitoring Question(s)	Drivers	Measurement Frequency	Evaluation/ Reporting Frequency	Precision and Reliability Class
Fire	To what extent is wildland fire (natural and prescribed) used to maintain or mimic natural processes, and/or restore natural processes and functions to ecosystems?	Goal 8, Goal 10 and Objectives 10a-10b, Goal 26, Goal 28 and Objectives 39c and 39e	1 to 5 years	1 to 5 years	A/B
Fire	How have fire suppression tactics been implemented on the Forest relative to the threat posed to human life, property, or threatened resources?	Goal 39	1 to 5 years	1 to 5 years	A/B
Transportation	To what extent are the unneeded roads being decommissioned? To what extent are road closures on decommissioned roads effective in prohibiting unauthorized motor vehicle use?	Goal 41	1 to 5 years	1 to 5 years	B