

CHAPTER V

Monitoring and Evaluation Requirements



CHAPTER V

IMPLEMENTING, MONITORING, EVALUATING, AMENDING, AND REVISING

This chapter briefly describes how this Plan will be implemented, how it's implementation and effects will be monitored and evaluated, and how it may be changed in response to effects, changing conditions, or new information.

FOREST PLAN IMPLEMENTATION

Three key processes will be used to implement the Forest Plan: interagency coordination, adaptive management; and watershed analysis. Interagency coordination will ensure coordinated and consistent implementation of management strategies, particularly in the areas of late successional and old growth habitat and anadromous fisheries. Adaptive management is a continuing process of action-based planning, monitoring, researching, evaluating, and adjusting with the objective of improving the implementation and achieving the goals of the standards and guidelines and land allocations of this alternative (USDA/USDI 1994) Watershed analysis will be the process used to implement ecosystem management. Watershed analysis will focus on collecting and compiling information within the watershed that is essential for making sound management decisions. It will be an analytical process, not a decision making process. It will serve as the basis for developing project specific proposals, and determining monitoring and restoration needs for a watershed. The information from the watershed analysis will contribute to decision making at all levels (USDA/USDI 1994)

The Forest Plan identifies land allocations, Forest-wide standards and guides, and general management prescriptions, all of which are expected to achieve Forest goals and objectives. However, additional planning, analysis, and environmental assessments must be prepared to implement site specific projects. *Project proposals are generally developed following watershed or landscape level analysis or program planning (e.g. fire management plans, transportation plans, etc).* These types of analysis are necessary to take a much more detailed look at the current conditions of ecosystem structure, composition, and function within an area to determine various projects which may improve unsatisfactory conditions, which may have unacceptable effects, or which contribute to attaining Forest goals and objectives.

The additional planning or analysis may identify several projects for an area, and it is the Line Officer who selects which projects to move forward through the NEPA process. Occasionally, a project can only be reasonably accomplished in one certain way. However, there are usually alternative methods to accomplishing a project using different equipment or material; varying the location, timing or intensity; and mitigating potentially adverse effects by different means--avoid, minimize, rectify, reduce or eliminate, and/or compensate. Analysis of project level decisions are documented in project files, Environmental Assessments, and Environmental Impact Statements in accordance with CEQ Regulations, 40 CFR 1500-1508 and the Forest Service Environmental Policy and Procedures Handbook, FSH 1909.15.

Each project level decision document (Decision Memo, Decision Notice, or Record of Decision) will include a finding of compliance with Forest Plan direction. If a project is not consistent with Forest Plan direction, there are three options: 1) modify the proposal for compliance; 2) reject the proposal; 3) amend the Forest Plan to permit the proposal. An amendment could be warranted if, following watershed or landscape analysis and project level planning, the Forest Supervisor determines that sufficient new information, conditions, or objectives in the area have changed. In addition, changes in the Resources Planning Act policies, goals, or objectives could affect Forest programs, triggering an amendment

MONITORING AND EVALUATION

Implementation of the Forest Plan will be appraised through a program of monitoring and evaluation. The purposes of this program are to:

- Inform and assess our progress toward achieving Plan goals and objectives;
- Determine the costs and effects of implementation;
- Identify the need for Plan amendments or revisions.

Monitoring and evaluation will determine the success of 1) achieving Plan goals and objectives through program and project development, 2) predicting the effects of standards, guidelines, management prescriptions, and land allocations; and 3) predicting actual costs and personnel requirements

In addition, monitoring and evaluation will determine if management practices of adjacent or intermingled non-Forest lands are affecting the Forest Plan goals and objectives, or how Plan implementation affects the stated objectives of other Agencies.

There are three types of monitoring. Implementation monitoring is conducted to determine if plans programs, projects, and activities are implemented in compliance with Forest Plan objectives and direction (S&Gs and management prescriptions) Implementation monitoring is usually carried out during project design, planning (the finding of consistency in the decision document), and administration; through functional assistance trips and general management reviews; through regular reporting of accomplishments; and during budget development and allocation. Effectiveness monitoring is conducted to determine if management practices are effective in meeting the intent of the standards and guidelines, and are there more efficient methods of achieving the intent of the standards and guidelines. Finally, validation monitoring is used to determine if the Forest Plan goals and objectives are still appropriate.

When do we really need to monitor and why?

- During project implementation
- When there are significant issues to be resolved
- When critical mitigation measures are necessary
- Implementing new management techniques
- Actions with high risks
- To validate key assumptions

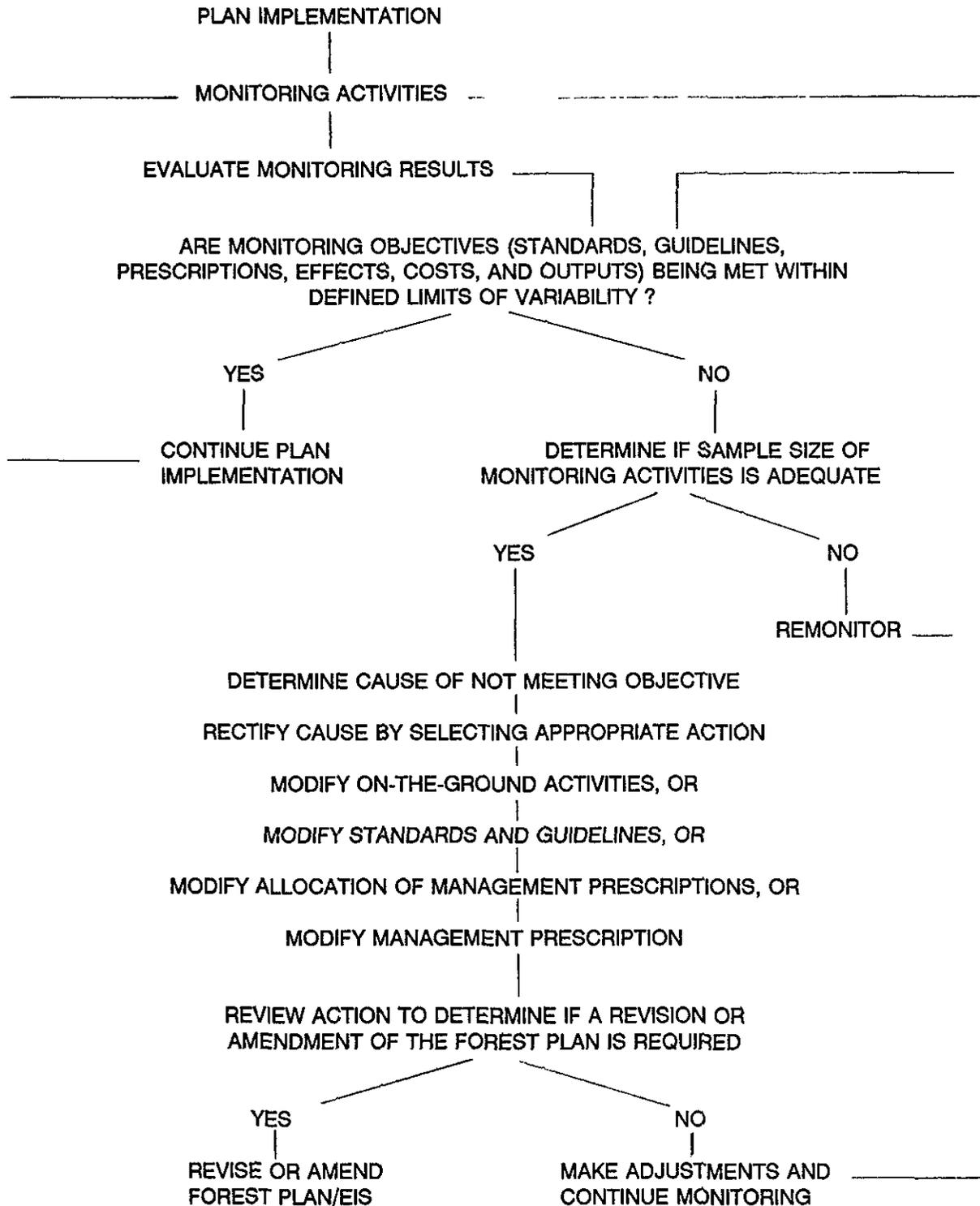
The monitoring and evaluation accomplishments, as well as outputs, for each fiscal year will be documented in a monitoring and evaluation report which will be completed within 60 days after the end of each fiscal year.

The principal information sources for monitoring the Plan are:

1. Management Reviews, including General Management Reviews, Program Reviews, and Activity Reviews
2. Inventories and Monitoring Programs, such as monitoring for water quality, heritage resources, threatened and endangered species, and range trend inventories.
3. Management Attainment Reports, which are tri-yearly reports concerning progress toward stated annual objectives.
4. Environmental Analysis Process, where project level analysis of resource data identify data base updates needed, and the effectiveness of direction in meeting Forest goals.

Figure 5-1 displays the overall monitoring and evaluation process. For each monitoring activity, the objective, method, frequency, precision, and responsibility is specified.

MONITORING AND EVALUATION DECISION TREE



PRECISION

This will be measured using an incremental scale as shown in Table 5-1 and will be an estimate of the exactness or accuracy of the measurement technique and the expected probability that the information acquired through monitoring reflects actual conditions. Some components have a high level of precision and reliability such as permitted Animal Unit Months (AUMs), and timber volume sold (MMBF). Other components will have lower levels of precision and reliability because of the monitoring techniques available or feasible such as forage condition and trend.

Table 5-1
PRECISION AND RELIABILITY LIMITS FOR MONITORING

Level of Precision	Accuracy Limits
High	Allows 10% variation of the standard
Moderate	Allows 33% variation of the standard
Low	Allows 50% variation of the standard
N/A	Not applicable or measurable by statistical methods

EVALUATION

Evaluation of the results of the site specific monitoring program will be documented in the annual monitoring and evaluation report. The results of the monitoring program will be analyzed and evaluated by an Interdisciplinary Team.

Based on the evaluation, any need for further action or adjustment will be recommended to the Forest Supervisor. This may include:

- No action needed. Monitoring indicates goals, objectives and standards are achieved.
- Refer recommended action to the appropriate line officer for improvement of application of management prescriptions.
- Modify the management area prescription as a Forest Plan amendment.
- Modify the allocation of a prescription as a Forest Plan amendment.
- Revise the projected schedule of outputs or revise direction in the Forest Plan.
- Initiate revision of the Forest Plan.

Plan modification and/or revisions will be made in accordance with the NEPA process and NFMA regulations.

Documentation of the Forest Supervisor's decisions resulting from monitoring and evaluation will be maintained for future use in amending or revising the Forest Plan. An annual evaluation report of these decisions will be prepared and submitted to the Regional Forester

The necessary costs of monitoring are included within the total budget for implementing the Forest Plan. In some cases, monitoring will be, or is already being accomplished as a part of other activities and may not require additional funding.

MONITORING PLAN

AIR QUALITY

Monitoring Objective: To ensure that standards and guidelines for maintenance of air quality are implemented as prescribed.

Method: Review of at least one project plan per Ranger District to determine if applicable standards and guidelines have been incorporated into the design of the project.
Standard: Applicable standards and guidelines incorporated into project plans.
Precision: High
Frequency: Annually
Responsibility: Soil & Watershed Staff

Monitoring Objective: Assure that all prescribed fires are conducted in compliance with air quality regulations.

Method: Visual
Standard: Local Air Resource Board regulations, R-5 Smoke Management Plan, Project Burn Plans.
Precision: Low
Frequency: Each Project
Responsibility: Fire Management

Monitoring Objective: Determine trends in Air Quality Resource Values (AQRVs) within Class I Wilderness Areas.

Method: Sample trend analysis of indicator species and visibility measurements
Standard: < 10% change from baseline
Precision: Moderate
Frequency: 1-5 years
Responsibility: Recreation

DIVERSITY

Monitoring Objective: **To determine if the forest ecosystem is functioning as a productive and sustainable ecological unit.

Method: Evaluate results of the most recent inventory data including ecological unit inventories.
Standard: Appropriate size, location, spatial distribution, species composition, and development of late successional and old growth forests. Retention of snags and coarse woody debris. Abundance and diversity of species associated with late successional forest communities. Species presence. Percent of land area affected by exotic species. Structure, composition, ecological processes, and ecosystem functions of late successional and old growth forests. Air quality meeting standards.
Precision: Moderate
Frequency: Every 5-10 years
Responsibility: Interdisciplinary

Monitoring Objective: **To determine if the use of prescribed fire or fire suppression is maintaining the natural processes of the forest ecosystem.

Method: Evaluate results of the most recent inventory data including ecological unit inventories.
Standard: Appropriate size, location, spatial distribution, species composition, and development of late successional and old growth forests. Retention of snags and coarse woody debris. Abundance and diversity of species associated with late successional forest communities. Species presence. Percent of land area affected by exotic species. Structure, composition, ecological processes, and ecosystem functions of late successional and old growth forests. Air quality meeting standards.
Precision: Moderate
Frequency: Every 5-10 years
Responsibility: Interdisciplinary

Monitoring Objective: **To determine if a functional interacting, late successional ecosystem maintained where adequate and restored where inadequate.

Method: Evaluate results of the most recent inventory data including ecological unit inventories.
Standard: Appropriate size, location, spatial distribution, species composition, and development of late successional and old growth forests. Retention of snags and coarse woody debris. Abundance and diversity of species associated with late successional forest communities. Species presence. Percent of land area affected by exotic species. Structure, composition, ecological processes, and ecosystem functions of late successional and old growth forests.
Precision: Moderate
Frequency: During Late Successional Reserve assessments and updates
Responsibility: Interdisciplinary

Monitoring Objective: **To determine if silvicultural treatments benefit the creation and maintenance of late successional conditions.

Method: Evaluate results of silvicultural treatments designed to benefit the creation and maintenance of late successional forests within Late Successional Reserves.
Standard: Appropriate size, location, spatial distribution, species composition, and development of late successional and old growth forests. Retention of snags and coarse woody debris. Abundance and diversity of species associated with late successional forest communities. Species presence. Percent of land area affected by exotic species. Structure, composition, ecological processes, and ecosystem functions of late successional and old growth forests. Air quality meeting standards.
Precision: Moderate
Frequency: First and seventh year following project completion
Responsibility: Interdisciplinary

ECONOMICS

Monitoring Objective: **To determine if predictable levels of timber and nontimber resources available are being produced.

Method Evaluate levels of annual Forest outputs for timber harvest levels, special forest products, livestock grazing, mineral extraction, recreation, and scenic and air quality
Standard: < 20% variation between actual and planned outputs
Precision: Moderate
Frequency: At five year intervals
Responsibility: Planning and Budget

Monitoring Objective: **To determine if local communities and economies are experiencing positive or negative changes that may be associated with National Forest management.

Method. Participate, where appropriate, in Provincial or Regional evaluations of effects.
Standard: N/A
Precision: N/A
Frequency: N/A
Responsibility: Planning and Rural Development

Monitoring Objective: To validate predicted versus actual unit costs

Method: Analysis of actual expenditures and accomplishment in comparison to those planned.
Standard: < 20% variation between actual and planned unit costs
Precision: High
Frequency: Annually
Responsibility: Planning and Budget

Monitoring Objective: To validate total planned costs for Plan implementation.

Method. Analysis and comparison of annual budget to Forest Plan budget
Standard: < 35% variation between actual and predicted cost
Precision: High
Frequency: Annually
Responsibility: Planning and Budget

FACILITIES

Monitoring Objective: To determine the adequacy of road design and management in relation to user safety.

Method. Analysis of Forest accident records
Standard:
Precision: High
Frequency: Annually
Responsibility: Engineering

Monitoring Objective. To determine the effectiveness of road design and maintenance in promoting stability.

Method: Field Review
Standard: Acceptable road maintenance costs
Precision: Moderate
Frequency: Annually
Responsibility: Engineering

Monitoring Objective: To evaluate the appropriateness of maintenance levels to resource management needs.

Method: Field review of system roads
Standard: Prescribed road management objectives
Precision: Moderate
Frequency: Annually
Responsibility: Engineering

Monitoring Objective. To determine actual road use in relation to capacity

Method: Field review/traffic counters as needed
Standard:
Precision: Moderate
Frequency: Annually
Responsibility: Engineering

Monitoring Objective: To determine facility maintenance and replacement needs, and energy consumption.

Method: Field and office review of buildings, bridges, culverts, and dam functioning.
Standard: Adequate facilities and energy consumption for effective Forest management
Precision: High
Frequency: Every two years
Responsibility: Engineering

FIRE AND FUELS MANAGEMENT

Monitoring Objective: **To determine if the terrestrial and aquatic resources are being managed according to the standards and guidelines.

Method: Interdisciplinary review of one project per year.
Standard: Prescribed burning projects implemented consistent with land allocation and Forest-wide standards and guidelines, Regional Ecosystem Office review requirements, Late Successional Reserve assessments, and project specific requirements.
Precision: High
Frequency: Annually
Responsibility: Interdisciplinary

Monitoring Objective: **To assure that the use of prescribed fire and fuel treatment programs accomplish Forest Plan goals and objectives

Method: Field review
Standard: Accomplishment of Forest Plan goals and objectives
Precision: Moderate
Frequency: Annually
Responsibility: Fire Management

Monitoring Objective: To evaluate the effectiveness of Forest Plan standards and guidelines in affording appropriate protection to other resources from adverse effects resulting from the use of prescribed fire.

Method: Field review of at least one prescribed burn per Ranger District per year
Standard: Compliance with Forest Plan standards and guidelines
Precision: Moderate
Frequency: Annually
Responsibility: Fire Management

Monitoring Objective: To provide a comparison of actual and predicted acreage loss from wildfire.

Method: Evaluation of Fire Reports
Standard: < 20% deviation from projected losses (averaged over 10 years)
Precision: High
Frequency: Annually
Responsibility: Fire Management

HERITAGE RESOURCES

Monitoring Objective To assure that heritage resource values are given appropriate consideration in project planning and design.

Method: General management reviews, activity reviews, and routine review of all project plans
Standard: All activities must meet mandated laws, regulations, and policy.
Precision: High
Frequency: A minimum of one activity review per Ranger District per year.
Responsibility: Recreation & Heritage Resources

Monitoring Objective: To determine the extent of effects of management activities on heritage resources.

Method: Pre and post project field review and evaluation of heritage resource sites within current project areas.
Standard: Pre-project condition
Precision: High
Frequency: One site review and evaluation per Ranger District per year
Responsibility: Recreation and Heritage Resources

Monitoring Objective: To determine the extent and effects of vandalism on heritage resources

Method: Site evaluation upon receipt of reported vandalism.

Standard: Pre-affected condition

Precision: High

Frequency: In response to each reported occurrence

Responsibility: Recreation & Heritage Resources

Monitoring Objective: To determine the extent of natural degradation of heritage resources.

Method: Site evaluation upon receipt of reported degradation.

Standard: Pre-affected condition

Precision: High

Frequency: In response to each reported occurrence

Responsibility: Recreation and Heritage Resources

MINERALS

Monitoring Objective: To assure that minerals operations meet standards and guidelines for protection and management of surface resources.

Method: Review and recommendation for requirements for plans of operation. Field reviews during minerals operations.

Standard: Compliance with Forest Plan standards and guidelines

Precision: High

Frequency: In response to each plan of operations

Responsibility: Minerals

RANGE

Monitoring Objective: To assure compliance with forage utilization standards specified in Forest Plan.

Method: Forage utilization measurement on key areas on each grazed allotment at the end of the use season.

Standard: Forest Plan standards and guidelines

Precision: High

Frequency: Annually

Responsibility: Range Management

Monitoring Objective: To assure that permitted livestock use is managed consistent with Forest Plan direction.

Method: Field inspection of all allotments with prior year non-compliance problems and on 1/3 of remaining allotments

Standard: Forest-wide standards and guidelines/Management Area direction

Precision: High

Frequency: Annually

Responsibility: Range Management

Monitoring Objective: To determine current condition and trend of grazed rangeland ecosystems.

Method: Condition and trend studies on 10% of allotments on a rotating basis

Standard: Rangeland condition in a good or better condition, or in an improving condition.

Precision: Moderate

Frequency: Annually

Responsibility: Range Management

Monitoring Objective: To assure that permitted livestock use is managed consistent with attainment of aquatic conservation strategy objectives

Method: Condition and trend studies of riparian areas within range allotments.

Standard: Riparian condition goals

Precision: High

Frequency: Annually for condition; 5-10 year interval for trend

Responsibility: District Rangers

Monitoring Objective: To determine the effectiveness of allotment management in reducing conflict with other resource values and uses

Method: Interdisciplinary review of one randomly selected allotment per year.

Standard: Coordinated livestock management with only occasional conflict with other resources

Precision: Moderate

Frequency: Annually

Responsibility: Range Management

Monitoring Objective: To evaluate success of structural and non-structural rangeland improvements.

Method: Field review after the first and third years following project completion.

Standard: Accomplishment of objectives as stated in project plan.

Precision: High

Frequency: First and third years after project completion

Responsibility: Range Management

RECREATION

Monitoring Objective: To monitor capacity/demand relationships and facility/replacement status.

Method: Evaluation of annual use in relation to capacity and field review and evaluation of facility condition.

Standard: Actual use at <80% of designed capacity and facilities maintained at the standard service level.

Precision: Moderate

Frequency: Annually

Responsibility: Recreation

Monitoring Objective: To determine changes in acreage by Recreation Opportunity Spectrum (ROS) category.

Method: Evaluation of the effects of all projects on accomplishment of ROS objectives for the project area.

Standard: < 10% deviation from Forest Plan ROS acreage objectives

Precision: High

Frequency: Each project with an annual summary

Responsibility: Recreation

RIPARIAN AND AQUATIC ECOSYSTEMS

Monitoring Objective: **To determine if the aquatic and riparian resources are being managed according to the standards and guidelines.

Method: Interdisciplinary review of four projects per year.

Standard: Projects implemented consistent with riparian reserve and Forest-wide standards and guidelines, and Regional Ecosystem Office review requirements. To determine if watershed analysis has been completed where required.

Precision: High

Frequency: Annually

Responsibility: Interdisciplinary

Monitoring Objective: **To determine if the aquatic, riparian, economic, and social resources are being managed according to the standards and guidelines for watershed analysis.

Method: Interdisciplinary review of one watershed analysis or watershed analysis updates per year.

Standard: Involvement of multiple agencies, the public, and others in conducting and monitoring watershed analysis. Information is shared between multiple agencies, the public, and others. Clear expectations and responsibilities are identified. Active partnerships are sought and promoted.

Precision: High

Frequency: Annually

Responsibility: Interdisciplinary

THREATENED, ENDANGERED AND SENSITIVE (TES) PLANTS

Monitoring Objective: To evaluate the effectiveness of Forest Plan standards and guidelines in providing for the maintenance and improvement of TES plant populations on the Forest.

Method: Sample of the occurrence, density, and reproduction of known TES plant populations

Standard: As specified in species management guides

Precision: Moderate

Frequency: Annually

Responsibility: Fish and Wildlife

SOILS

Monitoring Objective: To evaluate the effectiveness of Forest Plan standards and guidelines in the prevention of loss in soil productivity.

Method: Field sample and measurement of soil loss and compaction on one project area per Ranger District per year.

Standard: No measurable loss in productivity

Precision: Moderate

Frequency: Annually

Responsibility: Soil and Watershed

TIMBER

Monitoring Objective: **To determine if the terrestrial and aquatic resources are being managed according to the standards and guidelines.

Method: Interdisciplinary review of two projects per year.

Standard: Appropriate number and distribution of green trees, snags, and coarse woody debris are left in harvested areas. Watershed analysis is completed prior to harvesting late successional stands in watersheds with less than 15 percent late successional forest remaining.

Precision: High

Frequency: Annually

Responsibility: Interdisciplinary

Monitoring Objective: To assure that the total volume sold during the Plan period (i.e.; 10 years) is within the Allowable Sale Quantity (ASQ) established by the Forest Plan.

Method: Evaluation of the cumulative volume sold

Standard: < 10% deviation from the Forest Plan ASQ averaged over the Plan period

Precision: High

Frequency: Annually

Responsibility: Timber

Monitoring Objective: To make appropriate adjustments to the suitable timberland base as site specific information becomes available.

Method: Compilation of timberland classification data gathered during project level planning

Standard: Areas greater than 10 acres in size which are misclassified are corrected in the planning data base

Precision: Moderate

Frequency: Annually

Responsibility: Timber/Land Management Planning

Monitoring Objective: Validation of timber growth and yield assumptions on which ASQ calculations are based.

Method: Analysis of growth within managed stands and comparison to Forest Plan growth and yield tables

Standard: Within \pm 10% of Forest Plan yield tables

Precision: Moderate

Frequency: One study within the Plan period

Responsibility: Timber

Monitoring Objective: To monitor volume harvested and acres regenerated by major forest type

Method: Report for each timber sale; programmed harvest statement

Standard: < 10% deviation from Forest Plan objectives (averaged over the plan period)

Precision: Moderate

Frequency: Annually

Responsibility: Timber

Monitoring Objective: To assure that harvested areas are reforested within 5 years of final harvest

Method: Stocking and condition surveys

Standard: Regional stocking standards

Precision: High

Frequency: 5th year following final harvest

Responsibility: Timber

Monitoring Objective: To assure that the effects of implementation of the prescribed timber management program are within the range of projected effects.

Method: Interdisciplinary review of selected timber management activities

Standard: Effects of timber management activities within \pm 10% of projected effects

Precision: Moderate

Frequency: A minimum of one activity review each year

Responsibility: Timber

VISUAL

Monitoring Objective: To assure that project level activities meet the Visual Quality Objectives as established in the Forest Plan.

Method: Field review and assessment of effects on visual quality

Standard: Compliance with Forest Plan VQOs

Precision: Moderate

Frequency: One project area per Ranger District per year

Responsibility: Recreation

Monitoring Objective: To determine if the desired visual character stated in the Forest plan is being maintained or achieved.

Method: Field review and assessment
Standard: Maintenance of prescribed visual character
Precision: Moderate
Frequency: Every 5 years
Responsibility: Recreation

WATERSHED

Monitoring Objective: To determine the rate of sediment deposition into Lake Pillsbury.

Method: Bathymetric surveys of the major arms entering the lake
Standard: < 5% increase in the rate of deposition attributable to Forest Service management activity
Precision: High
Frequency: 3-5 year intervals
Responsibility: Soil and Watershed

Monitoring Objective: **To determine if the aquatic, terrestrial, economic, and social resources are being managed according to the standards and guidelines for key watersheds.

Method: Interdisciplinary review of one project per year
Standard: Watershed analysis completed prior to activities. Presence and timing of activities, including restoration projects. No new roads constructed in roadless areas, and no net increases in road mileage.
Precision: High
Frequency: 3-5 year intervals
Responsibility: Interdisciplinary

Monitoring Objective: **To determine if the overall conditions of the watersheds continue to be productive over the long term.

Method: Evaluate results of the most recent inventory data and watershed analyses.
Standard: Retention of snags and coarse woody debris. Abundance and diversity of species associated with forest communities. Species presence Percent of land area affected by exotic species. Structure, composition, ecological processes, and ecosystem functions of aquatic and terrestrial habitat. Air quality meeting standards.
Precision: Moderate
Frequency: During each watershed analysis or watershed analysis update
Responsibility: Interdisciplinary

Monitoring Objective: To assure compliance with State and Federal drinking water standards.

Method: Sampling and analysis at locations where drinking water is provided
Standard: Compliance with State and Federal drinking water standards
Precision: High
Frequency: As prescribed by law
Responsibility: Engineering

Monitoring Objective: To assure watershed improvements are implemented as scheduled in the Forest Plan.

Method: Review of annual watershed accomplishments

Standard: Accomplishment of at least 90% of that scheduled in the Forest Plan (averaged over the plan period)

Precision: High

Frequency: Annually

Responsibility: Soil and Watershed

Monitoring Objective: To evaluate the effectiveness of Forest Plan standards and guidelines in affording appropriate protection to riparian and aquatic ecosystems.

Method: Field evaluation of streamside and riparian area condition within at least two project areas per year

Standard: Healthy, functioning riparian ecosystems

Precision: Moderate

Frequency: Annually

Responsibility: Soil and Watershed

Monitoring Objective: To assure Best Management Practices (BMPs) are implemented as appropriate and are accomplishing the intended purpose.

Method: Office and field review of one project per Ranger District per year

Standard: Implementation of BMPs as appropriate and adequate protection of water related resources

Precision: High

Frequency: Annually

Responsibility: Soil and Watershed

WILDERNESS

Monitoring Objective: To monitor levels of use to assure people impacts are within limits as determined through the application of the "Limits of Acceptable Change" (LAC) process.

Method: Field evaluation of change in selected high use sample areas in each Wilderness.

Standard: Impacts within limits of acceptable change

Precision: Moderate

Frequency: Annually

Responsibility: Recreation

WILDLIFE AND FISHERIES

Monitoring Objective: To ensure that habitat is maintained in specified amounts and distribution for Management Indicator Species of wildlife.

Method: Evaluation of all activities with the potential to cause changes in habitat capability for Management Indicator Species of wildlife.

Standard: Moderate or better quality habitat as described in the Habitat Capability Models

Precision: Moderate

Frequency: Each project with an annual summary

Responsibility: Fish and Wildlife

Monitoring Objective: To assess whether MIS populations are being affected; to determine that selected MIS are appropriate; and to determine whether standards and guidelines are effective

Method: Evaluation of the most recent inventory data and comparison to Habitat Capability Models

Standard: Habitat Capability Models

Precision: High

Frequency: Two species per year on a rotating basis

Responsibility: Fish and Wildlife

Monitoring Objective: To assure that management and recovery goals for threatened and endangered species are being achieved as specified in approved Recovery Plans.

Method: Evaluation of the results of the most recent inventory data and comparison to goals specified in Recovery Plans

Standard: Achievement of Recovery Plan goals

Precision: High

Frequency: Annually

Responsibility: Fish and Wildlife

Monitoring Objective: **To determine if habitat conditions for late successional forest associated species maintained where adequate and restored where inadequate

Method: Evaluate results of the most recent inventory data including ecological unit inventories, and review improvement project record.

Standard: Appropriate size, location, spatial distribution, species composition, and development of late successional and old growth forests Retention of snags and coarse woody debris. Abundance and diversity of species associated with late successional forest communities. Species presence Percent of land area affected by exotic species Structure, composition, ecological processes, and ecosystem functions of late successional and old growth forests.

Precision: Moderate

Frequency: Every 5-10 years

Responsibility: Interdisciplinary

Monitoring Objective: **To determine if the terrestrial resource is being managed according to the standards and guidelines.

Method: Interdisciplinary review of four projects per year.

Standard: Projects implemented consistent with land allocation and Forest-wide standards and guidelines, Regional Ecosystem Office review requirements, Late Successional Reserve assessments, and project specific requirements

Precision: High

Frequency: Annually

Responsibility: Interdisciplinary

Monitoring Objective: **To determine if the ecological health of the aquatic ecosystems are recovering or sufficiently maintained to support stable and well distributed populations desired fish species and stocks.

Method: Review of two streams per year.

Standard: Appropriate pool frequency and quality; percent fine sediment, size and quantity of coarse woody debris; water temperature; width to depth ratio; and bank stability and lower bank angle.

Precision: High

Frequency: Annually

Responsibility: Fish and Wildlife

Monitoring Objective: **To determine if desired habitat conditions for at-risk fish stocks maintained where adequate and restored where inadequate.

Method: Evaluate results of the most recent inventory data, and review habitat improvement project record.

Standard: Retention of snags and coarse woody debris. Abundance and diversity of at-risk stocks. Species presence. Percent of stream length affected by exotic species. Structure, composition, ecological processes, and ecosystem functions

Precision: Moderate

Frequency: Every 5-10 years

Responsibility: Fish and Wildlife

Monitoring Objective. To determine if planned level of fisheries habitat improvement is being accomplished.

Method. Evaluation of annual accomplishment reports

Standard. \pm 10% variation between actual and planned accomplishment

Precision: High

Frequency: Annually

Responsibility: Fish and Wildlife

**These monitoring objectives were published in the 1994 Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (President's Plan) The specific standards, precision requirements, frequency, and responsibility for monitoring implementation of the President's Plan and, therefore, portions of the Mendocino' Forest Plan, are currently being developed at the provincial and regional levels. The monitoring objectives, as stated in this monitoring plan, are subject to change as the provincial and regional monitoring guidelines are finalized.