Chapter 5
Implementation

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Introduction

The Forest Plan is used by applying the background information it contains along with its standards and guidelines, the Pacific Northwest Regional Guide, and appropriate Forest Service Manuals and Handbooks to ensure that Forest management achieves desired results "Implementation" is the process whereby management of the Forest is brought into compliance with the Forest Plan.

Implementation of the Winema National Forest Plan requires moving from an existing management program that is defined with budgets and targets for accomplishment to a new management program with a budget, goals, objectives, and standards that provide a different way of addressing the issues. The issues upon which this plan is based are discussed in chapter 3. Background about the ability of the Forest to provide certain goods and services is included in chapter 2. Chapter 4 contains the desired future condition of the Forest and the goals and objectives of Forest management. In combination, these define the way in which issues are to be resolved. Additional rationale for the decisions leading to this plan is included in the Record of Decision Chapter 4 also contains the management objectives and standards and guidelines which, if followed, should lead to the desired resolution of the issues. Estimated outputs and the budget expected to be needed to attain them are also included in chapter 4.

This chapter explains how management of the Forest will move toward implementing the decisions documented in the Record of Decision and in chapter 4. It includes descriptions of how specific project proposals are to be developed, how other plans are related to the Forest Plan, how the budgeting process will interact with the Forest plan and how project-level environmental analysis relates to the Forest Plan. A detailed monitoring plan is also included. The monitoring plan describes the process that the Forest Management Team will use to determine whether or not various aspects of the Forest Plan are being properly implemented.

The management direction in this Forest Plan was developed prior to the U.S. Fish and Wildlife Service's (FWS) listing, effective July 23, 1990, of the northern spotted owl as threatened. It was also developed prior to completion of work on a recovery plan for the owl Implementation of this Forest Plan will comply with the Endangered Species Act, as interpreted through consultation with the FWS, any interim management guidance, and eventually the recovery plan. Forest Plan implementation actions will be conducted so that conflicts with recommendations of the Interagency Scientific Committee will be avoided until superseded by subsequent direction

Implementation Direction

Implementation of the Forest Plan occurs through identification, selection, scheduling, and execution of management practices to meet management direction provided in the Plan. Implementation also involves responding to proposals by others for use and/or occupancy of National Forest System lands. In all cases, implementation is to be done in accordance with the direction in the Forest Plan.

Consistency With Other Instruments

The Forest Plan serves as the single land management plan for the Winema National Forest. It supersedes three other land management plans that have been in use on the Forest:

Land Use Plan for the McLoughlin-Klamath Planning Unit
Land Use Plan for the Chemult Planning Unit
Timber Resource Plan for the Winema National Forest

There are many planning documents that will be brought into compliance with the Forest Plan or developed under the Forest Plan. Among these are allotment management plans, capital investment plans, recreation site plans, and scenic viewshed guides. These documents are developed and maintained to assist with implementing the direction contained in this Forest Plan.

As soon as practicable (and generally within three years of approval of this Forest Plan), the Forest Supervisor will ensure that (subject to valid existing rights) all outstanding permits, contracts, cooperative agreements, and other instruments for occupancy and use of lands of the Winema National Forest are consistent with this Forest Plan. Timber sales under contract prior to issuance of the Forest Plan will be administered under the provisions of the existing contracts Changes to existing contracts may be proposed on a case-by-case basis where overriding resource considerations are present

Project Implementation and Scheduling

The management direction provided by this Forest plan comprises the sideboards within which project planning and implementation can occur. It defines management area goals and management standards that guide project activities toward achieving a desired future condition for the various management areas and, collectively, for the Forest This plan also provides detailed guidance which is intended to efficiently achieve the desired future condition. This guidance includes assumptions about appropriate management practices under various conditions. Analysis developed for individual projects or for multiproject areas will validate or invalidate the appropriateness of these assumptions in specific places. Within this guidance, projects are developed to efficiently and effectively accomplish the management goals and objectives.

The appendices to this Forest Plan include activity schedules of proposed projects. These activity schedules represent a pool of possible projects from which implementation schedules (specific, funded projects) are developed in conjunction with funding approvals. These schedules will routinely change as projects are implemented, removed, or rescheduled and as new projects are added. Projects are scheduled in response to the goals and objectives of this Forest Plan and annual budgets.

Environmental Analysis

The site-specific projects and activities proposed by this Forest Plan or developed to achieve the goals and objectives of this Plan are subject to environmental analysis prior to implementation, as required by the National Environmental Policy Act (NEPA). Analysis designed to validate the ability of segments of the Forest to contribute to the goals and objectives of the Forest Plan can be used to identify potential projects and to provide background information for the environmental analysis required by NEPA.

All of this analysis provides essential information for Forest Plan monitoring First, as project analyses are completed, new or emerging public issues or management concerns may be identified Second, the management direction designed to achieve forestwide and management area goals and objectives is validated by detailed analysis. Third, the site-specific data collected for project environmental analyses serves as a check on the correctness of the assigned management area and output estimates developed

for the Forest Plan All of the information developed in these analyses can be used in the monitoring process to determine when changes should be made to the Forest Plan.

Budget

The Forest Plan's scheduled projects (see the appendices) are translated into multiyear program budget proposals that identify needed expenditures. These budgets and programs are used for requesting and allocating the funds needed to implement this plan. The final approved budget will typically take into account broad national concerns both in the area of forest management and in areas as diverse as crime-fighting or insurance for savings and loan deposits. The final budget can be quite different from the original proposals simply because the Forest planning process cannot take into account these broader national issues. Upon approval of a final budget, the Forest finalizes and implements the annual program of work.

The purpose of the Forest Plan is to resolve the issues facing the Forest in a way that maximizes the net public benefit. The budget displayed in chapter 4 is an estimate of the costs necessary to do this. The budget calls for increases in funding and realignment of financing across program areas The budget outlined in chapter 4 is the best estimate of the funds needed to implement and monitor this Forest Plan. The costs are based upon a decade of activities and are represented as annual averages. It is anticipated that actual financing for each year will vary from the estimates. The estimated budget will be the basis for future year requests, but these requests will be designed to fully implement this Forest Plan, **not** to ensure that certain levels of financing are received. A monitoring item is included to track whether or not actual funding is sufficient to fully implement this Forest Plan. Monitoring budget implications can result in any of the actions listed in the "Monitoring and Evaluation Program" section, below.

Monitoring and Evaluation Program

Monitoring and evaluation comprise the management control system for the Forest Plan. They will provide information to the decision-maker and the public about the progress and results of implementing the Forest Plan. Monitoring and evaluation have distinctly different purposes and scopes. In general, monitoring is designed to gather the data necessary for evaluation During evaluation, data provided through monitoring are analyzed and interpreted.

The monitoring plan identifies the key activities and effects to be tracked during implementation of the Forest Plan to ensure that activities conform to standards and guidelines and that outputs satisfy the objectives of the plan Key items were selected based upon the requirements of NFMA, the importance in relation to resolution of issues (as discussed in the Record of Decision) and the likelihood that a deviation found in monitoring would cause a change in the Forest Plan.

Table 5-1 is a summary of the monitoring plan Following the table is a discussion for each item. The discussion provides details about the definition and application of the monitoring item. Each item includes a cost estimate broken into two categories: "base" and "added." Many of the monitoring elements have been performed for many years; others will require redirection of existing efforts, and others will require new approaches. Those portions of monitoring that have been done in the past or that would merely require realignment of existing efforts are associated with "base" costs. Monitoring efforts that are new and would require additional labor or equipment are associated with the "added" costs. All of these costs are incorporated in the budget estimate shown in chapter 4.

The first monitoring item, "Implementation of Standards and Guidelines," is intended to assure that all of the forestwide and management area standards and guidelines in chapter 4 are being properly implemented It covers important concerns in all areas of Forest management. The second monitoring item, "Outputs," includes the key Forest outputs to be tracked It is intended to provide for a quantitative

estimate of overall performance in terms of direct activities actually accomplished compared with the projections developed for the Forest Plan Additional elements are included for those items that require a forestwide view for appropriate evaluation. Many pieces of information are tracked in accordance with established Forest Service direction, but they are not included here because they are not considered key to monitoring or evaluating the implementation of this Forest Plan.

At intervals established in the plan, implementation will be evaluated to determine how well objectives have been met and how closely standards and guidelines have been applied. Based on this evaluation, the interdisciplinary team (ID Team) shall recommend to the Forest Supervisor such changes in management direction, revisions, or amendments to the Forest Plan as are deemed necessary. Figure 5-1 shows how the results of monitoring would typically be evaluated. The results of evaluating the information that is gathered in the monitoring process will vary depending on the magnitude of the problem and the risk associated with it.

The Forest Supervisor may take one or several of the following actions as a result of the evaluation and recommendations developed by the ID Team:

1 Take no action, after determining that objectives, standards and guidelines are being achieved.

2. Redirect District Rangers to improve application of standards and guidelines as projects are implemented. This may involve: (1) general direction, (2) specific changes in one or several ongoing projects, (3) additional interpretation of standards and guidelines as they apply to the problem at hand, or (4) any other action with the intent of ensuring proper application of existing Forest Plan guidance.

3 Modify standards and guidelines or specific management area guidance via a Forest Plan amendment. This may involve application of a standard or guideline to a specific location or more broadly across the Forest if evaluation determines that the practice is not effective or appropriate.

4 Modify the location of a management area on the ground. Minor changes involving boundary adjustments to apply better site-specific information will be monitored to determine if cumulative effects require further evaluation. Significant changes in management area assignments may be accomplished via a Forest Plan amendment

5. Amend the projected schedule of outputs.

6. Initiate revision of the Forest Plan. This would only occur when the Forest Supervisor determines that conditions or demands have changed significantly or when changes in RPA policies, goals, or objectives would have a significant effect on Forest programs.

It is expected that an annual monitoring and evaluation report will be developed by the ID Team. This report will summarize the results of monitoring and evaluate those results. It will include recommendations for action by the Forest Supervisor to deal with problem areas, as required by NFMA (36 CFR 219 12[k]).

Amendment and Revision

The Forest Plan incorporates legal mandates, professional judgment, and the public's stated concerns as to a future vision of the Forest It charts a path for getting there by developing management goals and objectives and translating them into management direction in the form of standards and guidelines. National Forest planning is a dynamic process and the products--Forest Plans--are similarly dynamic. Forest Plans can and should be modified as conditions warrant. As management direction is applied on the ground or as new information is gained about resources, the plan's goals and objectives, or the activities they generate, may no longer be appropriate. In such instances, activities may be tailored to fit the resource or planning objectives stated in the plan may be amended. The plan does not apply direction in site-specific management activities Instead, the plan provides the sideboards for these activities, and further analysis that leads toward implementation of individual projects examines the application of the plan in specific locations. Sometimes this detailed analysis or results of monitoring and evaluation may indicate the need for modification of the Forest Plan

The Forest Supervisor may amend the Forest Plan Based upon an analysis of the objectives, standards, and other contents of the Forest Plan, the Forest Supervisor shall determine whether a proposed amendment would result in a significant change in the Plan. If the change resulting from the proposed amendment is determined to be significant, the Forest Supervisor shall follow the same procedure as that required for development and approval of a Forest Plan. If the change resulting from the amendment is determined not to be significant for the purposes of the planning process, the Forest Supervisor may implement the amendment following appropriate public notification and satisfactory completion of NEPA procedures.

FIGURE 5-1

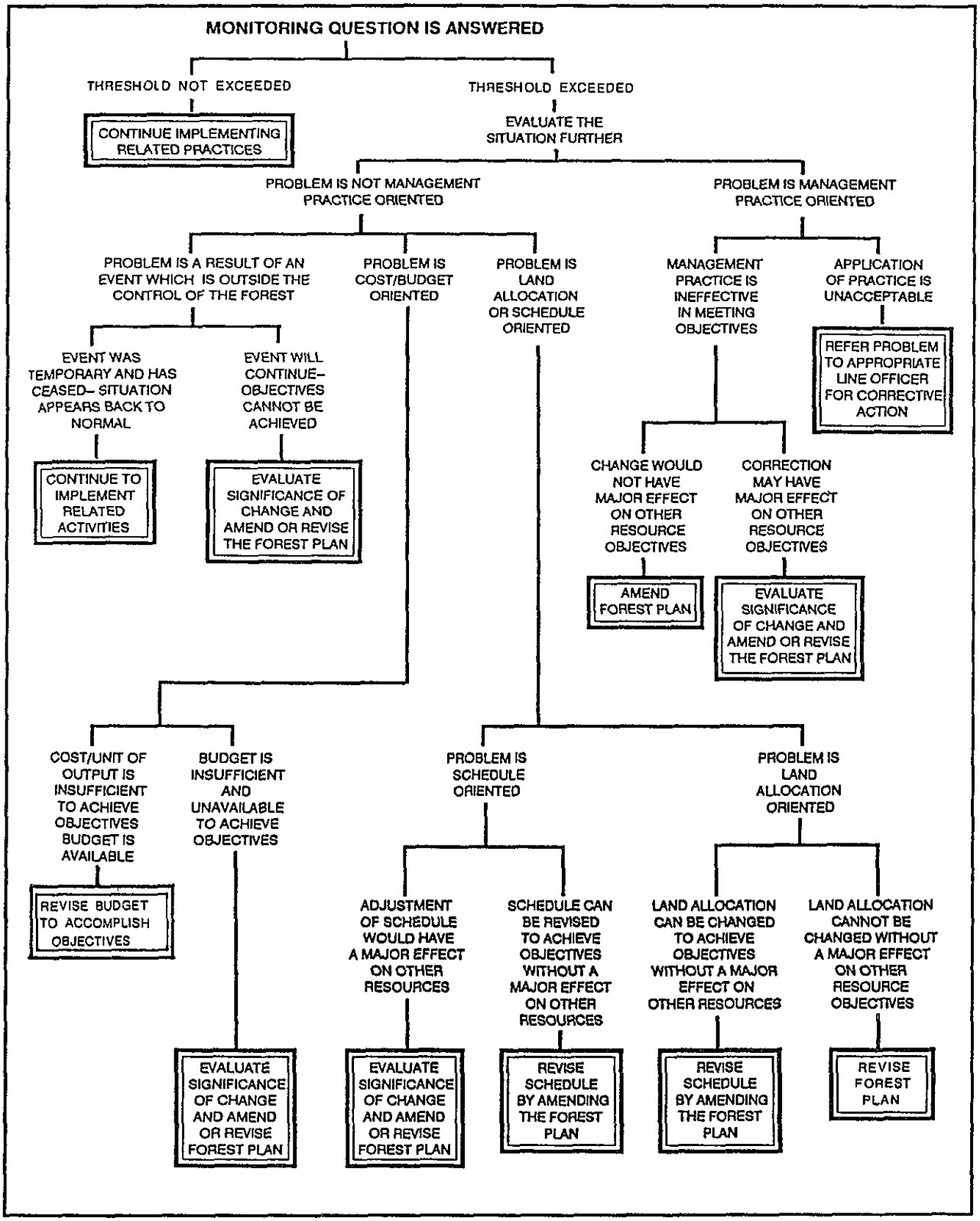
MONITORING QUESTION IS ANSWERED
THRESHOLD NOT EXCEEDED
CONTINUE IMPLEMENTING RELATED PRACTICES
THRESHOLD EXCEEDED
EVALUATE THE SITUATION FURTHER
PROBLEM IS NOT MANAGEMENT PRACTICE ORIENTED
PROBLEM IS MANAGEMENT PRACTICE ORIENTED
PROBLEM IS A RESULT OF AN EVENT WHICH IS OUTSIDE THE CONTROL OF THE FOREST
PROBLEM IS COST/BUDGET ORIENTED
PROBLEM IS LAND ALLOCATION OR SCHEDULE ORIENTED
MANAGEMENT PRACTICE IS INEFFECTIVE IN MEETING OBJECTIVES
APPLICATION OF PRACTICE IS UNACCEPTABLE
REFER PROBLEM TO APPROPRIATE LINE OFFICER FOR CORRECTIVE ACTION
EVENT WAS TEMPORARY AND HAS CEASED– SITUATION APPEARS BACK TO NORMAL
EVENT WILL CONTINUE– OBJECTIVES CANNOT BE ACHIEVED
CONTINUE TO IMPLEMENT RELATED ACTIVITIES
EVALUATE SIGNIFICANCE OF CHANGE AND AMEND OR REVISE THE FOREST PLAN
CHANGE WOULD NOT HAVE MAJOR EFFECT ON OTHER RESOURCE OBJECTIVES
CORRECTION MAY HAVE MAJOR EFFECT ON OTHER RESOURCE OBJECTIVES
AMEND FOREST PLAN
EVALUATE SIGNIFICANCE OF CHANGE AND AMEND OR REVISE THE FOREST PLAN
COST/UNIT OF OUTPUT IS INSUFFICIENT TO ACHIEVE OBJECTIVES BUDGET IS AVAILABLE
BUDGET IS INSUFFICIENT AND UNAVAILABLE TO ACHIEVE OBJECTIVES
PROBLEM IS SCHEDULE ORIENTED
PROBLEM IS LAND ALLOCATION ORIENTED
REVISE BUDGET TO ACCOMPLISH OBJECTIVES
ADJUSTMENT OF SCHEDULE WOULD HAVE A MAJOR EFFECT ON OTHER RESOURCES
SCHEDULE CAN BE REVISED TO ACHIEVE OBJECTIVES WITHOUT A MAJOR EFFECT ON OTHER RESOURCES
LAND ALLOCATION CAN BE CHANGED TO ACHIEVE OBJECTIVES WITHOUT A MAJOR EFFECT ON OTHER RESOURCES
LAND ALLOCATION CANNOT BE CHANGED WITHOUT A MAJOR EFFECT ON OTHER RESOURCE OBJECTIVES
EVALUATE SIGNIFICANCE OF CHANGE AND AMEND OR REVISE FOREST PLAN
EVALUATE SIGNIFICANCE OF CHANGE AND AMEND OR REVISE FOREST PLAN
REVISE SCHEDULE BY AMENDING THE FOREST PLAN
REVISE SCHEDULE BY AMENDING THE FOREST PLAN
REVISE FOREST PLAN

Table 5-1
Summary of Monitoring and Evaluation Program

MONITORING ITEM	OBJECTIVE OF MONITORING	THRESHOLD OF CONCERN/ VARIABILITY	SUGGESTED MONITORING METHODS	UNITS OF MEASURE	DATA PRECISION/ RELIABILITY	WHO WILL MONITOR	MONITORING FREQUENCY/ REPORT PERIOD	DATA LOCATION	ANNUAL COST (Base/ Added)
IMPLEMENTATION OF STANDARDS AND GUIDELINES	**Assure management direction is applied to projects**	Failure to implement S&G's without documentation & approval Change in MA acres of 5 percent or more (forest-wide)	Type 1 Functional Specialist reviews and Type 2 Interdisciplinary Management Team reviews	Variable	High/Mod	All Staff Officers	Annual/Annual	Planning Records	$25,000/$0
ACCOMPLISHMENT OF OUTPUTS AND SERVICES	**Provide for a quantitative estimate of performance**								
Allowable Sale Quantity		Decade total exceeds planned	Annual update and review of data	MMCF	High/High	Timber Staff	Annual/Annual	STARS	$10,000/$0
Timber Sale Program Quantity		10% above or 25% below accumulated plan amount	Annual update and review of data	MMCF and MMBF	High/High	Timber Staff	Annual/Annual	STARS and TSSA	$10,000/$0
Dead Lodgepole Pine Sold		10% below accumulated plan amount	Annual update and review of data	MMCF and MMBF	High/High	Timber Staff	Annual/Annual	STARS and TSSA	$100/$0
Ponderosa Pine Sold		10% below accumulated plan amount	Annual update and review of data	MMCF and MMBF	High/High	Timber Staff	Annual/Annual	STARS and TSSA	$100/$0
Silvicultural Treatments		25% variation from plan amount	Annual update and review of data	Acres	High/High	Timber Staff	Annual/Annual	STARS and TRACS	$10,000/$0
Reforestation		10% variation from plan amount or development of backlog	Annual update and review of data	Acres	High/High	Timber Staff	Annual/Annual	TRACS and National Needs Report	$2,000/$0
Timber Stand Improvement		10% variation from plan amount	Annual update and review of data	Acres	High/High	Timber Staff	Annual/Annual	TRACS and National Needs Report	$2000/$0
Fuel Treatment		10% variation from plan amount or development of backlog	Annual review of accomplishment report and land acres to be treated	Acres	High/High	Fire Staff	Annual/Annual	Accomplishment Report	$700/$0
Road Construction/ Reconstruction		10% variation from plan amount	Annual update and review of data	Miles	High/High	Engineering Staff	Annual/Annual	Annual Accomplishment Report	$250/$0

MONITORING ITEM	OBJECTIVE OF MONITORING	THRESHOLD OF CONCERN/ VARIABILITY	SUGGESTED MONITORING METHODS	UNITS OF MEASURE	DATA PRECISION/ RELIABILITY	WHO WILL MONITOR	MONITORING FREQUENCY/ REPORT PERIOD	DATA LOCATION	ANNUAL COST (Base/ Added)
ACCOMPLISHMENT OF OUTPUTS AND SERVICES (Continued) Total Road System	**Provide for a quantitative estimate of performance**	5% variation from plan level	Annual update and review of data	Miles	High/High	Engineering Staff	Annual/Annual	Transportation System Plan/ Inventory	$12,000/$0
Road Access Management (open/closed)		10% variation from plan levels	Annual update and review of data	Miles (open/ closed)	Mod/Mod	Engineering Staff	Annual/Annual	Road Management Plan/ Project EA's	$1,000/$0
Road Access Type (Passenger car/high clearance vehicle/intermittent road use)		10% variation from plan levels	Annual update and review of data	Miles (by type)	Mod/Mod	Engineering Staff	Annual/Annual	Road Management Plan/ Transportation System Plan	$250/$0
Developed Recreation Construction		10% variation from plan levels	Annual update and review of data	PAOT's	High/High	Resources Staff	Annual/Annual	Project Records	$200/$0
Trail Construction/ Reconstruction		10% variation from plan levels	Annual update and review of data	Miles	High/High	Resources Staff	Annual/Annual	Project records	$200/$0
Permitted Livestock Grazing		20% variation from plan levels	Annual update and review of data	AUMs	High/High	Resources Staff	Annual/Annual	Annual Grazing Statistics Report	$200/$0
Range Improvements		20% variation from plan levels	Annual update and review of data	Structures and acres	High/High	Resources Staff	Annual/Annual	Range Improvement Report	$200/$0
Wildlife Habitat Improvement		20% variation from plan levels	Annual update and review of data	Structures and acres	High/High	Resources Staff	Annual/Annual	Project Records, Annual Accomplishment Report	200/$0
Watershed Improvement Work		20% variation from plan levels	Annual update and review of data	Structures and Acres	High/High	Resources Staff	Annual/Annual	Project Records, Annual Accomplishment Report	$200/$0
BUDGET	Document the costs associated with carrying out the planned management prescriptions as compared with costs estimated in the Forest Plan	Annual 20% variation from plan amount, 5-year avg 10% variation from plan amount; insufficient funds to implement plan	Annual update and review of data	1982 dollars	High/Variable	Planning Staff	Annual/Annual	CADI-4 data base	$2,000/$0

MONITORING ITEM	OBJECTIVE OF MONITORING	THRESHOLD OF CONCERN/ VARIABILITY	SUGGESTED MONITORING METHODS	UNITS OF MEASURE	DATA PRECISION/ RELIABILITY	WHO WILL MONITOR	MONITORING FREQUENCY/ REPORT PERIOD	DATA LOCATION	ANNUAL COST (Base/ Added)
RECREATION									
Developed Recreation Sites	Determine if developed site capacity is adequate to meet demand and facilities and services are responsive to consumer expectations and desires	Use exceeds 90% of practical maximum capacity for the season, unsatisfied customers, unacceptable veg loss or erosion	Visitor contacts, actual use records, systematic sampling	RVD's	Mod/Mod	Resources Staff	Annual/Annual	RIM	$6,500/$0
Off-Road Vehicle Use	Determine if unacceptable resource or facility damage and/or user conflicts are resulting from ORV use	Unacceptable damage	Field observation, public comment	None	Low/Low	Resources Staff	Continuing/Annual	2300 Files	$1500/$0
Scenery	Assure VQO's are achieved	Percent of openings exceeds limits, desired diameters & species mix not achieved	Project Plans and EA review, field reviews, project and permanent photo monitoring	Acres	Mod/Mod	Resources Staff	Annual/Annual	Files, GIS etc	$3,000/$4,500
FISH AND WILDLIFE									
Mule Deer	Assure that habitat objectives are met. Validate habitat assumptions	10% decline in 1990 populations by management unit,5% decrease in habitat suitability over 5 years	Habitat suitability surveys, cooperative research, forage surveys	Various	Mod/Mod	Resources Staff	Continuing/As occurs	Files	$0/$11,700
Elk	Determine habitat use by elk in relationship to the level of use, distribution of use and period of use	Competition detrimental to mule deer <75% of elk requirements met by deer habitat management.	Review interagency elk study progress Project level documentation of use	Various	Mod/Mod	Resources Staff	Continuing/As occurs	Files	$0/$650
Fish Habitat	Assure that habitat objectives are met	Any decline in pool or stream quality (Class I or II streams), Any decline in fish numbers or species over 3 years, 20% failure of structures over 5 years,loss of macroinvertebrates	Stream Surveys, field checks, aquatic invertebrate sampling	Various	Mod/Mod	Resources Staff	Continuing/As occurs	Files	$0/$17,100
Bald Eagle	Assure that recovery plan objectives are met	Decline in nest site use, 10% decline in Klamath Basin populations from 1990 levels, decline in winter use, silvicultural treatments for replacement areas ineffective	Habitat use surveys	Various	Mod/Mod	Resources Staff	Annual/Annual	Files	$19,200/$0

MONITORING ITEM	OBJECTIVE OF MONITORING	THRESHOLD OF CONCERN/ VARIABILITY	SUGGESTED MONITORING METHODS	UNITS OF MEASURE	DATA PRECISION/ RELIABILITY	WHO WILL MONITOR	MONITORING FREQUENCY/ REPORT PERIOD	DATA LOCATION	ANNUAL COST (Base/ Added)
FISH AND WILDLIFE (Continued)									
Spotted Owl	Assure that the Forest maintains its share of habitat sufficient to maintain viable populations	Any decline in running 5-yr average occupancy rate and numbers of pairs from previous average, any designated habitat area fails to produce fledged birds in the last 3 years	R5/R6 Spotted Owl Inventory and Monitoring Handbook	Various	Mod/Mod	Resources Staff	Annual/Annual	Files	$24,000/$0
Peregrine Falcon	Determine use, assure that areas that are found to be used are maintained and protected	Once use is identified, any reduction in use	Habitat use surveys	Various	High/High	Resources Staff	Biennial/Biennial	Files	$0/$800
Lost River and Short Nosed Suckers	To identify habitat and assure that it is maintained or improved	Any detrimental impact	Habitat use surveys, cooperative research	Various	Mod/Mod	Resources Staff	Continuing/As occurs	Files	$5,000/$1,500
Primary Cavity Excavators	Assure that habitat objectives are met	10% of surveyed areas have less than 90% of described trees/snags. 10% decrease in snag numbers over 10 yrs. Cavities not created to support viable populations.	Habitat surveys	Various	Mod/Mod	Resources Staff	Annual/Annual	Files	$0/$5,000
Pileated Woodpecker	Assure that habitat will meet or exceed the Forest share of that needed to support viable populations	15% decline in detected presence, 20% decline in reproduction success, 25% difference between habitat definition criteria and actual habitat	Habitat suitability and occupancy surveys	Various	Mod/Mod	Resources Staff	Annual/Annual	Files	$0/$6,590
Northern Three-Toed Woodpecker	Assure that habitat will meet or exceed the Forest share of that needed to support viable populations	15% decline in detected presence, 20% decline in reproduction success, 25% difference between habitat definition criteria and actual habitat	Habitat suitability and occupancy surveys	Various	Mod/Mod	Resources Staff	Annual/Annual	Files	$0/$46,500
Goshawk	Assure that habitat will meet or exceed the Forest share of that needed to support viable populations	less than 75% of areas used	Habitat suitability and occupancy surveys	Various	Low/Mod	Resources Staff	Annual/Annual	Files	$0/$3,700

MONITORING ITEM	OBJECTIVE OF MONITORING	THRESHOLD OF CONCERN/ VARIABILITY	SUGGESTED MONITORING METHODS	UNITS OF MEASURE	DATA PRECISION/ RELIABILITY	WHO WILL MONITOR	MONITORING FREQUENCY/ REPORT PERIOD	DATA LOCATION	ANNUAL COST (Base/ Added)
FISH AND WILDLIFE (Continued)									
Pine Marten	Assure that habitat will meet or exceed the Forest share of that needed to support viable populations	10% of habitat is less than 95% suitable, 10% reduction in distribution after 5 years	Habitat suitability and occupancy surveys, cooperative research	Various	High/Mod	Resources Staff	Annual/Annual	Files	$0/$9,100
Sensitive Species (other than previously listed)	Assure that habitat objectives are met	10% decrease in existng animal or plant density	Field survey	Various	Mod/Mod	Resources Staff	2 yrs each 5/Biennial	Files	$0/$11,600
Plant and Animal Diversity	Assure that all native and desirable introduced or historic species and communities, and all seral stages of all plant associations are provided in a distribution and abundance to assure species diversity and viability	Any decrease in number of plant communities or animal species	Field surveys	Various	Mod/Low	Resources Staff	Annual/Annual	Files	$0/$10,900
OLD-GROWTH General	Assure that reserved old growth meets plan objectives	More than 10% difference between assumed acreage and actual acreage at the end of 5 years	Field inventory (baseline), field reviews	Acres	Mod/Mod	Resources Staff	Annual/5 years		$0/$1,860
RANGE Range Vegetation	Assure that range condition is in an upward trend in all allotments and particularly in riparian areas	Any riparian area with a downward trend, 10% outside riparian with a downward trend, range utilization 10% grater than authorized for 2 years, 5% increase in noxious weed acres over 5 years	Condition and trend transects, field observations, production/utilization studies		Mod/Mod	Resources Staff	Annual/Annual	Allotment management records	$0/$32,900

MONITORING ITEM	OBJECTIVE OF MONITORING	THRESHOLD OF CONCERN/ VARIABILITY	SUGGESTED MONITORING METHODS	UNITS OF MEASURE	DATA PRECISION/ RELIABILITY	WHO WILL MONITOR	MONITORING FREQUENCY/ REPORT PERIOD	DATA LOCATION	ANNUAL COST (Base/ Added)
TIMBER									
Timberland Suitability	Validate and increase the resolution of the timberland suitability assessment	30,000 acre change in suitable land base, improper harvest from unsuitable lands	EA reviews, sale reviews, stand exams, TM resource reviews	Acres	Low/Low	Timber Staff	Annual/Annual	2410 files	$10,000/$0
Timber Inventory	Verify the current inventory of lodgepole pine and mixed conifer sawtimber	25% change in inventory in either working group	Scheduled Forest inventory	MMCF and MMBF	High/Mod	Timber Staff	Once/Completion of Inventory	Inventory Data Base	$10,000/$0
Harvest Unit Size	Verify that timber harvest units meet the standards and guidelines for size and dispersion	Any harvest unit creates an opening larger than 40 acres	Update and review of data		High/High	Timber Staff	Annual/Annual	STARS	$2,000/$0
Regeneration Success	Verify that all cutting units are reforested in a timely manner	Failure to reforest any unit within 5 years, 1st year planting success below 80%, 3rd year planting success below 70%	Update and review data	Acres	Mod/High	Timber Staff	Annual/Annual	1st, 3rd and 5th year regen stocking surveys	$80,000/$0
Insects and Disease	Determine level of pest activities on the Forest	Plantation stocking levels reduced to within 25% of minimum stocking levels, loss of growth or mortality 10% above normal losses	Annual FPM aerial insect survey, field reviews, biological evaluations	Acres and severity	Low/Mod	Timber Staff	Annual/Five years	2410, 2470, 3400 files, annual pest detection maps	$10,000/$0
SOIL	Assure maintenance of soil productivity at levels that will support the Forest's resources	Greater than 20% of soils detrimentally impacted	Field sampling and observation, soil condition survey, monitor tree growth	Various	Low/Low	Resources Staff	Annual/Annual	Files	$13,000/$15,000
RIPARIAN AREA									
Cumulative Effects	Determine whether riparian area characteristics are being maintained or improved	Decrease in structure and function of channels & floodplains, decrease in plant communities and wildlife habitat, improper identification of areas	Permanent transects, photo points, field surveys	various	Mod/Mod	Resources Staff	Annual/Annual	Files	$0/$38,000
WATER									
Water quality	Compliance with State and Federal Water Quality Standards, effectiveness of BMP's	Loss of existing beneficial uses	Fields reviews, quantitative measurement of physical and chemical water quality parameters		Mod/Mod	Resources Staff Officer	Annual/Annual	STORET	$0/$51,300

MONITORING ITEM	OBJECTIVE OF MONITORING	THRESHOLD OF CONCERN/ VARIABILITY	SUGGESTED MONITORING METHODS	UNITS OF MEASURE	DATA PRECISION/ RELIABILITY	WHO WILL MONITOR	MONITORING FREQUENCY/ REPORT PERIOD	DATA LOCATION	ANNUAL COST (Base/ Added)
FACILITIES Transportation System	To ensure that the transportation system is serving the needs of the public and is providing adequate access for accomplishment of the Forest Plan Goals and Objectives	Types and miles of roads within 10% of Plan levels Inadequate road access	Annual update and review of data. Evaluation of public concerns EA's and program review summaries	Miles	Mod/Mod	Forest Engineer	Annual/Annual	Road Management Plan/ Transportation System Plan	$2,000/$0
SOCIAL AND ECONOMIC SETTING	**Consider the effects of National Forest management on communities adjacent to or near the Winema National Forest**								
Changes in Local Income		15% variation over 3 years	Review U S Census, State publications, County and local agency reports, etc	1982 Dollars	High/High	Planning Staff	Annual/Annual	Files	$100/$0
Changes in Local Population		15% variation over 3 years	Review U S Census, State publications, County and local agency reports, etc	Number of people	Mod/High	Planning Staff	Annual/Annual	Files	$100/$0
Changes in Local Employment Patterns		15% variation over 3 years	Review U S Census, State publications, County and local agency reports, etc	Persons by industry of occupation	Mod/High	Planning Staff	Annual/Annual	Files	$100/$0
Changes in Payments to Counties		*Payments < $7 92 MM or 10%* decrease from previous year	*Review of 25% fund* disbursement reports	*1982 dollars*	*High/High*	*Planning Staff*	Annual/Annual	Files	$100/$0
Changes in Lifestyles, Attitudes, Beliefs or Values		Trend toward Forest/ Community conflict or identified problems	Conduct interviews with key publics and opinion leaders in communities, opinion polls, observation, etc (FSH 1909 17)	Subjective	Low/Low	Planning Staff	Annual/Annual	Files, newspapers, anecdotal data	$2500/$0
Changes in Forest Contribution to Area Forest Products Industry		Shifts which threaten the local economy	Track raw material flow to mills	MBF by mill location	High/High	Planning Staff	Annual/Annual	FS-2400-46	$1000/$0

Monitoring Element: Implementation of Standards and Guidelines

Monitoring Objective

1. Assure that Forest Plan standards and guidelines are being implemented for projects

Management Area

All management areas.

Monitoring Questions

1. Are standards and guidelines being implemented for project activities?

2. Are exceptions and adjustments (including Management Area boundary adjustments) being coordinated with appropriate specialists and being documented?

3. Are sizes and locations of Management Areas being significantly altered from those depicted in the Forest Plan?

4. Are Management Area locations, as implemented, consistent with the area descriptions in the standards and guidelines?

Threshold of Concern

Any failure to implement standards and guidelines without appropriate documentation and approval.

Any instance of Management Area standards and guidelines being applied to a land area that is not consistent with the description provided in the Management Area standards and guidelines

Any change in Management Area acreage (forestwide) of 5 percent or more

NOTE: Nonimplementation of standards and guidelines will cause functional review of the particular program or project to determine reasons for nonimplementation and to determine if the standard can be implemented or is necessary or if additional guidance or other action is necessary. Changes in management area acres will be evaluated for their significance to forestwide objectives and may trigger a review or amendment of the Forest plan.

Suggested Sampling Methods

1. Type 1 Reviews: Supervisor's Office specialists and District counterparts will functionally review 1 project or 5 percent of all projects on the Forest annually, whichever is greater. Monitoring will include EA review and post-project review to determine if appropriate functional standards are included and implemented

2 Type 2 Reviews: Forest Staff, District Rangers, and specialists (an interdisciplinary team) will conduct project reviews on the greater of 1 project or 5 percent of all the projects on the Forest annually. These reviews will emphasize determination of whether standards and guidelines are included in documentation and are implemented in the projects

3. Supervisor's Office specialists will annually summarize changes to Management Area acreages based upon information supplied from the districts and collected in the above reviews.

Type 1 reviews are performed by specialists and focus on their area of expertise and on projects they select. These reviews may identify problems which can be given a Type 2 review. Type 2 reviews will be performed on projects selected by the Management Team and may, or may not, involve the same projects as the Type 1 reviews. Projects to be reviewed will be chosen from the pool of all projects on the Forest.

Expected Precision and Reliability

The precision of project reviews is moderate to high, the reliability is low to moderate.

Responsible Staff

District Rangers and Forest Staff. Forest staff will coordinate project review, sampling methods, compilation of data, and Forest reports.

Annual Monitoring Cost

Type 1 reviews: $500 per review (estimate 30 per year minimum)
Type 2 reviews: $2500 per review (estimate 4 per year minimum)

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$25,000
ADDED	$0
TOTAL	$25,000

Note: For this and subsequent elements average annual costs are broken out as follows:

Base Costs: Costs that have historically been expended for this or similar type work. Usually this includes salary, travel and incidental expenses of current employees.

Added Costs: Costs which have not been included in past budgets. Usually this includes needed hardware items, contract work, labor or other expenses beyond those experienced in the past.

Monitoring Element: Accomplishment of Outputs and Services

Monitoring Objective

1 Provide for a quantitative estimate of performance

Management Area

All management areas.

Monitoring Questions

1. Are the outputs and services projected by the Forest Plan being achieved?

Threshold of Concern

As noted in the following table

MONITORING ITEM	THRESHOLD OF CONCERN	METHODS	UNITS OF MEASURE	PRECISION/ RELIABILITY	WHO?	COST BASE/ADDED
Allowable Sale Quantity	Decade total exceeds planned	Annual update and review of STARS data base	MMCF	High/High	Timber Staff	$10,000/$0
Timber Sale Program Quantity	10% above or 25% below accumulated Plan amount	Annual update and review of STARS and TSSA data bases	MMCF & MMBF	High/High	Timber Staff	$10,000/$0
Dead Lodgepole Pine Sold	10% below accumulated Plan amount	Annual update and review of STARS and TSSA data bases	MMCF & MMBF	High/High	Timber Staff	$100/$0
Ponderosa Pine Sold	10% below accumulated Plan amount	Annual update and review of STARS and TSSA data bases	MMCF & MMBF	High/High	Timber Staff	$100/$0
Silvicultural Treatments	25% variation from Plan amount	Annual review of the STARS and TRACS data bases	Acres	High/High	Timber Staff	$10,000/$0
Reforestation	10% variation from Plan amount or development of backlog	Annual update and review of TRACS data base and National Needs Report	Acres	High/High	Timber Staff	$2,000/$0
Timber Stand Improvement	10% variation from Plan amounts	Annual update and review of TRACS data base and National *Needs Report*	Acres	High/High	Timber Staff	$2,000/$0
Fuel Treatment	10% variation from Plan amount or development of backlog	Annual Review of accomplishment report and land acres treated	Acres	High/High	Fire Staff	$700/$0
Road Construction/ Reconstruction	10% variation from Plan amount	Annual accomplishment reports	Miles	High/High	Engineering Staff	$250/$0
Total Road System	5% variation form Plan level	Review Transportation System Plan/Inventory	Miles	Mod/Mod	Engineering Staff	$12,000/$0
Road Access Management (open/closed)	10% variation from Plan levels	Review Road Management Plan, Project EA's	Miles (open/closed)	Mod/Mod	Engineering Staff	$1,000/$0

MONITORING ITEM	THRESHOLD OF CONCERN	METHODS	UNITS OF MEASURE	PRECISION/ RELIABILITY	WHO?	COST BASE/ADDED
Road Access Type (Passenger car/high clearance vehicle/ intermittent road use)	10% variation from Plan levels	Review Road Management Plan, Transportation System Plan	Miles (by type)	Mod/Mod	Engineering Staff	$250/$0
Developed Recreation Construction	10% variation from Plan levels	Project Records	PAOT's	High/High	Resources Staff	$200/$0
Trail Construction/Reconstruction	10% variation from Plan levels	Project Records	Miles	High/High	Resources Staff	$200/$0
Permitted Livestock Grazing	20% variation from Plan levels	Annual Grazing Statistics Report	AUMs	High/High	Resources Staff	$200/$0
Range Improvements	20% variation from Plan levels	Project Records, Annual Accomplishment Report	Structures and acres	High/High	Resources Staff	$200/$0
Wildlife Habitat Improvement	20% variation from Plan levels	Project records, Annual Accomplishment Report	Structures and Acres	High/High	Resources Staff	$200/$0
Watershed Improvement Work	20% variation from Plan levels	Project Records, Annual Accomplishment Report	Structures and Acres	High/High	Resources Staff	$200/$0

Suggested Sampling Methods
Annually, as noted in the above table.

Expected Precision and Reliability
As noted in the above table.

Responsible Staff
As noted in the above table.

Annual Monitoring Cost

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$49,600
ADDED	$0
TOTAL	$49,600

Monitoring Element: Budget

Monitoring Objective

Document the costs associated with carrying out the planned management prescriptions as compared with costs estimated in the Forest Plan.

Management Area

Forestwide

Monitoring Questions

1 Is funding received by the Forest consistent with budget estimates developed for the Forest plan?

2. Is funding sufficient to implement the Forest Plan?

Threshold of Concern

Annual variation of more than 20 percent, five-year average variation of more than 10 percent or insufficient funds to implement the Forest Plan.

Suggested Sampling Methods

Query the actual expenditures from the CADI-4 data base (NFC) after the end of each fiscal year. Adjust these costs to a 1982 base year for comparison to the average annual costs noted in chapter 4 of the Forest Plan The comparison should be for each item listed in chapter 4. The threshold of concern applies to each item in the list.

For each item which exceeds the threshold, evaluate the reasons for the variation in relation to output levels projected and achieved, anticipated trends and other factors in order to determine whether or not the variation indicates a problem in achieving goals of the Forest Plan.

Expected Precision and Reliability

Precision should be excellent. Reliability will be moderate.

Responsible Staff

Planning Staff

Annual Monitoring Cost

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$2,000
ADDED	$0
TOTAL	$2,000

Monitoring Element: Developed Recreation Sites

Monitoring Objective

Determine if developed site capacity is adequate to meet demand and if facilities and services are responsive to customer expectations and desires.

Management Area

Management Area 2 - Developed Recreation

Monitoring Questions

1. Is additional developed site capacity needed to meet demand?
2. Are customer needs being met?
3. Is overuse causing unacceptable resource damage to the site?

Threshold of Concern

Use exceeds 90 percent of practical maximum capacity for the season.

Customer feedback indicates that desired facilities and services compatible with the ROS class and development level are not being provided.

User impacts are causing unacceptable vegetation loss or soil erosion.

Suggested Sampling Methods

1. Monitor level of use and condition of facilities throughout the use season. Use systematic sampling techniques to periodically measure use. Report actual use annually per RIM instructions.
2. Collect customer comments obtained through visitor contacts and from fee envelopes and correspondence. Summarize feedback at the end of the season for District Ranger and Resource Staff review
3. Resource Staff conducts field reviews of developed sites annually to assess facility and site condition.

Expected Precision and Reliability

Precision and reliability of use data is moderate at fee sites and low at other sites. Reliability of customer feedback is variable.

Responsible Staff

Resource Staff

Annual Monitoring Cost

Data collection and reporting, $3,000 to $5,000; Field reviews, $1,000 to $1,500.

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$6,500
ADDED	$0
TOTAL	$6,500

Monitoring Element: Off-Road Vehicle (ORV) Use

Monitoring Objective

Determine if unacceptable resource or facility damage and/or user conflicts are resulting from ORV use.

Management Area

All management areas

Monitoring Questions

1. Is ORV use occurring in areas where prohibited or restricted?
2. Is ORV use causing unacceptable resource damage in areas where use is currently permitted?
3. Are conflicts occurring between motorized and nonmotorized uses and between motorized use and wildlife?

Threshold of Concern

Unacceptable effects are noted.

Suggested Sampling Methods

1. Monitor use and on-site conditions through field observation.
2. Review public comments concerning ORV use.

Expected Precision and Reliability

Low precision in use data collection due to the dispersed nature of this activity. The reliability of public comments will be variable.

Responsible Staff

Resource Staff

Annual Monitoring Cost

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$1,500
ADDED	$0
TOTAL	$1,500

Monitoring Element: Scenery

Monitoring Objective

Assure that the visual quality objectives are being achieved across the Forest

Management Area

All management areas.

Monitoring Questions

1. Are the allocated visual quality levels being achieved?

2. Are vegetative management and viewshed implementation guides being completed as scheduled?

3. Are the environmental design arts regularly included as part of the project environmental analysis planning process?

Threshold of Concern

When the percentage of created opening exceeds the standards and guidelines for retention and partial retention visual quality levels on a viewshed basis.

When desired target diameters and mix of tree species are not being achieved

When scenic management objectives are traded off to implement other resource activities in the scenic management areas.

Suggested Sampling Methods

1. Viewshed reviews will include a comparison of anticipated and actual effects. Viewsheds may be assessed using computer analyses for predictions of project implementation effects as well as verification after project completion.

2. Predicted changes in condition of scenic viewsheds will be assessed on a cumulative project basis and created openings recorded by size (acres) and estimated time of release (year) in TRI/GIS or other available system Management Reviews and reports will be made at least annually.

3. Camera point photography will be used to visually monitor scenic condition across the Forest over time This requires establishment of a network of long-term camera point monument locations. Monitoring photography will be completed on a 3- to 5-year frequency. Special attention will be paid to the condition of scenery as viewed from identified travel routes affecting other agencies or interested parties such as Crater Lake National Park

Expected Precision and Reliability

The visual and analytical data for monitoring scenic condition within viewsheds is collected with a moderate degree of accuracy. The data will have a moderate level of reliability. Precision will vary somewhat depending on the data used and the computer capability available at the time.

Responsible Staff

Forest Resources Staff

Annual Monitoring Cost

$1,500/District X 3 Districts = $4,500.

Additional monitoring is included in project administration costs.

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$3,000
ADDED	$4,500
TOTAL	$7,500

Monitoring Element: Wildlife - Mule Deer

Monitoring Objective

1. Assure that habitat objectives are met

2 Validate habitat assumptions.

Management Area

All management areas with emphasis on MA 10 and MA 12.

Monitoring Questions

1 What is the relationship between habitat and population?

2 What is the habitat variable that most limits the population of mule deer?

3 What are the cumulative effects of open roads, alterations in cover, alterations of forage, livestock competition, water developments, and cover/forage distribution on deer habitat suitability?

4. What is the longevity of mule deer habitat structural and nonstructural improvements?

5 What is the primary cause of the decline of mule deer herds in the area?

Threshold of Concern

Monitoring questions 1, 2, and 5: A decline exceeding 10 percent of current (1990) populations of mule deer on any management unit influenced by the Forest.

Monitoring questions 1, 2, 3· A cumulative decrease of habitat suitability greater than 5 percent over five years A cumulative decrease of any one of the habitat suitability index factors greater than 5 percent over five years.

Monitoring question 4. Functional or structural failure rate of structural or nonstructural habitat improvements exceeding 10 percent over five years Failure to maintain 95 percent of structural improvements over five years. Minor maintenance is expected and is not considered failure.

Suggested Sampling Methods

1. Develop baseline data to determine changes in mule deer habitat suitability based on Interagency TAC Mule Deer Model on random sample township-sized areas. Initially survey Forest over three-year period. Complete resurvey every three years.

2. Cooperate with research study to determine causes of mule deer decline.

3. Monitor forage condition, trend, production and utilization in riparian areas, winter range, and summer range bitterbrush communities. Complete analysis within five years, resurvey and analyze changes after next five years

4. Monitor all structural and nonstructural habitat improvements in the first, second, and fifth year following project completion to evaluate structural and functional success. Monitor at least 20 percent of the structures annually.

Expected Precision and Reliability

Precision of habitat data and modeling can be high. Reliability for comparison of alternatives is high. Reliability for determining populations is low.

Precision of research study data is high. Reliability is unknown.

Precision and reliability of forage data is moderate.

Precision of improvement monitoring is high, reliability is moderate.

Responsible Staff

Forest Resources Staff will coordinate project review, sampling methods, compilation of data, and Forest reports. Forest Resources Staff will also coordinate with other agencies in research needs.

Annual Monitoring Cost

Baseline HSI sampling: $ 5,400 annually.
Forage monitoring: $ 4,500 annually.
Habitat Improvement monitoring: $ 1,800 annually.
Total annual cost: $11,700.

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$11,700
TOTAL	$11,700

Remarks

Research is needed to determine the causes of mule deer population decline in south-central Oregon. This will probably involve historical data correlations and radio telemetry.

Cooperative research $3 million to $5 million for 6 - 10 years. Winema N.F. cooperative share estimate 10 percent of total or $300,000 - $500,000. Assuming 10 year study would mean $30,000 - $50,000 annually. S.O. coordination cost $2,000 annually.

Monitoring Element: Wildlife - Elk

Monitoring Objective

Determine habitat use by elk in relationship to the level of use, distribution of use, and period of use. Use in conjunction with the results of the elk study to determine if there are conflicts with mule deer management and ultimately to determine habitat management objectives for both elk and mule deer.

Management Area

All management areas.

Monitoring Questions

1. What are the habitat requirements for elk on the Forest?
2. What is the amount of use, the location of use, and the periods of use of habitat on the Forest by elk?
3 Are there conflicts with habitat use between mule deer and elk?

Threshold of Concern

Competition detrimental to mule deer exhibited.

Less than 75 percent of the habitat requirements of elk met by deer habitat management.

Suggested Sampling Methods

1. Review progress and results of interagency elk study east of HWY 97.
2. Determine and document elk and deer habitat usage at the project level.

Expected Precision and Reliability

Precision and reliability moderate.

Responsible Staff

Forest Resources Staff.

Annual Monitoring Cost

No additional costs are identified for surveys. They will be completed with other project surveys and timber sale surveys.

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$650
TOTAL	$650

Remarks

Research is needed to determine elk population and distributional dynamics in south-central Oregon. Currently such a study is underway. Estimated cost to the Forest is $6,500 per year for 3 years = $19,500.

Monitoring Element: Fish Habitat

Monitoring Objective

Assure that fish habitat objectives are met

Management Area

All except MA 6 and MA 13.

Monitoring Questions

1. Is fish habitat capability increasing to the 80 percent level?
2. Is the fish population changing in terms of numbers, species composition, or age structure?
3. What are the effects of fish habitat improvement structures on stream channel configuration, large woody material, and fish populations?
4. What is the longevity of stream habitat structures?
5. What are the cumulative effects of activities on fish habitat capability and the aquatic ecosystem?

Threshold of Concern

Monitoring questions 1 and 3: Any decline in pool volume, area or average maximum depth of Class I or Class II streams

Monitoring questions 1 and 2: Any decline (over 3 years or more) of fish numbers or numbers of fish species.

Monitoring question 4: Functional or structural failure rate of habitat improvement structures exceeding 20 percent over five years Minor maintenance is expected and is not considered failure.

Monitoring question 5: A one scale-class reduction in the community tolerance quotient for macroinvertebrates as measured at established critical reach stations by basin.

Suggested Sampling Methods

1. Develop baseline data to determine changes in fish habitat capability based on standard Region 6 method developed by Hankin and Reeves Initially survey all Forest streams during a five year period. Approximately five percent of the stream miles will be resurveyed annually. These stream miles will be well distributed and should focus on the most sensitive habitat.
2. Monitor all habitat improvement projects in the first, second, and fifth year following project completion to evaluate structural and functional success. Monitor at least 20 percent of the structures annually. Monitoring of structures will include the installation of photopoints.

3. Monitoring of threatened, endangered or sensitive fish populations is addressed in the Threatened, endangered and sensitive species monitoring section.

4. Develop baseline stations for aquatic invertebrate sampling. Approximately 25 stations will be established. Half of the aquatic invertebrate sites will be monitored annually.

Expected Precision and Reliability

The monitoring will provide information that will be moderately to highly precise and reliable. It will provide excellent information on fish habitat quality, quantity, and trends. Aquatic invertebrate monitoring gives a precise and reliable picture of the overall "health" of the aquatic ecosystem.

Responsible Staff

Forest Resources Staff coordinates sampling methods, compilation of data, and Forest reports.

Annual Monitoring Cost

Initial cost of survey: 250 mi. (all fish-bearing plus suspects and unknowns) at $500/mi. = $125,000 At 50 mi /yr = $25,000 for five years. Annual costs of survey after the initial five-year period = $6,500 annually. Total decade cost = $157,500

Invertebrate monitoring: $7,500 initial set-up for 25 stations. $4,500 annually monitoring thereafter. Total decade cost. $12,000.

Year		Year	
1	$32,700	6	$7,200
2	25,700	7	7,200
3	25,700	8	7,200
4	25,700	9	7,200
5	25,700	10	7,200

Grand decade total: $171,000.

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$17,100
TOTAL	$17,100

Monitoring Element: Wildlife - Bald Eagle

Monitoring Objective

Assure that Recovery Plan objectives for bald eagle are being met.

Management Area

All except MA 6.

Monitoring Questions

1. Is the bald eagle population approaching recovery objectives?
2. Are all known and identified potential nest sites protected in accordance with the Recovery Plan? Has a site plan for each nest site been written?
3. Are nest sites producing young?
4. Is the winter roost receiving use?
5. Is management of bald eagle replacement habitat producing stand conditions that meet objectives for large trees?
6. Is replacement area habitat receiving use by bald eagle?

Threshold of Concern

Monitoring questions 1 and 2: Active nest site is unoccupied 2 years in succession. If unoccupied for 2 years in succession determine the causes and correct the situation if possible.

Monitoring question 2: Any site not protected. More than 10 percent sites with unfinished site plans two years after implementation.

Monitoring question 1: More than a 10 percent percent decline of the bald eagle population in the Klamath Basin.

Monitoring question 4: Decrease of winter roost use greater than 20 percent over previous 2 years average.

Monitoring question 5: Silviculturally treated replacement areas not releasing or achieving growth rates as anticipated after five years implementation.

Monitoring question 6: No use of replacement area within 10 year of implementation.

Suggested Sampling Methods

1. Continue Annual Interagency survey of nest sites in the Klamath Basin.
2. Continue annual winter roost surveys.

3. Field survey potential nest sites, resurvey at two-year intervals.

4. Field survey replacement habitat, resurvey at five-year intervals.

5. Survey treated replacement area growth rates and such at five-year intervals.

Expected Precision and Reliability

Nest site and winter roost surveys have high precision, moderate to low reliability. Survey of potential sites and replacement habitat for use has moderate precision, moderate reliability. Survey of treated areas has high precision, moderate reliability.

Responsible Staff

Forest Resources Staff coordinates compilation of data and Forest report.

Annual Monitoring Cost

Nest site monitoring: $500/site/year.
Winter roost monitoring: $5,000 per year.

Annual costs variable upward as nest sites increase to objective levels.

Year		Year	
1	$17,000	6	$19,500
2	17,500	7	20,000
3	18,000	8	20,500
4	18,500	9	21,000
5	19,000	10	21,000

Total decade cost: $192,000.

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$19,200
ADDED	$0
TOTAL	$19,200

Monitoring Element: Wildlife - Spotted Owl

Monitoring Objective

Assure that the Forest meets and maintains its share of habitat sufficient to maintain viable populations of spotted owl.

Management Area

All

Monitoring Questions

1 Is designated spotted owl habitat occupied by a pair of reproductively successful spotted owls in any given year?

2. How correct are the assumptions and outcomes of implementing standards and guidelines?

3. What is spotted owl population trend?

4. Is potential habitat being surveyed?

Threshold of Concern

Any decline in the running five-year average of occupancy rate and numbers of pair from the previous five-year average.

Any designated habitat area fails to produce fledged birds in the last 3 years.

Suggested Sampling Methods

1. Use methods detailed in R5/R6 Spotted Owl Inventory and Monitoring Handbook monitoring 50 percent of designated habitat annually.

2 Monitor 20 percent of habitat outside of designated habitat annually.

Expected Precision and Reliability

Precision is high, reliability is moderate to high.

Responsible Staff

Forest Resources Staff coordinates data compilation and reports. Sampling methods are coordinated by Regional Office.

Annual Monitoring Cost

SOHA monitoring: $20,000 annually.
Random survey of non-designated habitat. $4,000 annually.

Total annual cost: $24,000.
Total decade cost: $240,000.

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$24,000
ADDED	$0
TOTAL	$24,000

Monitoring Element: Wildlife - Peregrine Falcon

Monitoring Objective

Determine peregrine falcon use on the Winema N.F., assure that areas that are found to be used by peregrine falcon are maintained and protected.

Management Area

All.

Monitoring Questions

1. Are there peregrine falcon nesting or feeding on the Winema National Forest?
2. Are surveys being conducted to locate nest and roost sites?

Threshold of Concern

If found, any reduction in use by peregrine falcon.

Suggested Sampling Methods

1. Survey every potential peregrine nesting habitat every two years to determine and evaluate use. Investigate specific reports of peregrine falcon
2. Cooperate with any Crater Lake National Park studies that may determine peregrine feeding areas.

Expected Precision and Reliability

Precision high, reliability moderate to high.

Responsible Staff

Forest Resource Staff coordinates sampling methods, compilation of data, and Forest report.

Annual Monitoring Cost

Assume 10 potential sites at 1 day/year each at $120/day = $1,200 biennially. S.O. annual cost $200

Year		Year	
1	$1,400	6	$200
2	200	7	1,400
3	1,400	8	200
4	200	9	1,400
5	1,400	10	200

Total decade cost: $8,000

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$800
TOTAL	$800

Monitoring Element: Lost River and Shortnosed Suckers

Monitoring Objective

To identify Lost River and shortnosed sucker habitat on the Forest and to assure that that habitat is maintained or improved.

Management Area

All Management Areas potentially affect sucker habitat, however MA 8 is directly concerned with the suckers

Monitoring Questions

1 What are the habitat requirements for suckers on the Forest?

2 What is the relationship between the suckers' viability and habitat on the Forest?

3 What are the trends in the suckers' population?

Threshold of Concern

Any detrimental impact to habitat.

Suggested Sampling Methods

1. Participate in the cooperative sucker study currently underway.

2. Survey and document use by the suckers on the Forest.

Expected Precision and Reliability

Not applicable.

Responsible Staff

Forest Resources Staff.

Annual Monitoring Cost

No costs are identified for surveys. These will be completed with project surveys or through stream surveys. Ongoing cooperative research: $5,000 annually.

Coordination requirements: $1,500 annually.

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$5,000
ADDED	$1,500
TOTAL	$6,500

Monitoring Element: Wildlife - Primary Cavity Excavators

Monitoring Objective

Assure that the number, size, and distribution of old growth habitat, green trees, and snags meet the habitat capability objective of 40 percent or greater potential population

Management Area

All forested management areas have habitat capability for woodpeckers but only those where timber harvest or fuelwood gathering is permitted will be significantly affected.

Monitoring Questions

1. Are snags and replacement trees being left in the right numbers, sizes, and distribution on lands available for timber removal?

2. Are snags and replacement trees being maintained on all other lands?

3 Are management indicator species (pileated woodpecker, three-toed woodpecker) occupying the habitat?

Threshold of Concern

1. More than 10 percent of the surveyed areas have less than 90 percent of the described trees and snags.

2 More than 10 percent decrease in snag numbers shown in consecutive forestwide timber inventories (done every 10 years).

3. Cavities are not being created to support a viable population of secondary cavity users.

Suggested Sampling Methods

1. Examine habitat on 20 percent of timber sales within one year of sale closure per district annually.

2. Evaluate timber inventory plot data each ten year period.

3 Establish and measure transects to measure longevity of snags and woody material in areas where fuelwood is gathered. The monitoring interval is every two years.

Expected Precision and Reliability

Precision and reliability are expected to be moderate.

Responsible Staff

Forest Resource Staff

Annual Monitoring Cost

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$5,000
TOTAL	$5,000

Remarks

Research is needed to establish habitat relationships and population levels by physiographic province. Local conservation groups can be used to establish and read transects to determine use by cavity nesters.

Monitoring Element: Wildlife - Pileated Woodpecker

Monitoring Objective

Assure that habitat that will meet or exceed the Forest share of that needed to meet viable populations of pileated woodpecker is provided and maintained.

Management Area

Management Area 7.

Monitoring Questions

1. Are the number of areas identified in the plan being maintained?
2. Are the areas meeting the definition of suitable habitat as specified in the Forest plan?
3. Are the areas occupied and productive?
4 Are the size, distribution, and definition of old growth adequate for pileated woodpecker use?

Threshold of Concern

1. Habitat suitability is less than minimum standards
2. Decline of more than 15 percent in detected presence.
3. Habitat area numbers and distribution less than minimum requirements.
4 Decline of more than 20 percent in occupancy or reproduction success (nest failure).
5. More than 25 percent difference in size requirements, distributional requirements, or habitat definition criteria between current pileated research and habitat as specified in the plan.

Suggested Sampling Methods

1 Monitoring question 1 and 2. Examine 50 or 25 percent of the habitat areas annually (depending on the year) to sample for maintenance of habitat effectiveness for pileated woodpeckers (including both the 300 acres of designated old growth habitat and the 300 acres of foraging habitat). Establish permanent plots for sampling habitat capability; use Habitat Suitability Index Model (Schroeder 1982) or similar credible suitability index A potential sampling scheme may consist of randomly selecting four permanent transects (or equivalent plots) per habitat area. At 500 foot intervals along each transect characterize habitat for pileated woodpeckers. Along the transect route, the observer will also note feeding cavities, nest/roost cavities, and actual sightings Monitoring of spotted owl areas will include incidental gathering of pileated data since SOHAs also qualify as pileated woodpecker habitat Pileated areas will be sampled for pine marten habitat data. Record sightings and sign of other wildlife species noticed along the transects

2. Examine sites where natural occurrences such as windthrow or fire may have affected the sites. Examine affected habitat areas within a year after the event.

3. Examine 10 percent of habitat areas annually to sample for occupancy and productivity of pileated woodpecker. Use tape recorded territorial calls and drummings to elicit responses for pileated woodpeckers. Search areas for nests to determine productivity (see Mellen 1987 for methods).

Expected Precision and Reliability

Precision is considered moderate because credible models will be used to assess habitat capability. Reliability is considered moderate because all designated habitat areas will be monitored; conversely, actual territorial requirements on the Forest are not well understood.

Responsible Staff

Forest Resources Staff coordinates sampling methods, compilation of data and Forest report

Annual Monitoring Cost

Monitor 28 areas. Half the sites will be monitored in each of the first two years, 25 percent annually thereafter.

Initial area survey: Two people one day to monitor an area, one-fourth of areas for four years

28 areas x $120/day x 2 persons = $6,720
Equipment (track boards) = $1,120
SO/RD administration = $600
Total: $9,560 for two years, annual cost of $4,780

Annual survey of 25 percent: Two people one day per area.

7 areas x $120/day x 2 persons: $1,680
Equipment. $280
SO/RD administration: $300
Total· $2,260

Annual occupancy and productivity monitoring:

3 areas monitored each year. On the average it will take two people 5 days to monitor one area.

3 areas x $120/day x 2 people x 5 days = $3,600
SO/RD administration: $300
Total: $3,900

Year		Year	
1	$8,380	6	5,860
2	10,640	7	5,860
3	5,860	8	5,860
4	5,860	9	5,860
5	5,860	10	5,860

Total decade cost: $65,900

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$6,590
TOTAL	$6,590

Remarks

Research is needed in south-central Oregon to define the habitat parameters of three-toed woodpecker. In the meantime, literature review of current research will suffice to determine if habitat requirements in the plan are appropriate.

Monitoring Element: Wildlife - Northern Three-Toed Woodpecker

Monitoring Objective

Assure that habitat that will meet or exceed the Forest share of that needed to meet viable populations of northern three-toed woodpecker is provided and maintained.

Management Area

Management Area 7.

Monitoring Questions

1. *Are the number of areas identified in the plan being maintained?*
2. Are the areas meeting the definition of suitable habitat as specified in the Forest plan?
3. Are the areas occupied and productive?
4. Are the size, distribution, and definition of old growth adequate for pileated woodpecker use?

Threshold of Concern

1. Habitat suitability is less than minimum standards.
2. Decline of more than 15 percent in detected presence.
3. Habitat area numbers and distribution less than minimum requirements.
4. Decline of more than 20 percent in occupancy or reproduction success (nest failure).
5. More than 25 percent difference in size requirements, distributional requirements, or habitat definition criteria between current three-toed research and habitat as specified in the plan.

Suggested Sampling Methods

1. Monitoring question 1 and 2: Examine 50 or 25 percent of the habitat areas annually (depending on the year) to sample for maintenance of habitat effectiveness for three-toed woodpeckers (including both the 300 acres of designated old growth habitat and the 300 acres of foraging habitat). Establish permanent plots for sampling habitat capability; use credible suitability index. A potential sampling scheme may consist of randomly selecting four permanent transects (or equivalent plots) per habitat area. At 500 foot intervals along each transect characterize habitat for three-toed woodpeckers. Along the transect route, the observer will also note feeding cavities, nest/roost cavities, and actual sightings Monitoring of spotted owl areas will include incidental gathering of three-toed data since SOHAs also qualify as pileated woodpecker habitat. Three-toed areas will be sampled for pine marten habitat data. Record sightings and sign of other wildlife species noticed along the transects.

2. Examine sites where natural occurrences such as windthrow or fire may have affected the sites. Examine affected habitat areas within a year after the event.

3. Examine 10 percent of habitat areas annually to sample for occupancy and productivity of three-toed woodpecker. Search areas for nests to determine productivity.

Expected Precision and Reliability

Precision is considered moderate because credible models will be used to assess habitat capability. Reliability is considered moderate because all designated habitat areas will be monitored; conversely, actual territorial requirements on the Forest are not well understood.

Responsible Staff

Resources Staff coordinates sampling methods, compilation of data and Forest report.

Annual Monitoring Cost

Monitor 230 areas. Half the sites will be monitored in each of the first two years, 25 percent annually thereafter.

Initial area survey: Two people one day to monitor an area, one-fourth of areas for four years.

58 areas x $120/day x 2 persons = $13,920
Equipment (track boards) = $2,320
SO/RD administration = $600
Total $16,840 annually for four years, total over four years $67,360

Annual survey of 25 percent: Two people one day per area.

58 areas x $120/day x 2 persons: $13,920
Equipment: $2,320
SO/RD administration: $300
Total: $16,540

Annual occupancy and productivity monitoring:

23 areas monitored each year. On the average it will take two people 5 days to monitor one area.

23 areas x $120/day x 2 people x 5 days = $27,600
SO/RD administration: $300
Total: $27,900

Year		Year	
1	$16,840	6	44,140
2	60,980	7	44,140
3	60,980	8	44,140
4	60,980	9	44,140
5	44,140	10	44,140

Total decade cost: $464,620

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$46,500
TOTAL	$46,500

Remarks

Research is needed in south-central Oregon to define the habitat parameters of three-toed woodpecker. In the meantime, literature review of current research will suffice to determine if habitat requirements in the plan are appropriate.

Monitoring Element: Wildlife - Goshawk

Monitoring Objective

Assure that habitat that will meet or exceed the Forest share of that needed to meet viable populations of goshawk is provided and maintained.

Management Area

Management Area 7.

Monitoring Questions

1. Are the criteria used for the definition and selection of goshawk habitat adequate?
2. Are goshawk using the habitat retained to meet MRs?
3. Is goshawk an appropriate indicator species?

Threshold of Concern

Research or use studies indicate that habitat criteria used in the plan are inappropriate

Less than 75 percent of the areas selected used by goshawk over a five-year period

Research or use studies indicate that goshawk not an appropriate indicator.

Suggested Sampling Methods

1. Determine habitat parameters of goshawk nesting sites and general use areas. Measure physical parameters.
2. Monitor selected goshawk habitat areas (most overlap with pileated woodpecker and other species habitat areas) for use by goshawk. Monitor 25 percent of areas annually.

Expected Precision and Reliability

Precision of survey is expected to be low to moderate and reliability moderate

Responsible Staff

Forest staff will coordinate sampling methods, compilation of data, and Forest report

Annual Monitoring Cost

Most goshawk areas overlap with pileated woodpecker or other species. Only possible unique goshawk areas are considered here.

Initial Survey habitat: 3 sites x 2 persons x 1 day x $120 = $720.

Monitor areas and productivity: 3 sites x 2 persons x 5 day x $120 = $3,600 annually.

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$3,700
TOTAL	$3,700

Monitoring Element: Wildlife - Pine Marten

Monitoring Objective

Assure that habitat that will meet or exceed the Forest share of that needed to meet viable populations of pine marten is provided and maintained.

Management Area

All management areas.

Monitoring Questions

1. Is habitat located in reserved sites meeting the needs of pine marten in regard to structure, function, and size as per assumptions?

2. Is the distribution of pine marten habitat meeting species needs?

3. Are areas occupied by pine marten being isolated from genetic interchange by management activities?

Threshold of Concern

Monitoring question 1: More than 10 percent of marten habitat sites have less than 95 percent suitable habitat.

Monitoring question 1, 2, and 3: More than 10 percent reduction in the distributional area of pine marten after five years of baseline information is developed.

Suggested Sampling Methods

1. Field survey 10 percent sites annually without duplication.

2 Cooperate with research to determine marten habitat needs and validate Forest Plan assumptions as to habitat requirements.

3. Conduct annual winter track intercept and summer track plate surveys or use other appropriate techniques to evaluate use of habitat and overall distribution of pine marten.

Expected Precision and Reliability

Precision should be high, reliability low to moderate.

Responsible Staff

Forest Resources Staff will coordinate sampling methods, compilation of data, and Forest reports.

Annual Monitoring Cost

Site monitoring: 70 sites. $300/day, 1 site/day, 7 sites = $2,100.
Distribution monitoring (track counts, etc.): 20 transects in habitat. Initial cost $500/transect = $10,000. Annual cost after transects established $6,000 annually

Year		Year	
1	$18,100	6	$8,100
2	8,100	7	8,100
3	8,100	8	8,100
4	8,100	9	8,100
5	8,100	10	8,100

Total decade cost: $91,000.

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$9,100
TOTAL	$9,100

Remarks

Research is needed to determine whether or not there are isolated pine marten populations on the Forest and to determine if genetic interchange is occurring if there are isolated populations.

Cooperative funding for research to determine if genetic isolation is occurring. Two years at $30,000/yr = $60,000.

Monitoring Element: Sensitive Species (Other Than Previously Listed)

Monitoring Objective

Assure that sufficient habitat is maintained or enhanced on the Forest for plants, birds, mammals, fish, reptiles and amphibians, and invertebrates listed for the Forest on the Regional Forester's Sensitive Species List so that management will prevent the sensitive species from becoming candidate species for the Federal Threatened and Endangered Species List.

Management Area

All management areas

Monitoring Questions

1. Are sensitive animal and plant species density and distribution being maintained or increased on the Forest?

2. Are habitat improvements for sensitive animals and plants effective?

Threshold of Concern

Disturbance of sensitive species habitat outside of recommended practices or improvement projects.

A decrease of greater than 10 percent below existing sensitive plant or animal density on the Forest

Suggested Sampling Methods

1 Annual survey of known sensitive species locations for two consecutive years out of every five years.

Expected Precision and Reliability

Precision and reliability of survey is moderate

Responsible Staff

Resources Staff will coordinate sampling methods, compilation of data, and Forest report.

Annual Monitoring Cost

Animal surveys: $20,000 per year of survey. This is not the cost of surveys needed for project activity documentation (timber sales and grazing permits, for example). Costs for project surveys will be borne as support for the project.

Fifth year report: $3,000

Year		Year	
1	$23,000	6	$23,000
2	23,000	7	23,000
3	3,000	8	3,000
4	3,000	9	3,000
5	*6,000*	*10*	*6,000*

Total decade cost: $116,000.

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$11,600
TOTAL	$11,600

Remarks

Further studies to determine distribution of sensitive plant and animal species will be needed.

Monitoring Element: Plant and Animal Diversity

Monitoring Objective

Assure that all native and desirable introduced or historic plant and animal species and communities, and all seral stages of terrestrial, aquatic, and edaphic plant associations are provided in a distribution and abundance to assure species diversity and viability.

Management Area

All management areas, forestwide. Future monitoring may be more local. Areas that support many rare species may have to be monitored and analyzed separately.

Monitoring Questions

1 What is the present distribution and proportion of seral stages by plant association?
   a. How do they compare to past distributions?
   b. What distribution and proportion is expected in the future?
   c. What are the trends?

2. What are the trends in overall species diversity on the Forest?
a. Are there trends in species richness?
b. Are there relationships to management practices and direction?
c. Are there relationships with natural processes or events?

Threshold of Concern

Any decrease in the number of plant communities or animal species is a matter of concern. Thresholds and requirements of individual species (such as fish, woodpeckers, spotted owl) have been established and will be monitored.

Suggested Sampling Methods

1. Use the resource inventory to determine plant association and seral stage and assess the presence/absence of selected common wildlife species.

2 Continue to use RESURV, stake tree plots, stand exams, silvicultural visits, unit exams, and ecoplots to map plant associations and existing seral stages. These exams are ongoing and used to update data bases. With the installation of GIS the process will be streamlined and can be efficiently used to display the distribution of seral stages.

3 Sensitive plant surveys will be used to evaluate population abundance and trends in density

4. Information combined from the above sources on species abundance and distribution will be used to evaluate the trends in species richness and evenness.

5 Records will be kept in GIS to compare trends at least every five years.

Expected Precision and Reliability

At least two cycles of monitoring will be necessary to evaluate the process The first cycle will determine whether particular measures are adequate measures of habitat and species diversity. The second cycle will help to establish appropriate comparative processes for evaluating trends.

Responsible Staff

Forest Resource Staff will coordinate the process

Annual Monitoring Cost

Map plant associations and seral stages: $10,000

Sensitive plant surveys will be conducted on a project basis and charged to that project (timber sales, grazing permits, road construction, etc.). Compilation of data for monitoring purposes. $5,000.

Trend evaluation: $3,000.

Record keeping: $3,000

Year		Year	
1	$10,000	6	$11,000
2	11,000	7	11,000
3	11,000	8	11,000
4	11,000	9	11,000
5	11,000	10	11,000

Total decade cost: $109,000

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$10,900
TOTAL	$10,900

Remarks

Species/habitat relationships have not been established for many species on the Forest. Research support is needed to develop these relationships

Continued long-term monitoring will be necessary to establish critical relationships and thresholds for the abundance of the various seral stages, their distribution, and specific species requirements for.

Monitoring Element: Old Growth (General)

Monitoring Objective

Assure that the old growth reserved as old growth meets Forest Plan objectives.

Management Area

Management Areas 1, 4, 5, 6, 7, 9A, 9C, 13, 14.

Monitoring Questions

1. Are predictions of existing old-growth acreage accurate?
2. How much old growth remains (in case preserved old growth is destroyed)?
3. Does the old growth that is retained meet public expectations regarding definition, location, and size?

Threshold of Concern

More that 10 percent difference between assumed acreage and actual acreage at the end of five years.

Suggested Sampling Methods

1. Field inventory to determine baseline acres of ecologically significant old growth on the Forest by the end of the second year of implementation.
2. Annually determine old-growth acres remaining in noted Management Areas.
3. Field review old-growth retention practices every three years.

Expected Precision and Reliability

Precision of definition moderate, reliability moderate to high. Acreage precision after baseline acres defined is moderate to high, reliability moderate to high.

Responsible Staff

Forest Resource Staff

Annual Monitoring Cost

Initial inventory will be completed in the fall of 1990.

Annual activity monitoring:

1 day/RD x $120 = $360
2 day SO x $150 = 300
Total $660

Field review: $3,000 every three years.

Year		Year	
1	$3,660	6	$660
2	660	7	3,660
3	660	8	660
4	3,660	9	660
5	660	10	3,660

Total decade cost: $18,600.

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$1,860
TOTAL	$1,860

Monitoring Element: Range (Vegetation)

Monitoring Objective

Assure that satisfactory range condition is in an upward trend in all allotments and particularly in riparian areas.

Management Area

All, except MA 2, MA 6, MA 13, and some intensities of MA 4

Monitoring Questions

1. Is range vegetation condition being maintained or improved in stable or upward trend?
2. Are areas in unsatisfactory condition or where basic resource damage has occurred improving?
3. Are riparian area objectives for vegetation condition being met?
4 Is the area of noxious weed infestations stable or decreasing?

Threshold of Concern

Monitoring question 1 and 2. Greater than ten percent of any allotment area outside riparian areas exhibits downward trend of site integrity or forage quality for more than two consecutive years.

Monitoring question 3: Any riparian area shows downward trend for more than two consecutive years.

Monitoring question 1, 2 and 3 Range vegetation utilization is 10 percent or greater that that which is authorized for more than two consecutive years

Monitoring question 4: Area of noxious weed infestation is increasing at rate of greater than 5 percent in five years.

Suggested Sampling Methods

1 Reestablish and establish permanent condition and trend transects in key areas (particularly riparian areas) of all allotments, read one-third of the transects on each allotment annually.

2 Establish forage production and utilization studies, monitor annually

3. Field review Oregon Department of Agriculture and Klamath County acre estimates of noxious weed infestation annually.

Expected Precision and Reliability

The precision of range vegetation data is moderate to high, reliability is moderate. The precision of noxious weed acres is low to moderate, reliability is low to moderate. The precision of and reliability of field review is moderate.

Responsible Staff

Forest Resource Staff coordinates sampling methods, compilation of data, and Forest reports.

Annual Monitoring Cost

Condition and trend: initial cost, $60,000 over 3 years; annual cost, $20,000.

Utilization monitoring: initial cost, $10,000 over 2 years; annual cost: $5,500.

Noxious weed review: Annual cost: $ 1,500.

Program review: Annual cost: $ 1,500.

Year		Year	
1	$28,00	6	$28,500
2	53,500	7	28,500
3	48,500	8	28,500
4	28,500	9	28,500
5	28,500	10	28,500

Total decade cost: $329,000

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$32,900
TOTAL	$32,900

Monitoring Element: Timberland Suitability

Monitoring Objective

Validate and increase the resolution of the timberland suitability assessment for the Forest. Determine if lands identified as unsuitable for timber production have become suitable (36 CFR 219.12(k)(5)(ii)). Ensure that timber harvest is not occurring on unsuitable lands to meet the allowable sale quantity.

Management Area

All management areas

Monitoring Questions

1. Is the timberland suitability assessment correct for all forested acres?
2. Are unsuitable acres being harvested to achieve the allowable sale quantity?

Threshold of Concern

Any timber harvest occurring on unsuitable timberland unless the harvest is necessary to meet some other resource objective

The suitable land base changes more than 30,000 acres.

Suggested Sampling Methods

Timberland suitability will be reviewed and updated as needed as a part of project level planning. All changes in timberland suitability will be documented and coordinated with S.O. specialists. The accumulative changes can be summarized yearly.

Expected Precision and Reliability

Data collection and compilation are expected to have low precision, and the reliability of data is expected to be low.

Responsible Staff

Timber Staff

Annual Monitoring Cost

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$10,000
ADDED	$0
TOTAL	$10,000

Monitoring Element: Timber Inventory

Monitoring Objective

Verify the current inventory of green lodgepole pine sawtimber. Also verify the inventory of green mixed conifer sawtimber.

Management Area

Management areas 3, 8, 9B, 10, 12, and 15.

Monitoring Questions

1. Is there sufficient mixed conifer volume available to produce the planned ASQ in that working group?

2. Is the lodgepole pine continuing to die at a rate that can support the planned salvage programmed?

3 If the mountain pine beetle epidemic subsides, should the lodgepole pine ASQ be recalculated?

Threshold of Concern

The planned or projected inventory of either the mature lodgepole pine working group or the mature mixed conifer working group varies by more than 25 percent of the revised inventory.

Suggested Sampling Methods

The scheduled reinventory of the Forest.

Expected Precision and Reliability

Data collection and compilation are expected to have high precision, and the reliability of data is expected to be moderate.

Responsible Staff

Timber Staff

Annual Monitoring Cost

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$10,000
ADDED	$0
TOTAL	$10,000

Monitoring Element: Timber Harvest Unit Size

Monitoring Objective

Verify that timber harvest units meet the standards and guidelines for size and dispersion. Determine whether maximum size limits for harvest areas should be continued (36 CFR 219.12(k)(5)(iv)).

Management Area

All management areas

Monitoring Questions

1. Did any of the harvest units exceed the size or dispersion limitations in the standards and guidelines?

2. Were exceptions to the standards and guidelines properly documented and reviewed?

3. Are unit size restrictions needed to achieve other resource coordination requirements?

Threshold of Concern

Any harvest unit which creates an opening larger than 40 acres.

Suggested Sampling Methods

Annual review of the STARS data base and project level environmental assessment documentation.

Expected Precision and Reliability

Data collection and compilation are expected to have high precision, and the reliability of data is expected to be high.

Responsible Staff

Timber Staff

Annual Monitoring Cost

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$2,000
ADDED	$0
TOTAL	$2,000

Monitoring Element: Regeneration Success

Monitoring Objective

Verify that all regeneration cutting units and other deforested acres are reforested in a timely manner. Verify that all regeneration units are reforested within the time period specified in 36 CFR 219.7 (c) (3)

Management Area

All management areas

Monitoring Questions

1. Are all even-aged regeneration harvest units reforested within 5 years of clearcutting or within 5 years of the final removal cut for all seed tree and shelterwood treatments?

2. Are all uneven-aged harvest units reforested within 5 years if the treatment reduces the residual stocking below minimum levels?

Threshold of Concern

Anytime a reforestation unit, either even-aged or uneven-aged management, is not reforested within 5 years.

Anytime first year planting success is below 80 percent.

Anytime third year planting success is below 70 percent.

Suggested Sampling Methods

First, third, and fifth year regeneration stocking surveys

Expected Precision and Reliability

Data collection and compilation are expected to have moderate precision, and the reliability of data is expected to be high

Responsible Staff

Timber Staff

Annual Monitoring Cost

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$80,000
ADDED	$0
TOTAL	$80,000

Monitoring Element: Insects and Disease

Monitoring Objective

Determine the level of pest activities on the Forest so that programs can be modified as necessary to prevent unplanned losses.

Management Area

All management areas.

Monitoring Questions

1. Is animal damage from deer, pocket gophers, and porcupines causing plantation failures?
2. Is dwarf mistletoe damage increasing?
3. Is rot root damage increasing?
4. Are defoliating insects causing unexpected growth loss?
5. Are bark beetles causing unexpected mortality?

Threshold of Concern

Anytime a forest pest reduces plantation stocking levels within 25 percent of minimum stocking levels. Loss of growth or mortality in excess of 10 percent above normal losses.

Suggested Sampling Methods

Annual insect and disease surveys, field reviews, and biological evaluations.

Expected Precision and Reliability

Data collection and compilation are expected to have low precision, and the reliability of data is expected to be moderate.

Responsible Staff

Timber Staff

Annual Monitoring Cost

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$10,000
ADDED	$0
TOTAL	$10,000

Monitoring Element - Soil

Monitoring Objective

Assure that soil productivity (chemical, biological, and physical soil properties) is maintained at levels capable of supporting the forest resources.

Management Area

All management areas.

Monitoring Questions

1. Are soil physical properties being maintained following timber harvest and site preparation?
2. Is erosion, displacement, or compaction occurring?
3. Are soil and site organic matter and nutrient levels being maintained during and following management activities and forest use?
4. Is growth of trees being maintained at satisfactory rates?

Threshold of Concern

1. Compaction, displacement, puddling, or severely burned conditions exceed 20 percent *of the activity area, including roads, skid trails, and landings.*
2. Organic residues and biological and chemical properties are detrimentally altered by timber harvest and site preparation, resulting in reduced soil productivity.
3. *Tree growth is less than acceptable levels.*

Suggested Sampling Methods

1. Visual surveillance and instrumentation monitoring to determine extent of compacted, *displaced, and severely burned soil.*
2. Visual surveillance to determine residue cover for soil erosion protection and nutrient carryover.
3. *Cumulative soil condition survey.*
4. Methods to be developed by PNW Experiment Station for monitoring the effects of organic residues on soil biological and chemical properties will be utilized.
5. *For monitoring of tree growth, refer to "Monitoring Element: Timber - Growth Response* to Silvicultural Treatment."

Expected Precision and Reliability

Monitoring the physical and chemical properties has low precision and accuracy, and would be moderately reliable Determining the implications of changed soil/site properties on seedling

and tree growth has less precision and accuracy, and as a result would be reliable in the long term but less reliable in the short term.

Responsible Staff

Forest Resources Staff

Annual Monitoring Cost

$25,000 annually for first two years to establish monitoring sites and to make initial measurements. $20,000 annually to collect, analyze, and report results. $3,000 surveillance (visual) yearly. Total $48,000 first 2 years; $23,000 per year thereafter.

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$13,000
ADDED	$15,000
TOTAL	$28,000

Monitoring Element: Riparian Area Cumulative Effects

Monitoring Objective

Determine whether the unique and valuable characteristics of riparian areas, including water quality, wildlife habitat and fish habitat near or within riparian ecosystems, are being maintained or improved.

Management Area

All Management Areas

Monitoring Questions

1 Is long-term riparian and channel health being maintained, or if not in good condition, being improved; and is channel structure and function adequate to safely pass peak flows, maintain late season base flows, and provide fish habitat?

2. Are riparian areas providing for quantity, quality, and diversity of riparian plan communities and wildlife habitat?

3. Are riparian areas and streams correctly identified in Forest records?

Threshold of Concern

1 Decrease in structure and function of channels and floodplains.
2. Decrease in quantity, quality, and diversity of riparian plant communities and wildlife habitat
3. Riparian areas and streams not correctly identified

Suggested Sampling Methods

1 Permanently installed terrestrial, biological, and stream channel transects and photo point documentation. Approximately 15 to 20 representative locations. Each location will be measured once every 4 years and will be tracked over duration of many decades.

2. Field check a representative sampling of riparian areas affected by project work before and after projects
   a. Post-project sampling soon after project completion
   b. Post-project sampling 2 to 5 years after project completion

3. Riparian area survey.

4. Also see monitoring elements for Fish Habitat, Water, Wildlife, Range, and Diversity.

Expected Precision and Reliability

1. Precision moderate. Reliability low due to small sample size
2. Precision moderate. Reliability moderate.
3 Precision moderate. Reliability moderate.

Responsible Staff

Forest Resource Staff Officer

Annual Monitoring Cost

Photo points and surveys: First year initial cost $24,000; Annual recurring cost $ 6,000. Field sampling project work. Annual recurring cost $5,000 Riparian survey: Annual recurring cost $25,000

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$38,000
TOTAL	$38,000

Monitoring Element: Water

Monitoring Objective

1. Determine Best Management Practice (BMP) Implementation and Effectiveness

2. Determine whether water quality is maintained or improved and associated beneficial uses of water are adequately protected.

3. Determine whether stream channel stability of favorable conditions of stream flow is maintained.

4. Determine compliance with State requirements in accordance with the Clean Water Act for protection of the waters of the State of Oregon, including the antidegradation policy for high quality waters and wild and scenic rivers.

Management Area

All management areas.

Monitoring Questions

1. Are water resource-related BMPs being properly identified, implemented, and documented?

2. Are water resource-related BMPs effective for:
   a. Maintaining or enhancing water quality and the beneficial uses of water?
   b Maintaining stream channel stability and favorable conditions of flow?
   c. Allowing compliance with State water quality requirements such as Oregon antidegradation policy for high quality waters and National Wild and Scenic Rivers?

Threshold of Concern

1. Fewer than 90 percent of BMPs required in standards and guidelines and prescriptions are included in environmental assessments, contracts, and project plans Fewer than 90 percent of planned BMPs are being implemented in activities.
2 Water quality and channel condition are insufficient to maintain existing beneficial uses of water.

Suggested Sampling Methods

1. **Monitoring Question 1 (BMP Implementation):**

   The field implementation of site-specific BMPs will be monitored to some extent for each project. A "Best Management Practice Checklist" will be developed for each activity unit (from "General Water Quality Best Management Practices," USFS Region 6, November 1988). BMP items included in environmental analyses, contracts, and project plans will be recorded on the BMP checklist. Completion of each BMP will be recorded on BMP checklist for each activity unit. Where BMPs are not implemented or are ineffective, mitigation measures will be planned, implemented, and monitored. Information will be documented

in a check list and/or narrative format and stored in the project records. Results will be analyzed to assess compliance with the Forest Plan

2 **Monitoring Question 2 (BMP Effectiveness):**

a. Visual Observations and Measurements:
Periodic visual observations of activities will be used as the initial method of measuring the effectiveness of site-specific BMPs. Observations will be made for evidence of erosion, sedimentation, changes in channel condition and function, and other changes in water quality.

b Water Quality Sampling.
1) Water Temperature:
Maximum/minimum thermometers will be placed at 4 to 10 selected stream locations per District. Automated temperature data-loggers will be installed at 18 to 20 sites on the Forest.
2) Turbidity Surveillance Monitoring:
Discrete grab samples will be taken at selected project sites on each District. Three sites will be sampled for each District in any one year. Sampling will generally be taken "above" and "below" the selected activity.
3) Automated Turbidity Sampling:
Automated turbidity samplers will be used to measure baseline turbidity, stream turbidity "above" and "below" timber harvest and/or "above" and "below" Forest land. up to three locations on the Sycan River and up to 6 locations on other Forest streams and rivers

c. Beneficial Uses Monitoring.
Fish habitat and population monitoring is discussed under Fish Habitat Monitoring. Fish habitat monitoring will also reveal water quality and channel conditions that may be of concern for other beneficial uses.

d Watershed Cumulative Effects Monitoring:
1) Data Summary: The following types of data will be accumulated annually and summarized on a watershed basis: timber harvest acres, range AUMs, road construction and abandonment miles, prescribed burning acres, wildfire acres, and watershed improvement acres.
2) Cumulative effects assessment. Watershed data summaries will be considered with off-Forest summaries and will be used to make cumulative effects evaluations during project environmental assessment
3) Photo Point Monitoring: Monumented photo-points will be established at 20 selected sites to monitor changes in stream morphology. Photo-points will be accompanied with measured and documented physical and biological characteristics of the stream channel and riparian area.

Expected Precision and Reliability

Precision and reliability of monitoring BMP implementation are expected to be good. Precision and reliability of determining water quality status is expected to be moderate. We expect the monitoring information to be adequate to document and verify implementation and effectiveness of the BMPs, as well as provide a basis for modifying practices if necessary.

Responsible Staff

Resource Staff Officer

Annual Monitoring Cost

Monitoring Item	First Year Initial Costs	Annual Recurring Costs
BMP Implementation	17,000	14,000
BMP Effectiveness		
Visual Observations and Measurements	9,000	7,000
Water Temperature	25,000	5,000
Turbidity Surveillance Monitoring	12,000	9,000
Automated Turbidity Sampling	18,000	5,000
Watershed Cumulative Effects	8,000	5,000
Photo Point Monitoring	10,000	1,000
Soil Surface Cover (See Monitoring Element, Soil)		
Beneficial Uses (See Monitoring Element Fish Habitat)		
Totals	$99,000	$48,000

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$0
ADDED	$51,300
TOTAL	$51,300

Monitoring Element: Transportation System

Monitoring Objective

To ensure that the Transportation system is serving the needs of the public and is providing adequate access for accomplishment of the Forest Plan Goals and Objectives.

Management Area

All Management Areas except Management Area 6 - Wilderness

Monitoring Questions

1 Are the types and miles of road access (Passenger car, High Clearance, and Intermittent Access) meeting the needs for public and administrative access?

2. Is the Transportation system being managed and maintained to meet Forest Plan Goals and Objectives?

Threshold of Concern

1. The miles of Passenger car, High Clearance, and Intermittent road access are within + or - 10 percent of the Forest Plan Levels, or public concerns have indicated that adequate road access is not being provided to meet public needs.

2. Program Reviews have indicated that road access on the Forest is not adequate for accomplish of the Forest Plan Goals and Objectives.

Suggested Sampling Methods

1. Annual update and review of data, evaluation of public concerns or input received, results of environmental analysis, and program reviews.

Expected Precision and Reliability

Precision and reliability will be moderate to high.

Responsible Staff

Forest Engineer

Annual Monitoring Cost

Average Annual Cost Summary

TYPE	AMOUNT
BASE ADDED	$2,000 $0
TOTAL	$2,000

Monitoring Element: Social and Economic Setting

Monitoring Objective

Consider the effects of National Forest Management on communities adjacent to or near the Winema National Forest.

Management Area

Forestwide.

Monitoring Questions

1. Is the total Forest program similar in job and income impacts to the Forest Plan estimates?

2 Is the socioeconomic structure of the local area changing in a way which could lead to conflicts between the community and the Forest or to problems related to Forest management issues?

3 Are National Forest returns to the county lower than historic levels and adversely affecting County government?

Threshold of Concern

1. Annual "total job" estimate of less than 1,800 jobs or "total income" less than $50 million (1982 dollars).

2. Identifiable community problems that can be linked to changes in Forest Service programs.

3. Annual 25 percent fund disbursements to the State (for redistribution to the County) less than $7,920,000 (1985 through 1989 average expressed in 1982 dollars) or a 10 percent decline from the previous year.

4. See table, below, for additional thresholds.

Suggested Sampling Methods

1 Develop an estimate of total jobs and income associated with the actual Forest program each year using the same process as used in developing the Forest Plan estimates. This involves updating the estimates of actual use levels and recalculating the total jobs and total income using IMPLAN job and income coefficients. Document key differences in outputs which adversely affect jobs and income.

2 Collect data on key socioeconomic indicators as shown in the following table:

ITEM	THRESHOLD OF CONCERN	METHODS	UNITS OF MEASURE	PRECISION/ RELIABILITY	COST BASE/ADDED
Changes in local income	15% variation over 3 years	U S Census, State publications, County & local agency reports, etc	1982 dollars	High/High	$100/$0
Changes in local population	15% variation over 3 years	U S Census, State publications, County & local agency reports, etc	Number of people	Mod/High	$100/$0
Changes in local employment patterns	15% variation over 3 years	U S Census, State publications, County & local agency reports, etc	persons by industry of occupation	Mod/High	$100/$0
Changes in payments to Counties	Payments < $7 92 MM (1982 $) or 10% decrease from previous year	Annual review of 25% fund disbursement reports	1982 dollars	High/High	$100/$0
Changes in lifestyles, attitudes, beliefs or values	Established trend toward Forest/ community conflict or identified problems	Interviews with key publics and opinion leaders in communities, observation, etc (FSH 1909 17)	Subjective	Low/Low	$2500/$0
Changes in Forest contribution to area forest products industries	Shifts which threaten the local economy	Annually track raw material flow to mills - review and summarize form FS-2400-46	MBF by mill location (city)	High/High	$1000/$0

3 Develop a subjective analysis of the current socioeconomic situation and associated trends based upon the above data. Cooperate with the Economist at the State Division of Employment in this analysis.

Expected Precision and Reliability

Precision and reliability should be moderate.

Responsible Staff

Planning Staff

Annual Monitoring Cost

Average Annual Cost Summary

TYPE	AMOUNT
BASE	$3,900
ADDED	$0
TOTAL	$3,900

(Excludes costs associated with estimating various Forest outputs which are used to estimate employment and income effects)