

CHAPTER V



Rocky Rockwell

Monitoring and Evaluation

CHAPTER V. Monitoring and Evaluation

Forest planning is a dynamic process that does not end with publication of the Plan. Monitoring and evaluation activities provide information to help determine whether or not Inyo National Forest programs are meeting the Plan's objectives. It is through this process that corrections and adjustments are made in management activities, the degree of implementation is assessed, and the need for change is determined.

Monitoring and evaluation are separate, sequential activities. Monitoring consists of collecting information from selected sources to measure the effects of Forest Service activities. This information will indicate whether programs are consistent with the objectives and costs projected in the Plan and whether they are adhering to the Plan's Standards and Guidelines and responding to the public's and management's expressed concerns.

In the evaluation stage, information obtained in monitoring is compared with Plan requirements. When differences are noted, their significance will be evaluated. The Plan can be amended at any time if monitoring results indicate that it is needed. An amendment would require an environmental analysis to determine whether the amendment represents a significant change from the Plan. If the proposed change from the Plan is significant, preparation of an Environmental Impact Statement and formal public involvement are required. If not, the kind of public involvement and the decision documentation that is needed will be determined by the type and magnitude of the proposed change.

The purpose of the Monitoring Plan is to assess the success of Plan implementation and determine whether the Plan needs to be amended or whether management activities need to be revised.

Monitoring Process

Results of monitoring and evaluation will be reported periodically as displayed in the Monitoring Plan Tables. Data sources for the monitoring plan include:

1. Management Reviews. General Management Review, Program Review and Activity Review.
2. Ongoing Inventories and Monitoring Programs. Soil productivity monitoring, water quality monitoring, forest inventory plots for timber, range utilization inventories, threatened and endangered species monitoring, etc.
3. Management Attainment Reports. Target accomplishment reports filed by Forest Supervisor's Staff and District Rangers three times per year and forwarded to the Regional Forester.

The Monitoring Plan is designed to monitor implementation of the Plan. It is not intended to replace ongoing detailed, resource specific monitoring. Results of the detailed current monitoring efforts will also be used to evaluate Plan implementation.

Monitoring will be performed by appropriate individuals throughout the Forest as follows:

1. Forest Staff. Each Staff Officer is responsible for preparing a more detailed resource monitoring plan for his/her respective function, with assistance from the District Rangers; providing technical advice and support in implementing the Monitoring Plan; periodically reviewing activities to ensure implementation of monitoring plans; and assembling the monitoring results at the close of each Fiscal Year.
2. District Rangers. Each District Ranger is responsible for assisting the Forest Staff Officers in preparing more detailed monitoring plans for each resource; monitoring the annual work plans of resource specialists reporting to him/her; ensuring that monitoring is carried out according to the plans, and submitting the results of monitoring to the appropriate Staff Officer.
3. Land Management Planning Staff Officer. At the close of each Fiscal Year, the Land Management Planning Staff Officer will incorporate all monitoring information, evaluate the results with the Forest Staff, and formally report findings and recommendations to the Forest Supervisor.

Evaluation Process

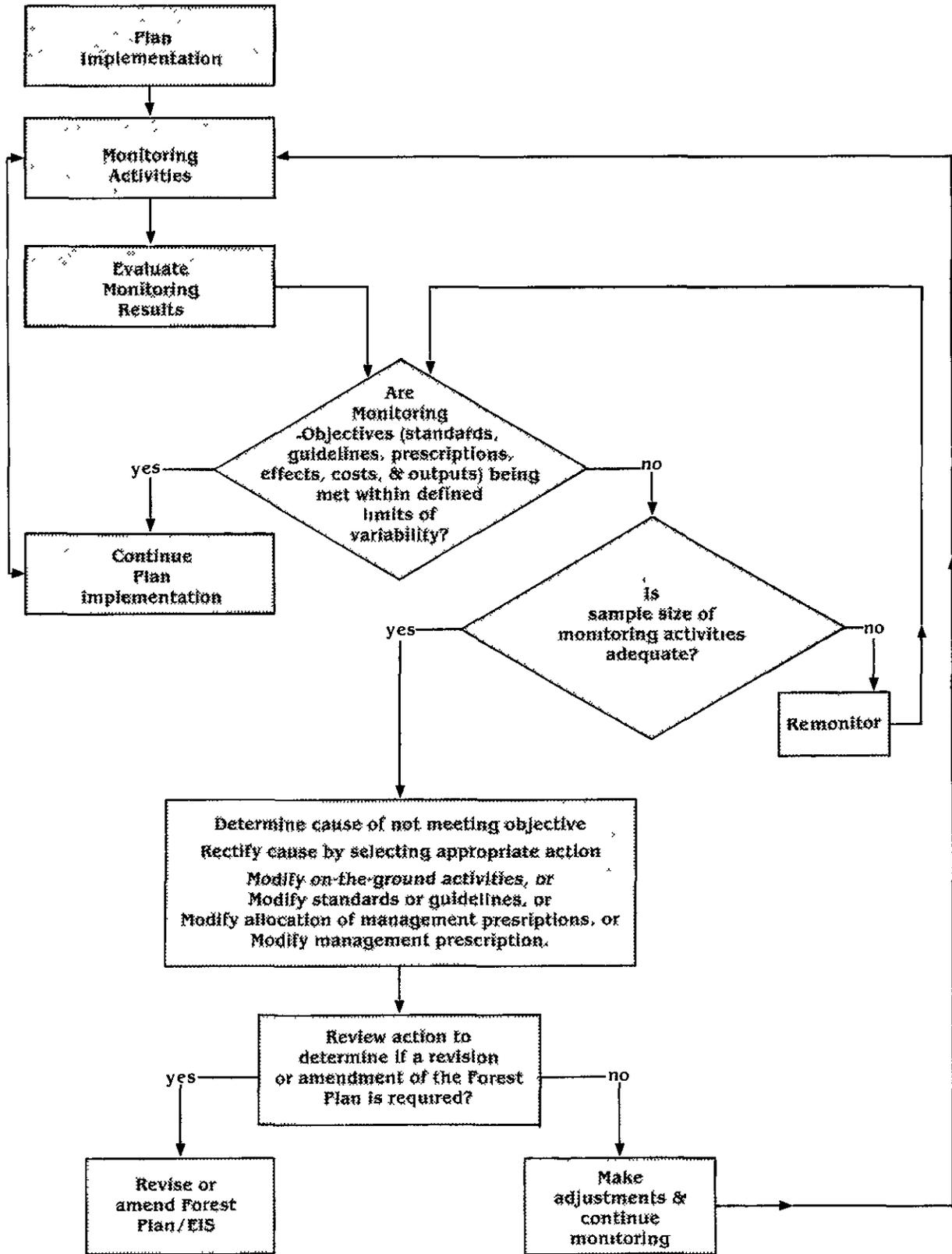
The Monitoring Evaluation Process displayed on the next page illustrates the steps necessary for an effective monitoring and evaluation plan. Based on the results of this process, need for further action is recommended to the Regional Forester.

Evaluation of the results of the site-specific monitoring program will be documented and available for public review. The significance of the results of the monitoring program will be analyzed by the Forest Supervisor. Based on the evaluation, there may be a need for further action. Management actions as a result of the monitoring and evaluation process can include:

1. No action needed. Monitoring indicates Plan Goals, Objectives, and Forest-wide Standards and Guidelines are achieved.
2. Refer recommended action to the appropriate line officer for improvement of application of Standards and Guidelines, Prescriptions, or Management Area Direction.
3. Modify portions of the Plan as a Plan Amendment.
4. Modify Prescription boundaries as a Plan Amendment.
5. Revise the projected schedule of outputs.
6. Initiate revision of the Plan.

Plan modification and/or revision will be made in accordance with the National Environmental Policy Act and National Forest Management Act regulations. Resource activities, practices or effects to be monitored are displayed in this section.

Monitoring Evaluation Process



MONITORING PLAN BY RESOURCE

The following tables display how the management activities on the Forest will be monitored. This information will be used to evaluate Plan implementation. The tables contain the following columns:

1. Activity to be Measured.
2. Monitoring Objective.
3. Monitoring Technique. A description of how the data will be gathered.
4. Expected Precision and Validity. Precision is the exactness or accuracy of measurement techniques. Validity is the expected probability that information acquired through sampling will reflect actual conditions. Both precision and validity are quantitatively rated as either high, medium, or low according to whether the maximum measurement is within 10%, 33%, or 50% of the sample mean, respectively.
5. Frequency and Reporting Period. The minimum frequency for data gathering; the minimum period for reporting the data.
6. Standard of Comparison and Variation from the Standard Requiring Further Action. The anticipated result, level, or status of the action, effect, or resource to be monitored and the expected variation of observations in relation to the standard. When this limit is exceeded, the cause of the variation must be rectified or the monitoring process modified, as appropriate.
8. Average Annual Cost. The Forest's best estimate of the annual cost of monitoring. This cost is in addition to the annual appropriated functional costs. If the costs are shown as zero, they are included in the annual appropriated functional costs.

INYO NATIONAL FOREST PLAN IMPLEMENTATION MONITORING PROGRAM

Inyo National Forest Plan Implementation Monitoring Program

Activity to be Measured	Monitoring Objective	Monitoring Technique	Expected Precision/Validity	Frequency/Reporting Period	Standard of Comparison and Variation from Standard Requiring Further Action	Additional Annual Cost (*)
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APPLIES TO ALL RESOURCE ELEMENTS (Responsible Official Forest Supervisor)

Implementation of Management Direction and Management	Ensure compliance with Forest Plan direction	Sample project plan and Environmental Assessments for compliance	High	Ongoing/Annually	Any deviation from Plan direction	\$14,500
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(Responsible Official Land Management Planning Staff Officer)

Cost and Benefits of Implementing the Forest Plan	Validate predicted versus actual Plan Implementation costs	Analyze expenditure and allocation	High	Annually/5 years	10% difference between predicted and actual costs of Implementing the Forest Plan	U (**)
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	Determine the economic effects of Plan Implementation	Review cost/benefit comparisons in project records	Medium	5 years/5 years	33% variation from benefit/cost ratios predicted in Forest Plan	U (**)
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Resource Output attainment	Compare actual vs predicted outputs	Attainment reports	High	Annually/Annually	10% deviation from predicted outputs over a five year period	U (**)
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AIR QUALITY (Responsible Official Watershed Staff Officer)

Air Quality	Evaluate compliance with State and Federal Air Quality standards in designated Class I and Class II airsheds	Monitor AQRV indicators by photography, measurement, analysis, and recordation	Varies with Technique	Continuous Monitoring/5 years	California Air Resources Control Board standards Any deviation from designated federal and state standards	\$ 5,000
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CULTURAL RESOURCES (Responsible Official Recreation Staff Officer)

Mitigation and protective measures	Assess effectiveness of protective measures taken to achieve "no effect" status on cultural resources from land use projects and other resource management activities	On-site inspection photography, measurement, and recordation	Medium	Annually/5 years	Protective measures are effective on less than 90% of sites samples per year	\$ 3,000
	Assess target to complete a total Cultural Resource Inventory's by the year 2030	Monitor status of inventory	High	Annually/Annually	10% deviation from target to inventory 40,000 acres per year	\$ 500
	Determine the occurrence and extent of vandalism effectiveness of cultural resources public awareness, interpretation, and enforcement programs	Signing sites, periodic on-site inspection, photography, measurement, and recordation	High High/Medium	Annually, or in response to reports of damage/annually.	Standard is the pre-vandalized condition, as shown on site survey records or other documents	\$ 6,000

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DIVERSITY

(Responsible Official Wildlife Staff Officer)

Vegetative Diversity

Ensure that the Forest-wide distribution of all successional stages meet Forest Service Guidelines & Prescriptions, that spatial and structural diversity is maintained in riparian areas, and that the prescribed quantity, quality and distribution of snags and down woody material is maintained

Compare existing and longterm minimum levels Sample range, recreation, timber and prescribed burn projects to determine the cumulative effects on successional stage, spatial and diversity

Low

5 years/
10 years

20% change in the expected acreage of successional stages of major vegetation types as a result of forest management activities

\$ 6,000

FISH

(Responsible Official Wildlife Staff Officer)

Threatened and Endangered Fish

Ensure compliance with recovery plan Forest-wide Standards and Guidelines

GAWS inventory of existing and potential habitats Population inventories coordinate with California Fish and Game for existing and re-introduced populations

Medium/High

3 years/
3 years
Project EAs, EISs, and reports

Existing population censuses, recovery plan criteria

\$ 4,000

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Inyo National Forest Plan Implementation Monitoring Program

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<u>FISH (CON'T)</u>						
(Responsible Official		Wildlife Staff Officer)				
Trout Streams	Monitor habitat condition of resident trout. Ensure that the integrity and productivity of trout streams are maintained or enhanced through the protection of such trout habitat factors as streambanks stability, bank and stream cover, riparian vegetation, and channel bottom composition.	Conduct stream surveys in cooperation with CDSG where possible. Sample project EAs and conduct field project reviews.	Medium	Project by project basis. Annually, with 5 year trend evaluation.	Activities that cause deviation from Forest Service Guidelines require an environmental analysis.	\$13,000
<u>PEST MANAGEMENT</u>						
(Responsible Official		Forest Integrated Pest Management Coordinator, State and Private Forestry, and Forest Pest Management)				
Damage and Populations	Early detection and evaluation of pest related problems on commercial timber lands and other Forest lands.	Aerial and ground surveys, surveillance, timber stands examinations and other resource-specific examinations.	Medium	Annually/As needed	Pest related damage levels must not interfere with the attainment of Management Goals and Objectives.	U (*)

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PROTECTION						
	(Responsible Official	Fire Management Staff Officer)				
Fire Suppression	Validate predictions of acres burned by wild-fire for next Forest Plan update	From fire report compare actual acres burned with predictive tables	High	5 years/ 10 years	Variation - 50% between actual and predicted acres burned within a Management Area	U (*)
RANGE						
	(Responsible Official	Range Staff Officer)				
Range Utilization	Ensure proper level of forage utilization in riparian areas and meadows and others AOP compliance	Conduct sample field surveys	Medium	Annually/ 5 years	15% deviation from standards as expressed in allotment management plans or Range Management Handbook	\$56,000
Range Forage Improvement	Determine effectiveness of browse release projects	Conduct field surveys following browse release projects	Medium	Annually/ 5 years	50% deviation from predicted results	\$ 500 per project
Range Condition and Trend	Determine the effects of grazing levels on the range resource Update AMPs as per Manual and Plan	Permanent and paced transects	Medium	5 years/ 5 years	Downward trend in soils or vegetation on range allotments	\$38,000
Wild Horse and Burro	Determine effectiveness of wild horse management	Monitor wild horse numbers & sex ratios and vegetative condition of habitat	High	Annually/ 10 years	Downward trend in soils or vegetation Decline in wildlife or wild horse conditions	\$14,000

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RECREATION						
(Responsible Official Recreation Staff Officer)						
Recreation Use	Determine total recreation use check co-efficients by ROS class	RIM system and other sampling techniques	Medium	Annually/ 5 years	10% variation between actual and predicted RVDs by ROS class	\$ 7,000
OHV use on land and other Resources	Determine if adverse effects on natural resources are occurring or likely to occur	Photograph and/or field measurement	Medium	Annually/ 3 years	25% deviation from standard prescribed in the OHV monitoring plan	\$10,000
RIPARIAN						
(Responsible Official. Watershed Staff Officer)						
Protection and Diversity	Ensure that management prescriptions and Forest Service Guidelines adequately protect meadows and riparian areas and their associated values Ensure that spatial and structural vegetative diversity is maintained in riparian areas	Field surveys	Medium	5 years/ 10 years	Activities that cause deviation from Forest Service Guidelines require an environmental analysis	\$ 1,000
Protection and Mitigation	Determine whether mitigation measures for small hydro projects & geothermal development are sufficient & effective in maintaining riparian vegetation & other riparian dependent resources	Field review of applied mitigation measures	Medium	5 years/ 10 years	20% deviation from Forest Service Guidelines	\$ 5,000 Per Project

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SENSITIVE PLANTS						
(Responsible Official Wildlife Staff Officer)						
Sensitive Plant Species Habitat	Detect changes in key populations of each species and assess impacts on selected populations of occupied habitats Identify key populations that will be used for monitoring purposes	Population trend censuses, Baseline and past-project surveys for input into EAs Use applicable techniques identified in Interim or Species Management Guides	High/High	Annually/Annually for specific projects 3-5 Years/ 3-5 Years or according to Interim or Existing Management Guides	Forest Standards & Guidelines, Sensitive Plant Handbook/No new impacts to plant populations that do not have species management plan, unless recommended by the Forest Supervisor	\$12,000
TIMBER						
(Responsible Official Timber Management Officer)						
Reforestation	Determination of success of regeneration practices	Described in FSH 2470 Includes sampling of species, survival, planting stock and density	High	1st & 3rd growing season after reforestation and maintained until fully certified as established/5 years	Described in FSH 2470 A trend in either mortality or growth inhibiting factors that indicated minimum standards will not be met at some future time	\$ 5,000
Suitability for Timber Production	Determine if lands classed as not suited for timber production are suitable	Project evaluation and timber inventory	High	Annually for projects examined & at least every 10 years for all lands	Lands identified as unsuited for any reason are determined and are 10% of current suitable lands	U (*)

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TIMBER (CON'T) (Responsible Official: Timber Management Officer)						
Annual Programmed Sale Quantity Acres and Volume Offered and Harvested by Prescription and Forest Type	Ensure implementation of the timber sale programmed is consistent with the Plan	Management Reviews Programmed Harvest Statement Timber Sale EAs	High	Annually/ 10 years	30% of acres and 10% of allowable sale quantity volume for a decade, by prescription, or by forest type	\$ 1,000
VISUAL RESOURCES (Responsible Official: Recreation Staff Officer)						
Visual Condition of Forest	Determine if VQOs are being met as per Plan	Field reviews & photo points	High	Annually/ 10 years	VQO and EVC as defined in FSM 2380 5% failure to achieve the planned VQO on total projects	\$ 2,000
Trend of Visual Character	Determine if desired character stated in plan is being approached or maintained	Field reviews with landscape control point photo method	High	5 years/ 5 years	Plan and PSW-91 of 1973 Indication of trend away from the stated goal	\$ 2,500
Visual Resource Improvement	Determine if an active program of visual resource improvement is being carried out	Field reviews and photo point	Medium	Annually/ Annually	Plan and Planning records and FSM 2380 Less than 50% accomplishment of visual resource improvement projects in any year	\$ 500
WATERSHED: SOILS AND WATER (Responsible Official: Watershed Staff Officer)						
Soil Productivity	Verify adequacy of Prescriptions, Standard and Guidelines in maintaining and improving soil productivity	Observations & measurements, and validate the use of BMPs in project activity	Medium	Annually/ 5 years	Improvement and maintenance measures 90% successful, 90% of prescribed BMPs are implemented	\$14,000

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WATERSHED: SOILS AND WATER (CON'T)

(Responsible Official Watershed Staff Officer)

Water Quality Management	Assess compliance with BMP direction, and to continue to evaluate the effectiveness of BMP	Review of prepared EAs, review of contract provisions, field activity reviews, water quality analysis field observations	High	Ongoing as part of EA and contract review process, and as field trips are taken Annual activity review	Implementing documents for three projects are found to be missing needed water quality mitigation measures Water quality objectives violated Two field reviews identify mitigation measures are not being implemented	\$12,000
Watershed Improvement	Evaluate effectiveness of watershed improvement measures	Observations and measurements	Medium	Annually/ 5 years	80% survival rate of project over a 10 year period	\$ 5,000

WILDLIFE

(Responsible Official Wildlife Staff Officer)

Goshawk	Ensure project compliance with Forest-wide Standards and Guideline Determine population & habitat trends	Survey all known nest sites within areas managed for timber annually Survey 50% of known nest sites outside of areas managed for timber annually	Medium	Annually/ Annually Specific project EAs or reports	Forest-wide Standards and Guide lines and habitat capability models	\$ 3,000
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WILDLIFE (CON'T)						
(Responsible Official Wildlife Staff Officer)						
Mule Deer	Insure compliance with California Fish & Game Deer herd management plans, Forest-wide Standards and Guide-lines, Management Area Direction	Coordinate compliance counts with California Fish and Game, evaluate habitat for specific proposed project	Medium	Annually/Annually	Previous census information, Forest-wide Standards and Guide lines, Management Area Direction and reports state deer herd plans, deviation from standards of these documents +/- 10% change in population levels over 5 years	\$ 8,000
Peregrine Falcon Recovery	Verify nesting and re-productive success of peregrine falcons Implement recovery plan Two nesting pairs	Field surveys of historic nest areas and high potential nest sites	Medium/High	Annually/Annually	Establishment of two nestings pairs Comparison of sightings from year to year No active site in 5 years or decline in sightings over 5 years	\$ 2,000
Sierra Nevada and Nelson Mountain Sheep	Insure compliance with Forest-wide Standards & Guidelines, and recovery plans	Conduct herd composition counts with California Fish and Game, of existing populations, will be inventoried every other year	Medium/High	Annually/2 years	Recovery plan objectives, Forest-wide Standards and Guide lines, previous censuses, +/- 10% change in population levels over a 5 year period or or deviation from above documents	\$ 8,000
Winter Bald Eagle Habitats	Implement recovery plan Evaluate trends of habitats delineated to meet recovery goals Determine trend of winter populations	Survey known winter areas, survey capability of delineated habitats for specific proposed projects	Medium/High Winter areas High/High Specific projects	Annually/Annually or reports	Forest-wide Standards and local recovery plans, and Habitat Capability Models and Forest-wide Standards and Guidelines, deviation from the above or +/- 25% change in population levels	\$ 2,000

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WILDLIFE (CON'T)						
(Responsible Official Wildlife Staff Officer)						
Other State listed or sensitive species as affected by specific projects Sierra Nevada red fox, pine marten, fisher wolverines, and spotted owl, great gray owl	Ensure protection provided by Forest-wide Standards and Guideline and Habitat Capability Models	Appropriate survey methods Application and development of Habitat Capability to delineate habitats on project areas	Medium	Project Basis/ Project Basis	Past population surveys, Habitat Capability Models, Forest-wide Standards and Guidelines, or lowers habitat capability for species	\$ 8,000
Threatened Endangered and Sensitive Species Management	Ensure that management activities afford protection of all Threatened Endangered and Sensitive species as prescribed in Plan	Sample EAs and conduct field surveys of completed project	Medium	Annually/ Annually	Any detectable decline in population	\$ 4,000
Trends of Habitat Capability for Management Indicator	To ensure that habitat capability trends for MIS are consistent with Plan direction.	Field surveys and office review of projects to determine habitat capability for MIS	Medium	Annually/ 5 years	20% variation in expected change in habitat capability, or habitat capability is 10% above viable levels	\$ 6,000

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WILDLIFE (CON'T)						
(Responsible Official		Wildlife Staff Officer)				
Quantity and Distribution of Snags and Downed Logs	Ensure minimum quantity, quality, and distribution of snags, dead and down woody material	Review EAs and conduct field surveys of completed projects; monitor MIS group	Medium	Annually/5 years	Any detectable decline in snags and downed logs from shown in Forest-wide Standards and Guidelines	\$ 2,000
Relationship between MIS and Represented species	To validate that maintenance of MIS habitat capability maintains habitat for the species they represent	Field survey to determine if represented species are present	Medium	Annually/5 years	70% of species represented are present	\$ 6,000
WILDERNESS						
(Responsible Official		Recreation Staff Officer)				
Actual Use Compared to Planned (established) Desired Conditions	Measure changes and compare with limits of acceptable change and evaluate associated environmental effects	Remeasure campsite condition class, record changes according to FSM2323 1 R-5 supp #145	Medium	Annually/5 years	Any decline in campsite condition Class below Class III	\$20,000