SECTION 5

MONITORING AND ADAPTIVE MANAGEMENT

I. Introduction

Monitoring is an important aspect of all management actions in the forest. The Citizen Advisory Committee noted the following expectation of DNR regarding monitoring:

> "We believe that monitoring is critical to judging incremental progress in reaching the goals for the Loomis Forest. DNR will adapt its management accordingly. Funding must be provided for monitoring."

Monitoring asks two questions: (1) Are the plan objectives being implemented (are we doing what we said we would do)? and (2) Are the objectives moving the forest towards its desired future condition (are our planning assumptions and guidelines sound)?

From data collected through monitoring, it will be possible to refine our assumptions and knowledge of the natural processes and management activities affecting the forest ecosystem. Monitoring is the feedback loop proving whether or not our actions are moving the forest towards the desired future condition.

Meeting the Plan's Objectives

Objectives are those parts of the Loomis Plan that have measurable results. Before any management action is taken, the likely effects of that action must be evaluated in terms of the plan. When an action has been completed, it must be evaluated again to see if it truly had the desired effect (site evaluation feedback).

To record activities and results, and to make this information readily available to field staff, the Department is developing a GIS-based system called "Planning & Tracking". Planning & Tracking will include the ability to attach text files to GIS map polygons in data layers making data recall and map-based analysis easier for site evaluation feedback.

Adaptive Management

As we attempt to manage on an ecosystem basis, more detail will be added into the landscape database. Combining such things as wildlife habitat surveys, stream quality monitoring, vegetation and sensitive plant inventory and monitoring, soils inventory, etc. will make it possible to refine the state of our knowledge of natural science, and develop better predictors of ecosystem processes.

As information is gathered and analyzed through monitoring, adaptations to landscape operations will be made. Monitoring and adaptation will be an ongoing part of forest management operations.

Funding

Some monitoring is built into and funded through specific management programs (i.e. Forest Resources Division inventory information). Other monitoring needs are identified, but funding is required for implementation. Other monitoring may occur with other agencies (e.g. Department of Ecology monitors water quality; Department of Fish and Wildlife monitors lynx).

II. Resource Monitoring

MONITORING NEEDS	FUNDING
AIR Fuel Loading: Monitor progress in fuel loading reduction by periodically preparing and comparing fuel loading amounts in GIS (5 year intervals).	Funding needed for district staff time and GIS support.
FISH Fish monitoring will be accomplished under water quality segment.	
GRAZING Resource Impacts: Areas with a need for improvement, and sensitive plant or animal habitats will be identified and prioritized and entered in GIS planning and tracking (when developed). Site specific protection and or rehabilitation management plans will be developed and site conditions monitored biannually for impacts. Exclosure Plots: Monitoring of exclosure plots and comparison grazing plots in place in and adjacent to the NAP will continue to gather data on effects of grazing on vegetation potential and annual growth comparisons.	DNR monitoring funded through program costs. GIS funding needed as noted in soils monitoring. DNR funding in place.

MONITORING NEEDS	FUNDING
GRAZING Stream Conditions: Stream channel condition plots have been established in various creeks to measure streambank integrity and stream conditions related to cattle impacts. Stream plots will be monitored biannually to mark improvements or degradation and results noted in NRCS reports.	Funded, monitored by DNR.
Range Utilization and Suitability: Inventory, map and rate forest every 5 years recorded grazing utilization and range conditions (poor-fair-good-excellent) and woodland grazing suitability (low-medium-high) and store on GIS. Compare whether gains or losses are being recorded in each category and adjust grazing program accordingly.	Funding in place through DNR programs.

MONITORING NEEDS RECREATION	
Level of use: Monitoring of recreational use of the forest and provided facilities will be done in conjunction with user surveys and internal studies (i.e. 1995 campground inventory) to determine necessary level of management.	DNR monitoring through program costs. Formed user survey/invnetory would require additional funding.
Impacts: Recreational use impacts to soils, wildlife habitat, riparian areas, sensitive vegetation areas, archaeological and cultural areas, etc. will be monitored. When unacceptable levels of impact are experienced, user group education, enforcement and/or recreation management changes will occur to reduce impacts.	Funding in place through DNR programs.

MONITORING NEEDS	
SOILS	
Maintaining Long-Term Potential Productivity: Guidelines state that management-influenced soil degradation will not occur on more than 20% of an activity area. This will be monitored through timber sale compliance. Guidelines state that broadcast or underburning will be conducted during the spring or early summer and while the surface soil is moist in order to minimize soil organic matter and soil productivity losses. Burns will be approved and monitored by the District and coordinated with the Region.	Ongoing sale by sale basis by District during contract compliance or other proposed management action will be prioritized during the budget process.
Minimizing Erosion and Sedimentation: Guidelines state that proposed activity area will receive an on-site evaluation to develop site-specific timber harvest, site preparation or road construction prescriptions to deal with potential surface erosion and/or mass wasting problems. Sites with these potential erosion problems will be identified in GIS Planning and Tracking (when developed) and will be monitored regularly at the end of spring snow melt and during major rainfall events. Monitoring of surface erosion on timber harvest units will not be necessary after vegetation has become established on exposed mineral surfaces.	Ongoing site review by District staff. Funding available through program costs. GIS planning and tracking funding existing. GIS extension file funding needed to track site specific conditions noted.

MONITORING NEEDS	FUNDING
TIMBER Regeneration: Harvest levels will be reviewed to insure desired stocking levels are obtained at 5, 8, 15, 30, and 60 year intervals. Records will be stored in GIS planning and tracking.	District staff will conduct monitoring. Funding available through program costs.

MONITORING NEEDS	
WATER	
Water Quality Cumulative Effects:	Joint DOE/DNR monitoring project. DOE supplying technical support. DNR region staff monitoring plots subject to budgetary priorities.
Stream plots have been established by DOE to measure stream conditions and invertebrate populations. Plots will be monitored annually in August to determine forest management impacts on water quality.	District staff and forest hydrologist monitoring. Funding in place.
Monitor open-equivalent threshold level calculations and impacts to ensure appropriate hydrologic maturity levels are being maintained.	
Operational Water Quality:	District staff monitoring (see soils monitoring - road erosion).
Management influenced sediment sources include roads and cattle-damaged streambanks. Inspect roads on a regular basis to determine standard and guideline effectiveness of preventing transport of sediment to streams.	District staff monitoring (see grazing - stream condition).
Inspect critical riparian areas to determine effectiveness of standards and guidelines and CRMP's for promoting recovery.	
Water Quantity:	
Use channel evaluation to detect damage by flow increases (DOE plots) and annually contact water users about noticeable changes in flow.	Joint funding needed. ($5,000 purchase. Irrigation District provides labor)
Seek funding (co-sponsor with USFS and Whitestone Irrigation District) to reactivate stream gauge on Toats Coulee so that flow rates can be monitored.	

MONITORING NEEDS	
WILDLIFE	
Lynx Habitat:	
Coordination of monitoring with WDFW and USFS to obtain habitat data and enhance joint research and monitoring efforts. Contrasting pre-harvest and post-harvest treatment and control sites will assist in determining effects of timber harvest activity. Similar monitoring can be conducted for natural disturbance (fire, insect) effects on snowshoe hare habitat.	Joint funding needed involving DNR, WDFW, and USFS. DNR emphasis will be on habitat monitoring.
Track habitat change across Lynx Analysis Units through time. Store data in GIS planning and tracking to facilitate map and data analysis for biologists and field foresters.	District staff and Region biologist will conduct monitoring. Funding available through program costs.

MONITORING NEED	FUNDING
WILDLIFE	
Late Successional Forest Habitat	
Landscape structure and composition (age class proportion, stand size and shape, juxtaposition, fragmentation, connectivity, etc.) of each LSF block will be recorded and remeasured each decade, using aerial photography and GIS. Age class proportions in the subalpine forest fringe will also be tracked. Stand structure and composition (leave tree/down wood size, condition, density and longevity, canopy structure and cover, patchiness, understory density and composition) will be recorded and periodically remeasured, in conjunction with regeneration monitoring.	Region Biologist and District staff monitoring (see also timber); funding through program costs.
Riparian Habitat	
Size and longevity of RMZ's will be recorded and remeasured each decade, using aerial photography and GIS. As forest management activities proceed, information will be verified in the field and the GIS updated. Habitat conditions related to grazing impacts will be monitored by the grazing segment. Stand structure and composition (leave tree/down wood size, condition, density and longevity, canopy structure and cover, understory density and composition) will be recorded and periodically remeasured, in conjunction with regeneration monitoring.	Region Biologist and District staff monitoring (see also grazing and timber); funding through program costs.
Non-timbered Habitats	
Size and location of meadows, aspen stands and wetlands, and vegetation surrounding various rock habitats, will be recorded and remeasured each decade, using aerial photography and GIS. As forest management activities proceed, information will be verified in the field and the GIS updated. Habitat conditions related to grazing impacts will be monitored by the grazing segment.	District staff monitoring (see also grazing); funding through program costs.
Habitats impacted by Roads	
Active and inactive road densities (by WAU) will be recorded and measured every 5 years.	District staff monitoring; funding through program costs.