

CHAPTER 4- MONITORING AND EVALUATION

Overview

The purpose of Forest Plan monitoring and evaluation is to evaluate, document, and report how well we are implementing the Forest Plan, how well the Plan is working, and if Plan purpose and direction remain appropriate. **Monitoring** determines actual conditions and circumstances and compares them with assumptions and expected or desired results. **Evaluation** examines the reasons for the conditions we find and where these do not match desired conditions, identifies potential alternative approaches.

Adaptive management is the foundation for planning and management. We learned from implementing current Forest Plans that plans need to be dynamic to account for changed resource conditions such as large scale wildfire or new listed species under the Endangered Species Act, new information and science, and changed regulations and policies. Monitoring and evaluation of effects of Forest Plan implementation are critical to adaptive management. But they are not the only components of adaptive management. Other components include inventory, assessment, planning and implementation.

Monitoring and Evaluation Strategy

Our Forest Plan monitoring and evaluation strategy is straightforward. We will tightly focus our monitoring and evaluation on decisions made in the Record of Decision (ROD). Elements in our monitoring will include requirements from NFMA regulations, as well as other pertinent laws and regulations.

Through implementing the Monitoring and Evaluation requirements in existing Forest Plans we learned that budgets constrain the amount of monitoring and data collection we are able to accomplish. A secondary goal developed for this strategy was to keep requirements within current budget and workforce limitations. We further refined our monitoring and evaluation questions using the following criteria to highlight priorities. Each of our questions responds to at least one of the following drivers. The drivers are included in the table at the end of this section.

1. New untested management assumptions (implementation of new concepts like key watersheds).
2. Large gap identified between existing and desired conditions (aspen cover is currently less than 20% of the low end of the historic range of variation for aspen).
3. Critical system components could be affected (projects affecting TE&S species).
4. Unacceptable consequences from lack of information (occupation of habitats by invasive species).
5. Key issue for the public (travel management and specifically, motorized closures).

6. Legal compliance (Historic Preservation Act or sufficient stocking of suitable timber lands).
7. National strategic plan (Goals & objectives as described in Fiscal Years 2004 through 2008).

Indicators and methodologies were selected keeping the following principles in mind.

- Keep it simple and relevant to the purpose.
- Keep it adaptive. Systems are always in a state of flux, as is the imprint of management on such systems
- Recognize that systems are interrelated. Select components of systems that can tell more than one story.
- Look for trends over long periods, not snapshots in time. The goal of resource management is resilience. Since we intend to maintain the capacity of systems to renew themselves and thrive, not just survive for a time.
- Describe what to measure but don't prescribe a specific technique. Science improves, methodologies change. **But** where corporate data and standardized national protocols are available we will use them (FIA, NVUM, etc).

Additional screening considerations for methodologies include: availability of baseline data, availability of protocols/methods, scale and extent, cost and feasibility, precision and reliability, sufficiency to address the indicator, availability of partners, utility for analysis and evaluation, appropriateness of scale, frequency of measurement, and technical requirements

The monitoring identified in this Forest Plan does not include monitoring conducted in compliance with other laws, policies, and site-specific decisions. Examples are compliance with the Biological Opinion for bull trout, or the Settlement Agreement for the Beaverhead Riparian Grazing Lawsuit, progress toward removing streams from the State's 303D list, and project implementation monitoring.

Forest Plan Evaluation and Reports

Forest Plan evaluation uses the facts and figures gathered during monitoring to tell how Forest Plan decisions have been implemented and how effective they have been. It tells us what we've learned along the way and how valid the assumptions are that led to those plan decisions.

The Forest Supervisor will maintain monitoring information for public review and will evaluate it on a periodic basis to determine, among other things, need for amendment or revision of the Forest Plan. Formal evaluation and reporting will occur every 5 years, unless the Forest Supervisor determines a shorter timeframe is warranted for some evaluations. The 5-year review will provide a comprehensive evaluation of information in response to monitoring questions and regulatory review requirements.

Monitoring Elements

The following table displays the Monitoring Plan for the Revised Beaverhead-Deerlodge Forest Plan. This monitoring reflects important decisions made in the Forest Plan. It includes nine different areas of focus tied closely to key design elements and objectives. For each area questions are posed along with one or more indicators that will be measured. In many cases annual measurement will need to be evaluated after multiple years to determine trends and in some cases, the focus may shift after 5 years of implementation.

The table addresses requirements from the 36 CFR 219.12(k)(4) of 1982, and includes:

- ◆ The actions, effects or resources to be measured, and the frequency of measurements;
- ◆ Expected precision and reliability of the monitoring process
- ◆ Timeframes for evaluation and reporting.

Because data precision and reliability are tied to specific procedures and methods that change as we learn, we expect to update the Forest Monitoring Section to allow change.

We expect to achieve monitoring and evaluation in each area described in the table, but actual budget levels, funding emphasis, and emergence of new issues may affect accomplishment. Even with changes in funding emphasis tied to current issues, we expect to be able to monitor and evaluate some movement toward objectives in each focus area. We also expect that partnerships can be developed to accomplish more monitoring and evaluation.

Table 1. Beaverhead-Deerlodge National Forest Monitoring Items

Monitoring Question	Drivers described on page ##	Indicator	How to measure	Measurement (M) and Reporting (R) Frequency	Data Reliability
Aquatic Health					
Are management actions and Forest Plan direction effectively maintaining or improving watershed conditions?	1, 3, 7	Status and trend measured by changes in watershed, channel and habitat conditions of 6 th code HUCs	Random sample of _____ across the Forest using Regional Aquatic Protocol (under development)	M - Annual R - 5 years	High
Have restoration and conservation activities been focused in priority (key) watersheds?	1, 2, 3	Number of watershed plans completed, number of projects completed in key watershed vs. other watersheds.	Report annual accomplishments of Plans and Projects.	M - Annual R - 5 years	Moderate to High
Are Forest Plan standards effectively protecting stream and riparian conditions?	2, 3, 7	Stream function, riparian vegetation PNC	Reread stream and riparian transects at 5-year intervals, representing key watersheds and management activities.	M - Annual R - 5 years	Moderate to High
Are we implementing Best Management Practices during project work?	5	Project reviews and compliance summaries by integrated review teams.	Annual review of two projects, including fuels reduction, timber harvest, and grazing. Compare BMPs prescribed by EA, EIS or contract, to see if BMPs were followed and were effective.	M- Annual R - 5 years	High
Are management activities maintaining water quality?	6, 7	Changes distribution and abundance of populations of the mayfly (<i>drunella dodsii</i>) at sampling points, correlated to water temperatures	Establish sampling points on integrated reaches at lower end of 6 th code HUCS. Establish 5 year baseline, then resample for trends.	M - Annual R - 5 Years	Moderate

Monitoring Question	Drivers described on page ##	Indicator	How to measure	Measurement (M) and Reporting (R) Frequency	Data Reliability
Terrestrial Health					
Are vegetation cover types, size classes and stand components trending toward HRV as described in Forest Plan Objectives?	2, 3	Changes and trends in cover types and size classes, percent of old growth by species, number of snags, and tons of coarse woody debris by landscape Forestwide	Inventory stands across the Forest using FIA national inventory and other local Forestwide or project level inventories	M - 5 years or sooner R - 5 years	High
Are we restoring aspen at the rate projected in the Forest Plan?	1, 2, 3	Acres of aspen treated. 5-year survival of aspen sprouts	Compile acres treated. Survey treatment areas at 3 and 5 years and report sprouts/acre and browse history.	M - 3 and 5 years. R - 5 years	Moderate to High.
Are we restoring grassland/shrublands at the rate projected in the Forest Plan?	2	Acres of encroachment species treated	Acres treated annually	M - Annual. R - 5 years	High
Are noxious weed infestations increasing or decreasing in number and/or size?	3, 4, 5, 7	Acres of known noxious weed infestations.	Number and acres of existing and new infestations.	M - Annual R - 5 years	Moderate to High.
Are levels and types of invasive species increasing?	3, 4, 7	Number of new species and extent.	Annual review of reports of known species and locations.	M - Annual R - 5 years	Moderate
Are we maintaining static or upward trends in globally designated 1 & 3 sensitive plants (downward trend drives Conservation Strategy).	3, 4	Change in cover or number of plants.	Plant survey.	M - 5 years R - 5 years	High
Are levels of insect and disease increasing as a result of management activities?	6	Changes in acres infested or infected in project area.	Regional aerial surveys.	M - 5 years following R - 5 years.	Moderate
Are wolverines present in reserved non-motorized high elevation habitats?	3, 6	Presence or absence of wolverines.	Bait stations and DNA testing. Coordinate with MT FWP and other partners for additional population survey data.	M - Annual R - 5 years	Moderate

Monitoring Question	Drivers described on page ##	Indicator	How to measure	Measurement (M) and Reporting (R) Frequency	Data Reliability
Are non-motorized high elevation habitats for wolverines left undisturbed by snowmobiles?	4	Number of snowmobile entries into non-motorized high elevation units (Part of Recreation item #2).	Citations for violations and aerial observation flights	M - Annual R - 5 years	Moderate to High
Is fire being restored to the landscape through wildland fire use?	1, 2	Number of Fire Use Plans completed. Number of ignitions allowed and acres burned per ignition.	Compile information from annual fire reports and summarize.	M - Annual R - 5 years	High
Are we reducing the risk of uncharacteristic fire across the Forest?	1, 7	Acres of CC 2 or 3 in FR 1, 2 or 3 treated,.	Annual project reports and MARS accomplishments	M - Annual R - 5 years	High
Recreation opportunities					
Are recreation use levels changing, are shifts occurring between types of activities and locations?	5	Changes and trend in number of visitors participating in activities	Survey visitors every 5 years using National use survey protocol.	M Annual R 5 years	High
Are travel allocations effectively providing a variety of settings and opportunities?	5	Compliance with travel restrictions.	Number of citations for travel violations and field observations of District staff.	M 5 years R 5 years	Moderate
Are the miles of roads and trails available for summer motorized use changing?	5	Miles of roads and trails open at some time from May 1 to December 1.	Summaries from Forest Road and Trail Inventory (GIS).	M Annual R 5 years	High
Are we maintaining and reconstructing campgrounds and developed sites on schedule? (30% over the planning period)	5, 7	Number of sites reconstructed.	Report based on MARS accomplishments	M Annual R 5 years	High
Protection					
Are fuels reduction projects being implemented in high risk urban interface areas?	2, 5, 7	Acres of fuel reduction in mapped wildland urban interface areas (WUI).	Report % of WUI acres treated based on MARS accomplishments	M Annual R 5 years	High

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Timber Production					
Are we managing suitable lands for timber production?	5	Acres harvested on suitable lands compared to acres harvested on unsuitable lands. Acres of silvicultural exams and thinning for timber stand improvement.	Annual accomplishments from TSMRS and MARS.	M - Annual R - 5 years	High
Socio/Economic Health					
How is management of the BDNF affecting the local economy, local uses and lifestyles?	5	Contribution of employment and labor income to the 8-county impact area.	Report outputs (i.e. AUMs, Board Feet), revenues and expenditures for the Forest.	M - Annual R - 5 years	High
Emerging Issues					
Are new issues emerging or social values changing?	5,6	Lawsuits, appeals, national initiatives, changed conditions	Forest Leadership Team observations and recommendations on which issues may require future Plan adaptation.	M - Annual R - 5 years	Low to Moderate
National Historic Preservation Act:					
Are cultural resources being protected as the Forest Plan is implemented? Are mitigation measures sufficient to prevent damage to cultural resources from projects?	6	Number of projects that protected cultural resources.	Review up to 10% of projects in the field.	M - Annual R - 5 yrs	Moderate

Monitoring Question	Drivers described on page ##	Indicator	How to measure	Measurement (M) and Reporting (R) Frequency	Data Reliability
NFMA compliance					
Are we complying with appropriate NFMA requirements?	6	Stocking of lands	Trees/acre, over percent of area treated by tree species.	M - 5 years from treatment R - 5 years	High
		Lands suited for timber production	Lands identified as not suited for timber production examined to determine if they have become suited.	M 5 years R 5 years	High
		Harvest Unit size limits	Maximum size limits for harvest areas evaluated to determine whether such size limits should be continued.	M - 10 years from ROD R - 10 years	High