

1997 Revision of the Land and Resource Management Plan for the Arapaho and Roosevelt National Forests and Pawnee National Grassland

Chapter 4: Monitoring and Evaluation

Table 4.1 describes how the Arapaho and Roosevelt National Forests and Pawnee National Grassland will respond to the minimum legally required monitoring items. The specific techniques and protocols to be used are identified in the Annual Operational Plan, which is developed in conjunction with the annual budget and the work planning process. This allows monitoring to be defined based on emerging issues, forest priorities, and the budget. The monitoring methods used are divided into two categories, A and B based on their relative precision and reliability:

A - Methods are generally well accepted for modeling or measuring the resource. Methods used produce repeatable results and are often statistically valid. Reliability, precision, and accuracy are very good. The cost of conducting these measurements is higher than other methods. Methods are often quantitative.

B - Methods or measurement tools are based on a variety of techniques. Tools include: project records, communications, on site ocular estimates and less formal measurements such as pace transects, informal visitor surveys, aerial photo interpretation, and other similar types of assessments. Reliability, accuracy, and precision are good, but usually less than that of **A**. Methods may be more qualitative in nature but they still provide valuable information on resource conditions.

Table 4.1. Minimum Legally Required Monitoring Activities

Action, Effect or Resource to be Measured	Frequency of Measurements	Precision and Reliability	M & E Report ^a
Lands are adequately restocked. 36 CFR 219.12(k)5(i)	Mix of 1st, 3rd & 5th years per FSM 2472.4	A	Annual
Lands not suited for timber production. 36 CFR 219.12(k)5(ii)	Year 10	A	Year 10
Harvest unit size. 36 CFR 219.12(k)5(iii)	Years 5 & 10	B	Years 5 & 10
Control of destructive insects and diseases. 36 CFR 219.12(k)5(iv)	Annual	B	Annual
Population trends of management indicator species in relationship to habitat changes. ^b 36 CFR 219.19(a)(6)	Years 5 & 10	B	Years 5 & 10
Effects of off-road vehicles. 36 CFR 219.21	Annual Review, Analysis years 5 & 10	B	Years 5 & 10
Effects to lands and communities adjacent to or near the National Forest and effects to the Forest from lands managed by government entities. 36 CFR 219.7(f)	Years 5 & 10	B	Years 5 & 10

Comparison of projected & actual outputs and services. 36 CFR 219.12(k)1	Annual	A	Annual
Prescriptions and effects. 36 CFR 219.12(k)2	Years 5 & 10	B	Years 5 & 10
Comparison of estimated and actual costs. 36 CFR 219.12(k)3	Annual	A	Years 5 & 10
Effects of management practices. 36 CFR 219.11(d)	Years 5 & 10	B	Years 5 & 10

^a The frequency of measurement and reporting are triggered by regulation as well as anticipated intervals at which gathered data will provide meaningful information.

^b For further discussion of management indicator species (MIS), see Appendix G of the FEIS. Appendix G describes MIS habitat and effects on habitat. This serves as the basis to monitor population changes of management indicator species.

Forest and Grassland Management Emphasis

Table 4.2 represents Forest Plan monitoring questions that address priority management emphasis, goals and objectives in Chapter 1 of the Forest Plan. These questions will be addressed once legally required monitoring has been accomplished. This portion of M & E activities will vary each year in response to changing issues, budgets, science and methodologies. It is anticipated that the depth of analysis for any of the priority management emphasis questions may also vary from year to year.

Table 4.2. Forest Plan Monitoring Questions for Priority Management Emphasis and Stakeholder/Public Involvement, ARNF-PNG, 1996-2007^a

PROGRAM GOAL TOPICS	MEAS. FREQ.	QUESTIONS TO GIVE FOCUS TO MONITORING AND EVALUATION ACTIVITIES
Priority Management Emphasis		
Biological Diversity General - Successional - Structural Stages	Years 5 & 10	Have the Forests and Grassland made progress toward assuring adequate representation of the full range of successional or structural stages of community types across the forest and grassland landscapes? How has the representation of successional stages been accomplished? (Biodiversity; General - Obj. #12)
General - Ecological Processes & Human Influences	Years 5 & 10	Has progress been made toward improving Forest and Grassland wildlife habitat and watershed condition through modification of system roads, trails and ways? How has this been accomplished? (Biodiversity; General - Obj. #3)
General, Old Growth	Years 5 & 10	Have old-growth quantity and quality been maintained and have management activities assured adequate/sufficient old growth for the future? How has this been accomplished? (Biodiversity; General - Obj. #2) (36 CFR219.)
General, Threatened Endangered and Sensitive Species	Years 5 & 10	Have habitat-improvement projects resulted in protection, restoration and enhancement of habitat for threatened, endangered and sensitive species? What management practices have been most effective? (Biodiversity; General - Obj. #3)
Air, Soil & Water Air Quality Related Values	Year 5	Is progress being made to move air quality related values from at-risk to a maintenance or higher level of protection? How were related values protected and improved? (Biodiversity; Air, Soil & Water - Obj. #4) (CFR 219.23 e)

Air, Soil & Water Forest Emission Budget	Year 5	Has progress been made on developing a Forest and Grassland emission budget? How was the Forest emission budget developed? (Biodiversity; Air, Soil & Water - Obj. #5)
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PROGRAM GOAL TOPICS	MEAS. FREQ.	QUESTIONS TO GIVE FOCUS TO MONITORING AND EVALUATION ACTIVITIES
Air, Soil & Water Functional Watersheds	Annual or as Needed	Has the Forest made progress toward moving sixth-level watersheds from at-risk or non-functional to functional? Which watersheds were improved and how was this accomplished? (Biodiversity; Air, Soil & Water - Obj. #7)
Air, Soil & Water Ecological Land Units	4 ELU' per Year	Has the Forest made progress toward moving Ecological Landtype Units from at-risk to a maintenance or higher functioning level? How was this accomplished? (Biodiversity; Air, Soil, & Water - Obj. #6) (CFR 219.23 e)
Air, Soil & Water Stream Flows	As Needed	Has the Forest made progress toward obtaining (through negotiation, trade or purchase) stream flows to sustain aquatic life and maintain stream processes on up to 5 reaches of stream channels? What were the most effective and cost efficient methods? (Biodiversity; Air, Soil & Water - Obj. #8)
Air, Soil & Water Nonpoint Source Pollution	Annual or as Needed	Has the Forest made progress toward reducing non-point source pollution in Class II and III watersheds and in streams which are not fully supporting State-designated uses? How has this been accomplished? (Biodiversity; Air, Soil & Water - Obj. #10)
Vegetation - High Fire Hazard	Annual	Has the Forest made progress toward reducing the number of high fire hazard, high value, and high and moderate risk acres? How was this accomplished? What was the most effective method? (Biodiversity; Vegetation - Obj. #11)
<u>Human Uses</u> Wilderness	Annual	Is the Forest making progress toward providing designated wilderness campsites where resource impacts from users are evident? (Human Uses - Obj. 2)
Developed Recreation	Annual	Has the Forest made progress toward providing a mix of facility reconstruction, expansion, and, when possible, new development consistent with future use projections? Has this been done to assure quality developed recreational opportunities? (Human Uses, Developed Recreation - Obj. #4)
Dispersed Recreation	Annual	Has the Forest made progress toward reconstructing or rehabilitating impacted dispersed areas and sites, providing new designated dispersed campsites consistent with future use projections? How has this been accomplished? (Human Uses, Dispersed Recreation - Obj #1, #3)
Visitor Satisfaction	Annual	Have the Forest and Grassland made progress toward providing satisfactory recreational experiences to visitors? (Human Uses, Visitor Satisfaction - Obj. # 5)
Travel Management	Annual or as Needed	Have priorities been established and implemented for managing travel to best meet future travel and access needs of Forest users? How has this been accomplished? (Human Uses, Travel Management - Obj #6, #7, #8, #9, #10, #11)

PROGRAM GOAL TOPICS	MEAS. FREQ.	QUESTIONS TO GIVE FOCUS TO MONITORING AND EVALUATION ACTIVITIES
Land Uses & Ownership Boundary Mgt., Access, & Land Ownership Adjustments	Semi Annual	Has the Forest made progress toward improving boundary management, access, and land ownership adjustments to protect and enhance Forest and Grassland resources and to increase management efficiencies? Which approaches have been effective? (Land Uses & Ownership, Boundary Mgt., etc. - Obj. #1, #2)
Case Backlog for SUPs, ROW Grants, & Land Ownership Adjustments	Annual or as Needed	Have the Forest and Grassland made progress toward improving customer services to reduce the number of backlogged cases for special-use permits, rights-of-way grants, and landownership adjustments? How has this been accomplished? (Land Uses & Ownership, SUPs, ROW Grants & Landownership Adjustments - Obj. #2)
Permit Review	Annual	Have the Forest and Grassland made progress toward working with potential permittees to insure that benefitting parties assume the costs of permit review and administration? How has this been accomplished? (Land Uses & Ownership, Permit Review - Goal #2)
Stakeholder & Public Involvement		
Emerging Issues	Annual	Have changes in agency management activities resulted in unforeseen issues that the ARNF and PNG need to address? How were needed changes determined and what recommendations or solutions did the public offer?
Public Involvement	Annual	How and to what extent have the public and stakeholders been involved in assisting implementation, monitoring and evaluation of the Forest Plan.

^aAll monitoring assumes that the full range of management activities follows management area, geographic area, and forestwide direction; laws and management policy; and acceptable resource-protection standards and guidelines. Deviations from this assumption will be identified through the monitoring process.