

APPENDIX B - MONITORING

This appendix contains the detailed monitoring requirements for each alternative. The requirements are provided in table format. The first left hand column provides a identification code (ID) for each requirement; m-# of the requirement. These ID's have been used in different parts of the Environmental Assessment to help facilitate discussions. The last column in the table states which alternative contains the specific requirement.

In the table, specific monitoring questions are identified and directly linked to alternative goals, objectives, standards, and/or guidelines. Each monitoring question has a monitoring item to answer the question. However, every goal, objective, standard, and guideline cannot be monitored. Relevancy to issues, compliance with legal and agency policy, scientific credibility, administrative feasibility, long- and short-term budget considerations, and impact on work force all influence monitoring priorities.

For each monitoring question, a monitoring *task sheet* has been completed and is included immediately following the table. These task sheets are used to develop the details, priorities, and budgeting for answering the monitoring questions. Changes to task sheets will not require a Forest Plan amendment unless the goals, objectives, or standards and guidelines being monitored change.

OVERVIEW

Monitoring and evaluation are the heart of adaptive management and are the quality control mechanisms for the Forest Plan. No single monitoring item or parameter automatically triggers a change in Forest Plan direction. An interdisciplinary, holistic approach is used to evaluate information and decide what changes are needed. Monitoring included in this amendment is intended to determine whether:

- .. Projects are implemented in compliance with plan direction, project design, and the National Environmental Policy Act (NEPA) decision.
- .. Forest and management area standards and guidelines are followed.
- .. Standards and guidelines in the amendment are effective.
- .. The forest is moving toward achievement of planned goals and objectives.
- .. The forest is moving toward the desired habitat conditions.

There are three types of monitoring conducted on National Forests in Utah: implementation, effectiveness and validation monitoring.

Implementation Monitoring: Implementation monitoring answers the question, “Did we do what we said we would do?” It is the most basic level of monitoring. This monitoring determines whether or not projects and activities are designed and conducted in compliance with plan direction, project design, and the NEPA decision.

Effectiveness Monitoring: Effectiveness monitoring answers the questions, “By doing what we said we would do, are standards and guidelines effective, are we effectively accomplishing our goals and objectives, and are we moving toward our desired future condition? Are mitigation measures effective in maintaining habitat for the goshawk and its prey and are goshawk territories remaining occupied?”

Validation Monitoring: Validation monitoring answers the questions, “Are Forest Plan data, assumptions, coefficients, standards, and guidelines used in development of direction still valid? Relative to the goshawk, is there a better way to meet goals and objectives for sustaining habitat for goshawk and its prey?” Validation monitoring assesses the continuing validity of the Forest Plan direction, such as provided in this amendment effort, in light of new information, research, changing policy, emerging issues, and resource conditions.

Monitoring requirements under alternatives considered in detail *include implementation and effectiveness monitoring, only*. Validation monitoring items have not been directly proposed under any of the alternatives considered due to the short-term of the amendment period (projected to be 4 years or less). However, monitoring data collected will be compiled through the amendment period and added to the interagency database maintained by the State of Utah. This interagency database is designed to track long-term implications of management and validate assumptions made in development of the Conservation Strategy for Northern Goshawks in Utah, and interagency agreement (Project Record, Exhibit A, subsection b).

MONITORING REQUIREMENTS

ID	Goals & Obj.	Standards & Guidelines	Question	Item to Measure	Acceptable Range	Measurement Frequency	Report Frequency	Amendment Alternative applied
m- 1	Alt B-E G-9 Alt. F G-10	all under the alternative goal	Are known goshawk territories on national forests remaining occupied?	Goshawk territory occupancy at the forest level.	Less than 20% decline in territory occupancy over a 3 year period.	Annually	Every 3 years	B,C,D,E,- F
m- 2	Alt B-E G-9 Alt F G-10	s-9 (alt. b,c,d,f) s-10 (alt. E only.) G-21 (alt b,c,d,f)	Are mitigation measures (standards and guidelines) employed during vegetative management project implementation sufficient to prevent territory abandonment?	Goshawk territory occupancy following vegetative management treatments.	No territory abandonment on projects where mitigation measures are used.	The first full breeding period following activity in all projects where pre-project surveys determined territory occupancy.	annually	C,D,E,F

ID	Goals & Obj.	Standards & Guidelines	Question	Item to Measure	Acceptable Range	Measurement Frequency	Report Frequency	Amendment Alternative applied
m- 3	Alt B & E-G-3 Alt C & D-G-4 Alt-F-G-10	Alt. B,C,D,F-g-7 Alt. E-s-2	Is habitat connectivity, as represented by structural and species diversity and dispersion thereof, within and among 5th to 6th order watersheds (or equivalent ecological scale) being maintained?	Spatial dispersion and patch size of mature and old forest groups within a 5th to 6th order watershed. Tree species composition mix within mature and old groups within a landscape.	Alt B,C,D and F- approximately 40% of the coniferous and/or 30% of the aspen forested acres within a landscape are in VSS 5 and 6 classes. Alt E- No reduction from mechanical or planned fire activities. All Alts- seral species characteristic of the cover type are well represented in VSS 5 and 6 classes.	Completion of each landscape assessment	Every 5 years	B,C,D,E,-F
m- 4	Alt B-E G-5 Alt F G-10	g-9	Is snag habitat (i.e., number and size of snags) being maintained in desired spatial arrangement?	Snag densities and sizes within a 100 acre block treated by mechanical or wildland fire use.	75% or more of the blocks measured meet guideline requirements.	10% or more of the acres treated within a project area, within 2 years following completion of the vegetative treatment.	Every 5 years	B,C,D,E,-F
m- 5	Alt B-E G-6 Alt F G-10	g-11	Are down woody material and logs being maintained in sufficient amounts, sizes and spatial locations?	Down log and woody debris amounts and sizes within a 10 acre block treated by mechanical or wildland fire use.	75% or more of the blocks measured meet guideline requirements.	5% or more of the acres treated within a project area, within 2 years following completion of the vegetative treatment.	Every 5 years	B,C,D,E,-F
m- 6	G-2	g-27	Are grazing utilization standards being met?	Utilization % by dry weight, or stubble height equivalent, of grasses, forbs, and shrubs.	At least 75% of allotments measured meet guidelines.	Annual utilization measurement on at least 2 allotments.	Every 5 years	D
m- 7	G-10	g-28 g-29	Are appropriate adjustments made to grazing practices in identified "at-risk" locations where grazing is contributing to the "at-risk" condition?	Ungulate grazing practices (i.e.- utilization, season of use, grazing system) in identified "at-risk" locations.	Grass, forb, and shrub production objectives are within the range identified in landscape assessments.	Grazing practices reviewed annually on at least 2 allotments where "at-risk" conditions have been identified.	Every 5 years	F

Task Sheet for Monitoring Requirement "m-1"

Goal/DFC: _____
Alt B-E 9 _____ Provide well distributed habitat for successful goshawk nesting and brood rearing within and across landscapes.
Alt F 10 _____ Restore or maintain forested landscapes in a properly functioning condition (PFC).

Objective: _____

Standard: _____

Monitoring purpose: Track trends in goshawk territory occupancy across the state.
Question(s): Are known goshawk territories on the NFS lands remaining occupied?

Monitoring item: Territory Occupancy- a territory is occupied if evidence of use is present; nesting does not need to be documented.

Range of acceptable results: Less than 20% decline in territory occupancy over a 3 year period on a National Forest.
Reliability: moderate Precision: high

Collection of Information

Who collects: Forest or District Biologist; or Utah Division of Wildlife Resources (partners) (district, research, co-op, etc.)

Method of collection: Most current Regional Protocol for field and data collection. (specific)

Time and frequency of collection: Annual. 50% of known territories or all if less than 20

Source of data (field, research, data base, etc.): field

Cost of collections: \$300/nest

Analysis/Evaluation of Findings

Who conducts: Forest Biologist and UDWR

Method of analysis: Statistical analysis by UDWR of trends in occupancy across Utah. Forest tabulation of findings annually.

Results:

Within range of acceptable results: Y N

Monitoring purpose achieved: Y N

Further monitoring required: Y N

Recommended actions: Y N

Recommended actions implemented: (Date) _____

Cost of A/E: \$300

Total cost of monitoring: \$300/nest plus \$300 for analysis

Report of Findings

Information to be reported: Trend in occupancy by forest and all forests in Utah

Frequency of report: every 3 years

Method of reporting: Written summary of results for Forest Monitoring Report, forest and state database.

Target audience for report: Agency biologists and leadership teams

Task Sheet for Monitoring Requirement "m-2"

Goal/DFC: _____
Alt B-E 9 _____ Provide well distributed habitat for successful goshawk nesting and brood rearing within and across landscapes.
Alt F 10 _____ Restore or maintain forested landscapes in a properly functioning condition (PFC).

Objective: _____
Standard: s-9 (alt b,c,d,f) _____ Prohibit/restrict forest vegetative manipulation within
s-10(alt E) _____ active nest areas during the active nesting period.

Guideline _____
Alt B, C,D, F 21 _____ Restrict management activities within PFA during active nesting period.

Monitoring purpose: To determine if guidelines are being implemented and are effective.

Question(s): Are mitigation measures employed during vegetative management projects sufficient to prevent territory abandonment?

Monitoring item: Territory Occupancy surveys of active territories, after activity.

Range of acceptable results: No territory abandonment.

Reliability: moderate Precision: High

Collection of Information

Who collects: District or Forest Biologist or Utah Division of Wildlife Resources (partners)
(district, research, co-op, etc.)

Method of collection: Most current regional protocol for territory surveys for field survey
(specific) and data collection. All active territories where treatments occur.

Time and frequency of collection: First full season after treatment

Source of data (field, research, data base, etc.): Field

Cost of collections: \$300/nest

Analysis/Evaluation of Findings

Who conducts: Forest Biologist

Method of analysis: Presence or absence

Results:

Within range of acceptable results: Y N

Monitoring purpose achieved: Y N

Further monitoring required: Y N

Recommended actions: Y N

Recommended actions implemented: (Date) _____

Cost of A/E: N/A

Total cost of monitoring: \$300/nest

Report of Findings

Information to be reported: Were measures sufficient to maintain occupancy of territory.

Frequency of report: Annual

Method of reporting: Written summary and nest database

Target audience for report: Forest and District leadership teams

Task Sheet for Monitoring Requirement "m-3"

Goal/DFC: 5 _____ Management of forest vegetation to promote adequate
Alt F 10 _____ Restore or maintain forested landscapes in a properly
functioning condition (PFC).

Objective: _____
Standard: _____
Guideline: 9 _____ When initiating vegetative treatments in forested cover
types, leave the following minimum number and size of
snags.

Monitoring purpose:
Question(s): Is snag habitat (number and size of snags) being maintained
in desired spatial arrangement?
Monitoring item: Number and size of snags per 100 acres within vegetation treatment
areas.
Range of acceptable results: At least 75% of the measured blocks meet objectives.
Reliability: High Precision: High

Collection of Information

Who collects: Stand Examination Crew or Biological Technician
(district, research, co-op, etc.)
Method of collection: Field plots, preferably collected during otherwise scheduled post-
(specific) treatment examinations.
Time and frequency of collection: Once, within 2 years of completion of veg. treatment.
10% of project acres.
Source of data (field, research, data base, etc.): Field Data
Cost of collections: \$100-500 per 100 acres

Analysis/Evaluation of Findings

Who conducts: Silviculturist and Biologist (Forest or District level)
Method of analysis: Comparison of measured data to desired conditions.
Results:
Within range of acceptable results: Y N
Monitoring purpose achieved: Y N
Further monitoring required: Y N
Recommended actions: Y N
Recommended actions implemented: (Date) _____
Cost of A/E: \$250
Total cost of monitoring: \$250 + \$100-500 per 100 acres.

Report of Findings

Information to be reported: Degree of successful attainment of objective.
Frequency of report: Every 5 years
Method of reporting: 5-year Monitoring Report for Forest
Target audience for report: General & Regional Office

Task Sheet for Monitoring Requirement "m-4"

Goal/DFC: 6 _____ Management of forest vegetation to promote adequate
Alt F 10 _____ Restore or maintain forested landscapes in a properly
_____ _____ functioning condition (PFC).
_____ _____
Objective: _____
Standard: _____
Guidelines 11 _____ When initiating vegetative management treatments,
prescriptions should be designed to leave the following
minimum number of down logs and woody debris.

Monitoring purpose:

Question(s): Are down woody debris and logs being maintained in sufficient amounts, sizes and spatial location?

Monitoring item: Numbers and size of down logs, tons of down woody debris.

Range of acceptable results: At least 75% of the measured blocks meet objectives.

Reliability: High Precision: High

Collection of Information

Who collects: Stand Examination Crew or Biological Technician
(district, research, co-op, etc.)

Method of collection: Field plots, preferably collected during otherwise scheduled post-treatment examinations.

Time and frequency of collection: Once, within 2 years of completion of veg. treatment. 5% of project acres.

Source of data (field, research, data base, etc.): Field Data

Cost of collections: \$5-10 per 10 acres

Analysis/Evaluation of Findings

Who conducts: Silviculturist and Biologist (District or Forest level)

Method of analysis: Comparison of measured data to desired conditions.

Results:

Within range of acceptable results: Y N

Monitoring purpose achieved: Y N

Further monitoring required: Y N

Recommended actions: Y N

Recommended actions implemented: (Date) _____

Cost of A/E: \$250

Total cost of monitoring: \$250 + \$5-10 per 10 acres.

Report of Findings

Information to be reported: Degree of successful attainment of objective.

Frequency of report: Every 5 years

Method of reporting: 5-year Monitoring Report for Forest

Target audience for report: General & Regional Office

Task Sheet for Monitoring Requirement "m-5"

Goal/DFC:			
Alt B-E	<u>2</u>	<u> </u>	<u>Maintain or restore native characteristics of ecosystem composition important to sustaining habitat for goshawk and its prey.</u>
Alt B,E	<u>3</u>	<u> </u>	<u>Maintain or restore the mix of forest structural stages need to sustain the desired mature and old forest stages in a landscape.</u>
Alt C,D	<u>4</u>	<u> </u>	<u>Maintain or restore the mix of forest structural stages need to sustain the desired mature and old forest stages in a landscape ... in patterns that are within PFC.</u>
Alt F	<u>10</u>	<u> </u>	<u>Restore or maintain forested landscapes in a properly functioning condition (PFC).</u>
Standard:	<u>Alt E</u>	<u>2</u>	<u>Treatments in VSS 5/6 prohibited.</u>
Guideline:	<u>Alt B,C,D,E,F</u>	<u>5</u>	<u>...provide for a full range of seral species...</u>
	<u>Alt B,C,D,F</u>	<u>7</u>	<u>...treatments in mature/old VSS in landscapes that are at or below desired amount should be designed to maintain or enhance these VSS...</u>

Monitoring purpose:

Question(s): Is habitat connectivity, as represented by structural and species diversity and dispersion thereof, within 5th and 6th order watersheds (or equivalent ecological scale) being maintained?

Monitoring item: Percent of coniferous forest and aspen forest in mature and old stages, distribution of mature and old, and representation of early seral species.

Range of acceptable results: At least 40% of the coniferous and/or 30% of the aspen forested acres within a landscape are mature and old classes. Mature and old structures are distributed across the landscape in patterns that are representative of HRV (as defined by PFC alt. C,D and F). In Alternative E, no reduction in mature and old forests. Seral species characteristic of the landscape are well represented.

Reliability: Moderate Precision: Moderate

Collection of Information

Who collects: Interdisciplinary Team (district, research, co-op etc.)

Method of collection: GIS, aerial photography, forest inventory data, surveys

Time and frequency of collection: Whenever landscape assessments are implemented

Source of data (field, research, data base, etc.): Data base, local knowledge

Cost of collections: Highly variable depending on current data base and size of landscape, costs would be part of the landscape assessment process.

Analysis/Evaluation of Findings

Who conducts: Interdisciplinary Team

Method of analysis: Comparison of data to desired conditions.

Results:

Within range of acceptable results: Y N

Monitoring purpose achieved: Y N

Further monitoring required: Y N

Recommended actions: Y N

Recommended actions implemented: (Date)

Cost of A/E: Highly variable depending on current data base and size of landscape, costs would be part of the Landscape assessment process.

Total cost of monitoring: Highly variable depending on current data base and size of landscape, costs would be part of the Landscape assessment process.

Report of Findings

Information to be reported: Degree of successful attainment of objective.

Frequency of report: Every 5 years

Method of reporting: Landscape Assessment Document

Target audience for report: Forest & Regional Office

Task Sheet for Monitoring Requirement "m-6"

Goal/DFC: 2 _____
Alt D, only _____
Maintain or restore native characteristics of ecosystem composition important to sustaining habitat for the northern goshawk and its prey.

Objective: _____

Standard: _____

Guideline Alt D, only 27 Wildlife and livestock utilization of grasses and forbs should average 20% by weight, and not exceed 40% by weight, in any forested group within a pasture or allotment. For shrubs it should average 40% and not exceed 60% by weight.

Monitoring purpose:

Question(s): Are grazing utilization standards being met?

Monitoring item: Percent utilization as measured by dry weight or stubble height equivalent.

Range of acceptable results: At least 75% of allotments measured meet guideline.

Reliability: High Precision: High

Collection of Information

Who collects: Rangeland Specialist
(district, research, co-op, etc.)

Method of collection: Field inspection.
(specific)

Time and frequency of collection: Annually on at least 2 allotments per forest.

Source of data (field, research, data base, etc.): Field data

Cost of collections: \$3500 per allotment measured; \$7,000 per forest.

Analysis/Evaluation of Findings

Who conducts: Rangeland Specialist

Method of analysis: Comparison of data to desired conditions.

Results:

Within range of acceptable results: Y N

Monitoring purpose achieved: Y N

Further monitoring required: Y N

Recommended actions: Y N

Recommended actions implemented: (Date) _____

Cost of A/E: \$50 per allotment measured; \$100/forest

Total cost of monitoring: \$3550 per allotment measured; \$7100 per national forests.

Report of Findings

Information to be reported: Degree of successful attainment of objective.

Frequency of report: Every 5 years

Method of reporting: Allotment inspection forms / records.

Target audience for report: Forest & Regional Office

Task Sheet for Monitoring Requirement "m-7"

Goal/DFC: 10 _____ Restore or maintain forested landscapes in a properly functioning condition (PFC).

Alt F only _____

Objective: _____

Standard: _____

Guideline Alt F, only 28 Management of grass, forb and shrub vegetation within
& forested cover types to promote adequate production of
29 forage, mast and seed for goshawk prey species.

Monitoring purpose:

Question(s): Are appropriate adjustments made to grazing practices in identified "at-risk" locations where grazing is contributing to the "at-risk" condition?

Monitoring item: Ungulate grazing practices in identified at-risk locations.

Range of acceptable results: Results are within acceptable bounds as identified in the landscape assessment.

Reliability: Moderate Precision: Moderate

Collection of Information

Who collects: Rangeland Specialist

(district, research, co-op, etc.)

Method of collection: Field inspection; ocular to actual measurement depending on factor addressed.

Time and frequency of collection: Annually in allotments where "at-risk" conditions have been identified; however, no more than 2 per forest required per year.

Source of data (field, research, data base, etc.): Field data

Cost of collections: \$250 to \$3500 per allotment depending on element being measured.

Analysis/Evaluation of Findings

Who conducts: Rangeland Specialist

Method of analysis: Comparison of data to desired conditions.

Results:

Within range of acceptable results: Y N

Monitoring purpose achieved: Y N

Further monitoring required: Y N

Recommended actions: Y N

Recommended actions implemented: (Date)

Cost of A/E: \$50 per allotment measured.

Total cost of monitoring: \$150 to \$3550 per allotment depending on element being measured; \$300 to \$7100 per national forest.

Report of Findings

Information to be reported: Degree of successful attainment of objective.

Frequency of report: Every 5 years

Method of reporting: Allotment inspection forms / records.

Target audience for report: Forest & Regional Office