Appendix E – Alternative B Through D Monitoring and Adaptive Management Plan

Introduction

Only key summaries from the comprehensive monitoring and adaptive management plan are included in the DEIS. Most details related to the multiparty monitoring plan have not been included in this summary. Multiparty monitoring is intended to meet the requirements of the Omnibus Public Land Management Act of 2009. This plan outlines who comprises the multiparty monitoring group and how the group works together to determine how data is collected, who will collect the date, where monitoring would occur, and how much monitoring will cost. The complete document can be accessed on the 4FRI Web site or in the project record.

The goal of this document is to (1) meet the Collaborative Forest Landscape Restoration Program (CFLRP) requirements for multiparty monitoring, (2) provide guidance for measuring physical and biophysical, social, and economic results of restoration activities across the initial 4FRI analysis area, and (3) provide a feedback mechanism that supports adaptive management. The information gained through monitoring would contribute to the science and practice of ecosystem restoration. In some cases, the results of this monitoring may not provide definitive answers to monitoring questions.

Types of Monitoring

Ecological monitoring is generally undertaken to determine whether the current state of the system matches or is trending toward some desired condition (Noon 2003). When conducted systematically, monitoring can provide valuable feedback regarding the effects of land management on resource conditions (Palmer and Mulder 1999, Lindenmayer and Likens 2010). Monitoring activities related to land management can be further classified into three categories: implementation, effectiveness, and validation (Busch and Trexler 2003). In addition to land management monitoring, monitoring is required per section 3 of the Comprehensive Forest Landscape Restoration (CFLR) Act (PL 111-11, Sec 4001, Omnibus Public Land Management Act of 2009).

Implementation monitoring is designed to determine the extent to which a management action was carried out as designed (did we do what we said we were going to do).

Effectiveness monitoring tracks the extent to which the management action achieved its ultimate objective. Effectiveness monitoring refers to an assessment of treatment effects, rather than to measuring whether they were applied as intended or whether they validate a pre-existing concept (e.g., did we increase heterogeneity).

Validation monitoring assesses the degree to which underlying assumptions about ecosystem relationships are supported (Block et al. 2001, Busch and Trexler 2003). Validation monitoring is most closely associated with research.

CFLR Act monitoring and reporting (required monitoring and reporting) includes: (1) a description of all acres treated and restored through projects implementing the strategy; (2) an evaluation of progress, including performance measures and how prior year evaluations have contributed to improved project performance; (3) a description of community benefits achieved, including any local economic benefits; and (4) the results of multiparty monitoring, evaluation,

and accountability process. Items 1 through 3 are compiled locally and sent to the USDA Forest Service's Washington Office as part of the annual reporting requirement.

Monitoring Prioritization

Though financial resources (both Forest Service and stakeholder contributions) would be dedicated to monitoring, budgetary limitations would dictate how much and what type of monitoring can be accomplished. In order to help prioritize what monitoring would be accomplished, we prioritized monitoring using a tiered system (table 141). Tier 1 monitoring would take priority over Tier 2 and prioritization within each tier is expected. Research is independent of monitoring, will require funds in addition to this monitoring plan, and Forest Service approval may be required before research is initiated. However, the results of research would be considered during implementation and the adaptive management phase of the project.

Table 1. Monitoring plan tiers

Monitoring Tier	Priority for Completion	Who Will Complete	Type of Monitoring	Type of Funding
Tier 1	1	FS – Contractor	Implementation	Appropriated, Implementation
Tier 2	2	Multiparty FS Stakeholders Agency Partners	Effectiveness	Appropriated, Implementation, Partner
Tier 3	3	Multiparty FS Stakeholders Agency Partners	Effectiveness	Implementation, Partner
Research	No priority. Occurs as approved by forest supervisors.	Research Advocate	Implementation, Process, Effectiveness, Validation	Research Advocate, Partner

Monitoring Scales

Table 142 provides monitoring scales for the project. There are three sets of scales: scales designed to incorporate work completed by the 4FRI stakeholders, scales utilized in the EIS, and scales that tier directly to the forest plans. The stakeholder developed scales are intended to answer specific questions they may be interested in, the EIS scales are designed to provide information on movement toward the purpose and need, and the forest plan scales are designed to provide forestwide information that can be utilized in forest plan monitoring.

The scales developed by the stakeholder reflect the landscape strategy approach, which would monitor at the fine scale (group/site), at the mid-scale (site, treatment area), and at the landscape scale (treatment area, firescape, analysis area, and landscape).

For this analysis, the fine scale is the group or site, the mid-scale is the restoration subunit, and the landscape scale is the restoration unit and/or project area. These scales are typical of those used in forest management.

Table 2. Monitoring scales

Size (acres)	4FRI Stakeholder Landscape Strategy Scale	4FRI Coconino and Kaibab NF EIS	Coconino and Kaibab NF Forest Plans
<1	Group		Fine/Small
1–10	Site		Fine/Small
10–100	Site		Fine/Small
100–1,000	Site		Midscale
1,000–10,000	Treatment Area	Sub-unit	
10K–100,000	Treatment Area /Firescape	Restoration Unit	Landscape
100k–1,000 K+	Firescape, Analysis Area, Landscape	Analysis Area	Landscape

Monitoring Questions and Indicators

Quantitative measures have been used wherever possible, but many of the desired conditions are qualitative and generalized. As specific treatment-level desired conditions are developed, more specific monitoring methods may be incorporated. Scales of measurement in space (scale) and time (frequency) are proposed. Wherever feasible, monitoring is proposed at scales that are large enough to match the landscape approach of the project. For many variables, this could mean using landscape-scale, remotely-sensed data to gather comprehensive information, coupled with adequate ground sampling to verify image classification, develop predictive models, and measure variables that cannot be detected remotely. A very rough estimate of costs has been applied to some of the suggested indicators, but more detailed cost estimation would be needed as the monitoring designs become more specific.

Please note that desired conditions are grouped by theme (e.g., conservation of biological diversity) rather than by scale. Duplicative desired conditions were combined. Monitoring indicators and their associated details have been presented where possible. In some cases, the desired conditions are relatively general, context-dependent, related to policy or implementation rather than effectiveness or aspirational in nature. These cases are indicated with a combined single column that describes the issues associated with monitoring movement toward the desired condition. Table 143 is the implementation monitoring plan. Monitoring questions are largely grouped by treatment type or objective.

Table 144 displays the effectiveness monitoring plan. Additional monitoring questions that do not correspond directly to desired conditions are listed in appendices II to IV of the comprehensive plan (see project record). Table 145 displays effectiveness monitoring with specific trigger point and potential corrective actions related to various project elements.

Adaptive Management

Adaptive management refers to a “rigorous approach for learning through deliberately designing and applying management actions as experiments” (Murray and Marmorek 2003). Monitoring of alternative management actions provides the data for the adaptive management process. As a result of comparing monitoring results to the predicted outcomes, the plan provides a roadmap for

adjusting actions or applying new science as long as the anticipated effects are within the scope of impacts analyzed and disclosed in the EIS and record of decision (ROD). Some of the effectiveness monitoring objectives have adaptive management actions that would be taken if the established thresholds are reached or exceeded. Alternatives B, C, and D have specific adaptive management actions for springs, channels, and roads that have been made part of the alternative (see DEIS chapter 2).

Table 3. Implementation monitoring questions, indicators, frequency of measurement, data source, and cost

Monitoring Questions Derived from Desired Condition	Monitoring Indicator	Frequency of Measurement	Data Source/Spatial Scale/Cost
Are ponderosa pine restoration treatments occurring within the project area?	Acres thinned /green tons removed, acres prescribed burned	Reported annually	Sale administration, USDA FS database of record/RU, forest/thinning cost calculation is determined by location of treatments and amount of service work completed; fire is calculated by individual fire and averaged by fire type.
Were mechanical treatments designed in accordance with the silvicultural implementation guide (see project implementation plan)?	Acres of treatment by treatment type (see project implementation plan for metrics)	Reported annually	Sale administration, USDA FS database of record/RU, forest/cost calculation are actual average cost for all grassland, oak, and aspen treatments by restoration unit.
Did treatments designed to naturalize nonsystem roads occur and were they implemented in accordance with design features, BMPs, and mitigation measures? Were adaptive actions utilized (alternative C)?	Miles of road effectively closed to motor vehicle traffic	Reported annually	Sale administration/RU/average cost of each treatment type by miles of actual treatment.
Did mechanical treatment and prescribed fire actions minimize soil loss and maintain long term soil productivity in compliance with forest plan standards?			
Did channel restoration treatments occur and were they implemented in accordance with design features, BMPs, and mitigation measures? Were adaptive actions utilized (alternative C)?	Miles and acres of channel restored	Reported annually	Sale administration, database of record RU/average cost per mile and acre.
Did treatments in MSO habitat occur and were they implemented in accordance to the project biological opinion?	Acres thinned/green tons removed, acres prescribed burned, acres burned in managed fire	Reported annually	Sale administration, USDA FS database of record/ RU, forest/thinning cost calculation is determined by location of treatments and amount of service work completed, fire cost is calculated by individual fire and averaged by fire type.

Monitoring Questions Derived from Desired Condition	Monitoring Indicator	Frequency of Measurement	Data Source/Spatial Scale/Cost
Were design features and mitigation followed and forest plan requirements met for threatened, endangered, sensitive species?		Reported annually	
Did actions minimize impacts to water resources in a manner that adheres to the Clean Water Act and the intergovernmental agreement between the Forest Service Southwestern Region, and the ADEQ?		Reported annually	
Did actions minimize the spread of noxious weeds in compliance with the forest plans (noxious weeds and special area guidance), FSM direction for noxious weeds and special areas (FSM 2090), FSM 2670 direction for sensitive plants, and the 1995 Arizona Bugbane Conservation Assessment and Strategy for the Coconino and Kaibab NFs?			
Did actions adequately protect Bebb's willow from fire and ungulate use in spring and riparian areas?			
Did actions minimize old and large tree mortality?			
Did actions result in acceptable old growth mortality in areas of concern (snags with known nests or roosts for herons, eagles, osprey, or other raptors and specific areas of old growth)?			
Did actions prevent damage or loss of infrastructure including historic range monitoring sites and allotment and pasture fences?			

Monitoring Questions Derived from Desired Condition	Monitoring Indicator	Frequency of Measurement	Data Source/Spatial Scale/Cost
Were planned prescribed fires coordinated with neighboring forests and other affected agencies and communities?			
Did emission mitigation techniques minimize smoke impacts to sensitive targets and Class 1 airsheds and meet ADEQ requirements?			
Did actions result in reduced crown fire potential and movement toward FRCC 1?			
Were scenery design features and mitigation measures incorporated into mechanical and prescribed fire treatments?			
Were cultural resource protection and mitigation measures incorporated into mechanical and prescribed fire treatments, and were the requirements of the Section 106 compliance report and the heritage protocol met?	Cultural resource sites protected	Post-project/task order review	Sale administration, USDA FS database of record, inspections by archaeologists

Table 4. Landscape-scale effectiveness desired conditions, indicators, frequency of measurement, data source, and cost

Effectiveness Monitoring Desired Conditions	Monitoring Indicator (Tier 1, Tier 2)	Frequency of Measurement	Data Source/Spatial Scale/Cost
Conservation of Biological Diversity			
Ponderosa pine ecosystems provide the necessary composition, structure, abundance, distribution, and disturbance processes that contribute to the diversity of native plant and animal species at the project landscape scale.	Tier 1: Landscape-scale coverage of forest variables: composition, structure, spatial pattern	Annually	Remote sensing (RS) verified by ground sampling/landscape scale/RS data are free but analysis is $15,000 per event, ground plots $2,000 per plot to install, $1,000 per plot re-measure.
Ponderosa pine ecosystems are composed of all age and size classes within the analysis area and are distributed in patterns consistent with the natural range of variability.	Tier 1: Age Structure: tree diameter distribution (note that d.b.h. is only a surrogate for age)	Immediately post-treatment and every 5 years	Remote sensing verified by ground sampling of tree point or canopy area pattern (maps)/landscape scale/RS data are free, ground plots $40,000 to develop spatial model; analysis $5,000 per event.
Ponderosa pine ecosystems are heterogeneous in structure and distribution at the analysis area. Openings and densities vary within the analysis area to maintain a mosaic appropriate to support resilience of individual trees and groups of trees.	Tier 1: Spatial pattern of tree groups (requires specific thresholds for spatial statistics) using Ripley's K and/or Getis/Ord Tier 1: Canopy openness – percent and characteristics of openings	Immediately post-treatment and every 5 years	Remote sensing verified by ground sampling of tree point or canopy area pattern (maps)/landscape scale/RS data are free, ground plots $40,000 to develop spatial model; analysis $5,000 per event
NFMA stocking requirements	Tier 1: Stocking requirements are met in acres managed for regeneration. If the areas do not meet desired stocking after 5 years, conditions that are inhibiting regeneration will be identified and remedial action may be prescribed to ensure regeneration.	At 5 years	Walk-through reforestation certification exam at year 5 post treatment/RS data are free, ground plots $40,000 to develop spatial model; analysis $5,000 per event.
Natural and prescribed fires support diverse native understory communities and their associated biodiversity. Understory vegetation composition and abundance are consistent with the natural range of variability.	Tier 1: Understory vegetation diversity (percent change in cover/bare ground, percent change in high-risk invasive species)	Every 5 years	Ground plots/stand scale/sample strategically to minimize cost, ground plots $2,000 per plot to install, $1,000 per plot re-measure.

Effectiveness Monitoring Desired Conditions	Monitoring Indicator (Tier 1, Tier 2)	Frequency of Measurement	Data Source/Spatial Scale/Cost
Forest conditions facilitate species' movement to and from adjacent landscapes, ecosystems, or habitats.	Tier 1: Spatial analysis of patches (patch area, density, size distribution), corridors, fragmentation, model movement	Every 10 years	Nearest neighbor distance distribution, Contagion, Simpson's Diversity, and Evenness Indices Remotely sensed data/landscape scale/RS data are free, ground plots $40,000 to develop spatial model. Analysis $5,000 per event.
	Tier 2: Songbird species richness: presence/absence Jackknife 2, Chao 2, ICE Species Richness Estimator	Immediately post-treatment and every 2 years thereafter	
Ecosystem Resilience			
A majority of the ponderosa pine ecosystems supports frequent, low-intensity fire.	Post-treatment fuel measurements (CBD, CBH, acres with crown fire potential, acres with surface fire potential, acres of FRCC 1 to FRCC 3)	Annually	No numbers provided.
Water and Air Resources			
Soil productivity, watershed function, and air quality are not at risk of being degraded by uncharacteristically severe disturbances (e.g., landscape-scale, high-severity fire).	FRCC reporting	Annually	No numbers provided.
Springs and associated streams and wetlands have the necessary soil, water, and vegetation attributes to be healthy and functioning at or near potential. Waterflow patterns, recharge rates, and geochemistry are similar to historic levels and persist over time. Water quality and quantity is maintaining native aquatic and riparian habitat and water for wildlife. Designated beneficial uses are consistent with water rights and site capability. Plant distributions and occurrences resilient to natural disturbances. Associated soils are in satisfactory condition.	Tier 1: Changes to the extent of soil saturation or standing water are apparent, taking into consideration the setting and site potential. Changes to the abundance and extents of plants that are obligate wetland and/or facultative wetland species, taking into consideration the setting and site potential Changes to the site that indicate management induced sediment delivery to springs and associated streams and wetlands that indicate soil erosion above tolerance thresholds	Every 5 years	Groundwater Dependent Ecosystems: Level 1 Inventory Field Guide, Inventory Assessments for Field Planning. (Gen. Tech. Report WO-86a). pgs. 35-103.

Effectiveness Monitoring Desired Conditions	Monitoring Indicator (Tier 1, Tier 2)	Frequency of Measurement	Data Source/Spatial Scale/Cost
	Exclosure fencing is protecting the site from adverse impacts caused by ungulate herbivores.		
Emissions factors, smoldering and smoke residence are reduced as fires burn more grass and less green or woody biomass over time.	Smoke emissions by acres burned	Annually	No numbers provided
Economics			
The byproducts of mechanical forest restoration offset the costs of treatment implementation. The average net cost of treatment per acre is significantly reduced over the 10-year period.	Exchange of goods for services contract reporting	Annually	No numbers provided.
The economic value of ecosystem services provided by restored forests are realized and reinvested to support forest restoration and ecosystem management.	Exchange of goods for services contract reporting	Annually	No numbers provided.
Rural communities receive direct and indirect economic benefits.	CFLR business model report	No number provided	No number provided.
Sufficient harvest and manufacturing capacity exists to achieve restoration of at least 300,000 acres in the next 10 years.	Estimate of harvesting and utilization capacity	Every 5 years	Government records, inference from response to contracts, expert opinion.
Social Systems			
There is broad public support or acceptance of collaboratively-based forest restoration decisions, processes, and outcomes, including the use of fire as a management tool.	Public support/concerns assessed	1. Pre- and post-treatment 2. Pre- and post-education/outreach program delivery	Interviews with land managers and focus groups with community members to assess specific issues and concerns, used to develop telephone survey questions/data analyzed: short-term: within analysis area; long-term: across the four forests/$30,000 each pre- and post-measures per analysis area.

Effectiveness Monitoring Desired Conditions	Monitoring Indicator (Tier 1, Tier 2)	Frequency of Measurement	Data Source/Spatial Scale/Cost
Social values and recreational opportunities are protected or enhanced through forest restoration activities.	Social values and recreational opportunities assessed	1. Pre- and post-treatment 2. Pre- and post-education/outreach program delivery	Targeted focus groups (two per organization) aimed at specific user groups (hunters, hikers, ORV, etc.) and/or telephone survey with general public/Data analyzed: short-term: within analysis area; long-term: across the four forests/Focus groups: $5,000 to $10,000 per organization; telephone survey (cost as above).
Rural communities are protected from high-severity fire and their quality of life is enhanced through forest restoration.	1. Frequency and acreage of high-severity fire in and around rural communities 2. Quality of life assessed	1. As projects are completed around communities. 2. Pre- and post-treatment 3. Pre- and post-education/outreach program delivery	1. USDA FS wildfire database/within analysis area (short-term); across the 4FRI area (long-term)/$500 per analysis area. 2. Telephone survey (cost as above).
Rural communities play an active part in reducing fire risk by implementing Firewise actions and creating defensible space around their property.	1. Number of households/neighborhoods that are implementing (the degree of) Firewise principles 2. Number of communities in the analysis/4FRI area	1. Pre- and post-treatment 2. Pre- and post-education/outreach program delivery	1. Telephone survey (cost as above) 2. Interview fire station personnel in neighborhood/home assessments and/or review fire station field.
Treatments within the analysis area minimize short-term impacts and enhance vegetation characteristics valued by forest users over the long term.	Forest user perceptions of treatments within the analysis area	1. 1 year post-treatment 2. 5 years post-treatment	Multiple field trips with forest users (random selection of participants to adequately represent general public)/analysis area/$5,000.

Effectiveness Monitoring Desired Conditions	Monitoring Indicator (Tier 1, Tier 2)	Frequency of Measurement	Data Source/Spatial Scale/Cost
There is low potential for fires to enter communities. Communities and homeowners are prepared for the undesirable case that fires that do enter communities.	1. Fire modeling 2. Number of households and neighborhoods implementing Firewise principles	1. Pre- and post-treatment in WUI communities 2. Pre- and post-education/outreach program delivery	1. 4FRI Science and Monitoring Working Group/communities within analysis area 2. Telephone survey (cost as above). 3. Interview fire station personnel in neighborhood/home assessments and/or review fire station field survey logs/$2,000 to $5,000. 4. Number of neighborhoods certified through Firewise/Communities/USA/$500.
Fire management costs are reduced; aggressive fire suppression is unneeded or rare.	1. Forest Service fire suppression costs 2. Number and acreage of USDA FS suppressed wildfires	Every 10 years	Forest Service records. National Interagency Fire Center records on wildfire occurrence/Analysis area/$1,000.
Heritage Resources			
Cultural resources are not at risk of being degraded by uncharacteristically severe disturbances (e.g., landscape-scale, high-severity fire and soil erosion).	Post-treatment fuel measurements on cultural resource sites	As projects/task orders are completed	No numbers provided.

Table 5. Effectiveness monitoring plan

Desired Condition	Indicator	Metric	Method and Sampling Technique	Scale	Trigger (Threshold Indicating Possible Need for Change)	Adaptive Action
There is reduced potential for introduction, establishment, and spread of invasive species. Existing infestations are reduced.	Invasive plants	Species cover	Field/RS	Site, SU, RU analysis area, landscape	High risk species are not reduced by 50% post-treatment over pre-treatment data within 2 years	Discontinue treatment until alternative approach is development
					Watch list species are not reduced by 90% within 1 year post-treatment	Prohibit mechanized harvest and/or other activities contributing to spread
					Target invasive species are not reduced by 20 % within 5 years	Discontinue treatment until alternative approach is development
		Cheatgrass			Cheatgrass increases above pre-treatment condition	Discontinue treatment in adjacent high risk areas until alternative approach is developed
Ponderosa pine ecosystems provide the necessary composition, structure, abundance, distribution, and disturbance processes that contribute to the diversity of native plant and animal species including common, listed, rare, and sensitive species.	Diversity (wildlife communities)	Songbird species richness	Field (RMBO songbird surveys), RS, modeling	Measured at (1-km point grid) site, SU, RU, analysis area, landscape	5 year decrease in closed canopy, open canopy, and pine-sage species at the treatment area or larger scale	**Closed canopy species:** Increase group size for all treatments (based on ADGF experiment) Reduce intensity of all UEA 40–55 treatments Identify 25% of planned UEA 40–55 treatments and reduce intensity to 25–40

Desired Condition	Indicator	Metric	Method and Sampling Technique	Scale	Trigger (Threshold Indicating Possible Need for Change)	Adaptive Action
						Open canopy species: Increase the size of openings in all treatment types Identify 25% of planned UEA 25–40 treatments and increase intensity to 40–55% **Pine-sage species:** Alter timing of treatment to reduce impacts on sage. Delay post-treatment burning to allow sage recover.
Forest conditions facilitate species' movement to and from adjacent landscapes, ecosystems, or habitats.		Changes in landscape connectivity and permeability	Movement data from transmitted black bear OR grey fox (to represent denser forest conditions) and pronghorn (to represent more open forest condition	RU, Landscape	Restriction of bear/fox movements (reduced connectivity between patches of untreated, higher density, or pine-oak) when comparing pre- to post-treatment. No increase in pronghorn movement when comparing pre- to post-treatment	Increase group size, decrease treatment intensity within known pathways Increase opening percentage Increase treatment intensity within known pathways
		Northern goshawk	Utilize existing framework from USDA FS National Guide-lines, with	RU, Landscape	Trigger points will be assessed as data from Kaibab NF monitoring plan becomes available	Dependent on trigger points and data availability.

Desired Condition	Indicator	Metric	Method and Sampling Technique	Scale	Trigger (Threshold Indicating Possible Need for Change)	Adaptive Action
			proposed modify-cations developed by Kaibab NF staff and LLECB (B. Dickson)			
Understory vegetation composition and abundance are consistent with the natural range of variability.	Diversity (understory communities)	Percent cover native species	Field collected - quadrats	Site, SU, RU	Within 5 years of mechanical treatment, change in cover should be 20 (+/-5)% (15–25%) above controls (Laughlin et al. 2011)	If this threshold is not reached, then reevaluate treatment for management change, taking into account soils and burn treatment, e.g., reduce overstory basal area.
		Percent bare soil within treatment blocks	Field collected - quadrats	Site, SU, RU	Within 5 years of treatment (mechanical and/or fire), bare soil should comprise less than 30% of area affected by treatment.	If bare soil exceeds 30% of area within plots, reevaluate restoration treatment for modification.
		Seedlings and saplings	Field collected - quadrats	Site, SU, RU	Within 10 years of treatment, seedling, and sapling density should be within 0.4 to 3.6 plants/hectare/decade on basalt soils (Mast et al 1999)	If seedlings and saplings fall below this range across sub-units where regeneration is a desired condition, then evaluate implementation of BMPs to increase probability of successful regeneration. If regeneration falls above this range, then

Desired Condition	Indicator	Metric	Method and Sampling Technique	Scale	Trigger (Threshold Indicating Possible Need for Change)	Adaptive Action
						more aggressive prescribed burning may be necessary to reduce plant density.
A majority of the ponderosa pine ecosystems supports frequent, low-intensity fire. There is low potential for unnaturally severe fire to spread across the restoration unit.	Potential fire behavior	Crowning index, torching index, rate of spread	RS and modeling	RU	% of 4FRI veg types with passive or active crown potential <25% after first 5 years and < 10% after 10 years. Patch size of adjacent pixels expressing stand replacement fire sizes: max size 50 acres for first 5 years and max size 10 acres after 10 years.	Reevaluate potential causes: acres treated and/or treatment prescriptions.
Cultural resources – implementation monitoring	Cultural resources condition surveys and/ or damages incurred during implementation	Change in condition of cultural resources	Site visitation post project/task order implementation Discovery of new sites during implementation	Cultural resource property	Cultural resources damaged during implementation	Reevaluate potential causes: acres treated and/or treatment prescriptions, site protection measures implemented, site boundary markings