Four Forest Restoration Initiative, Rim Country EIS

Heritage Resource Report

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for:
4FRI Rim Country EIS

Date

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Introduction/Project Information

The Four Forest Restoration Initiative (4FRI) is a planning effort designed to restore forest resiliency and ecosystem function in ponderosa pine forests across four National Forests in Arizona including the Coconino, Kaibab, Apache-Sitgreaves, and Tonto National Forests. In 2015, the Record of Decision for the first 4FRI environmental impact statement (EIS) for the northern portion of the Coconino National Forest (NF) and the Kaibab NF was signed. The Rim Country EIS continues the ecosystem restoration effort on about 1,240,000 acres on the Mogollon Rim and Red Rock Ranger Districts of the Coconino NF, the Black Mesa and Lakeside Districts of the Apache-Sitgreaves NF, and the Payson and Pleasant Valley Districts of the Tonto NF.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and the implementing regulation 36 CFR 800, the potential effects of an undertaking (i.e. the proposed alternatives described in Rim Country EIS) on historic properties need to be taken into account for all activities being proposed within the Rim Country EIS. A cultural resource analysis of a project area also must be completed as part of the NEPA analysis. However, because Rim Country is a landscape scale project area, effects to cultural resources will be evaluated for each individual proposed action within the project area prior to the implementation. This specialist report will be an overview of the current conditions and the predictable effects of the alternatives proposed within the Rim Country EIS on cultural resources. This report will also discuss the strategies that have been developed to aid in the effective and efficient evaluation of the individual task orders, and the methods and mitigation measures that will be employed to minimize adverse effects to cultural resources.

Relevant Law, Regulation, and Policy

Forest Service Heritage Guidance
The Forest Service Manual (FSM) 2360 and individual Forest Plans are the primary agency direction for Heritage resource management practices in the agency. All standards and guidelines from the existing and proposed plans were incorporated into the evaluation of effects for the Rim Country Heritage analysis.

National Historic Preservation Act
The primary legislation governing Heritage resource management in the Forest Service is the National Historic Preservation Act (NHPA) of 1966 as amended. Section 106 of NHPA requires Federal agencies to take into consideration the effects of their undertakings on properties listed in or eligible for the National Register of Historic Places. Federal Regulation 36 CFR 800 contains procedures for implementing Section 106.

Programmatic Agreement
A Programmatic Agreement (PA) between the Southwestern Region of the Forest Service, the Arizona, New Mexico, Texas and Oklahoma State Historic Preservation Offices and the Advisory Council on Historic Preservation (USDA 2003) guides national Forests in Region 3 in identifying, evaluating and protecting cultural resources on National Forest System lands. Stipulation IV.A.4 of the PA provides for the development of "standard consultation protocols" for certain classes of undertakings where effects on historic properties and resulting protection and treatment are similar and repetitive. Appendix J is a protocol for large-scale fuels reduction, vegetation treatment and habitat improvement projects developed in consultation with and signed by the Regional Forester, all four SHPOs, and the Advisory Council. The Forests follow the PA and Appendix J for these types of undertakings in lieu of the 36 CFR 800 regulations. In addition to Appendix J of the PA, the Rim Country Environmental Impact Statement,

NHPA Compliance Sample Survey Strategy for Mechanical Treatments (Hangan *et al* 2017) was developed in consultation with the Arizona State Historic Preservation Office (AZ SHPO) and Native American Tribes. The Sample Survey Strategy was designed to supplement the guidance in Appendix J by focusing specifically on strategies for evaluating proposed mechanical treatment projects.

Other Laws and Regulations
Several other laws address aspects of Heritage resource management on National Forest lands. These include the *Archaeological Resource Protection Act of 1979* (ARPA), as amended. Among other provisions, this act requires tribal notification and consultation regarding permitted removal or damage to archaeological sites and artifacts on Federal lands. The second relevant legislation is the *Native American Graves Protection and Repatriation Act* of 1990 (NAGPRA). This legislation recognizes tribal affiliation of Native American human remains, associated funerary objects, sacred items and objects of cultural patrimony that may be discovered on public lands and requires consultation prior to their removal. Finally, *the American Indian Religious Freedom Act of 1978* (AIRFA) requires Federal agencies to consider the impacts of their actions on Native American traditional cultural practices and to ensure access to cultural sites.

A number of Executive Orders including 11593 (Protection of the Cultural Environment), 13007 (Indian Sacred Sites), 13175 (Tribal Consultations) and 13287 (Preserve America) give direction related to Forest Service Heritage Program Management.

Forest Plan Direction

The Rim Country EIS covers three National Forests, the Coconino, Apache-Sitgreaves and Tonto, which have three separate Heritage Programs and three separate Forest Plans. The following section lists the criteria and direction for Heritage Resources from all three Forest Plans that are relevant to this project. For a complete list, consult the individual Forest Plans.

Apache-Sitgreaves National Forest Plan (USDA FS 2016)[1]

When resource management conflicts occur, the values of cultural resources preservation are weighed against the values of the proposed land use. In assessing the priority for preservation of cultural resources, consideration is given to the following: (1) listing on or eligibility for the National Register of Historic Places (NR); (2) adequacy of present methods of investigation and data recovery to realize current research potential; (3) likelihood that the resource will have greater importance for addressing future research questions than current ones; (4) presence of values associated with significant historical persons or events, traditional cultural or religious values, or unique interpretive values where those values exist undisturbed in their original context(s); (5) likelihood of disturbing historic or prehistoric burials; (6) significance based primarily on architectural character and integrity of the resource' setting; (7) importance of preservation in place relative to the objectives of the State Historic Preservation Plan; and (8) site densities that make data recovery economically infeasible or require unattainable operating conditions. Where preservation in place is important under these conditions, consideration is given to project redesign, relocation, or cancellation. If adverse effects cannot be avoided, they are mitigated per 36 CFR § 800.

Areas rated as highest priority for non-project cultural inventory are those: (1) known or thought to be threatened by looting and/or effects from visitor use or other forces, (2) expected to have high site densities, and (3) important to understanding the historic or prehistoric occupation of the Forests.

[1] The following is found on pages 89-92 of the Forest Plan

Sites that need management or treatment plans are prioritized as follows: (1) sites subject to on-going impacts or deterioration, (2) sites of high traditional, scientific, or community value, and (3) historic buildings or facilities with high potential for adaptive reuse.

The Apache-Sitgreaves National Forest Plan provides management direction for cultural resources as follows:

Standards

Cultural Resources	--	ST 22	Human remains shall not intentionally be excavated for educational purposes (e.g., research, field schools).
Cultural Resources	--	ST 23	Contracts, permits, or leases that have the potential to affect cultural resources shall include appropriate clauses specifying site protection responsibilities and liabilities for damage.

Design Criteria

Cultural Resources	--	DC 263	Significant cultural resources (i.e., prehistoric, historic, traditional cultural properties (TCPs), and known American Indian sacred sites) are preserved and protected for their cultural importance and are free from adverse impacts.
Cultural Resources	--	DC 265	Eligible and historically-significant [2] cultural properties are listed on the National Register of Historic Places.

Guidelines

Cultural Resources	--	GL 122	Activities that have the potential to adversely affect cultural resources should be discouraged in areas with a high concentration of significant archaeological sites or in areas of cultural or religious significance [3] to American Indians.
Cultural Resources	--	GL 123	Avoidance or protection measures should be the preferred method to prevent or minimize adverse effects to cultural resources listed in, nominated to, eligible for, or unevaluated for the NR.

Coconino National Forest Plan (USDA FS 2018)[4]

The recreational, educational, cultural, and scientific values of the archaeological sites on the Forest have been recognized as a recreational and scientific niche that the Forest can provide to the public. Understanding the scientific, cultural, and educational values of individual site types can provide a better basis for allocating them to management categories and for prioritizing them for scientific study, development, and preservation. Promoting and developing that niche, while protecting and respecting cultural and scientific values through research and conservation, is a goal of the heritage program of the Coconino NF.

Objectives for Heritage Resources

> Complete an analysis of at least three study units or site types during each 10-year period over the life of the plan to determine their rarity or ubiquity, potential significance for a range of archaeological questions, information gaps, and cultural values.

[2] Significance as defined by the National Historic Preservation Act and 36 CFR § 60.

[3] Sacred sites as defined in E.O. 13007, traditional cultural properties as defined in National Register Bulletin 38, traditional cultural purposes as defined in the 2008 Farm Bill Section 8102, Subtitle B

[4] The following can be found on page 91-96 of the CNF Forest Plan.

Guidelines for Heritage Resources

1. Primary archaeological site and survey records should be maintained and updated on the Coconino NF. Associated records may be shared and maintained at institutions that meet professional standards (such as 36 CFR 79, American Museums Association accreditation) and have research interests on the Forest.
2. Sites should be stabilized to preserve and maintain their information potential and significant values.
3. Unplanned user-created trails that lead to archaeological sites should be eliminated to protect sites from damage and looting.
4. Through consultation with those tribes who are descendants of the prehistoric people or with groups that have associations with the area in historic times, historic and prehistoric sites should be managed to prevent or minimize adverse impacts.
5. Collection of archaeological items should only occur when necessary to mitigate project impacts, when objects of notable scientific or educational value are encountered, or when there is a substantial risk that an item will be stolen if left on site.

Management Approaches for Heritage Resources

When conducting analysis on study units or site types, provide guidance on evaluating the significance of individual sites within that study unit or site type. Use these analyses to periodically update the Forest's Cultural Resources Overview.

The Cultural Resources Overview divides the Coconino into archaeological study units (geographic areas that are meaningful units of analysis with which to examine and interpret the prehistory of that area) and site types (such as field houses, flaked stone scatters, small pueblos, large pueblos, pit house clusters, and rock art that have cohesiveness and can be studied as individual classes and/or can be compared between archaeological study units). When planning and implementing property class surveys, give priority for identification and documentation to site types that are most subject to damage by expected project activities. Wooden structures and rock art, for example, can be more seriously damaged by fire-related activities than other site types.

Prioritize site stabilization and restoration work based on the relative importance, information potential, tribal concerns, and uniqueness of a site. Conduct and document monitoring after sites have been stabilized. Plan and perform maintenance before it becomes critical to the condition of a site.
Develop agreements with Forest-approved repositories to curate records and artifacts. Periodically inspect collections and repository facilities to ensure they continue to meet professional standards. Consider including curation costs for projects that include collection of artifacts.

Tonto National Forest Plan (USDA FS 1985)[5]

INVENTORY

[5] From Appendix H of the Plan beginning on page 251.

Objectives

1. Analyze the existing inventory coverage data for each management area to identify which portions of the area are completely surveyed, sample surveyed, or un-surveyed.

2. Conduct complete or sample surveys, as appropriate, for all un-surveyed portions of each management area according to the inventory priorities identified below.

3. Assess the existing cultural resource inventory to determine the adequacy of the site data it contains. Create a computerized inventory file and enter those sites for which adequate data are available or can be obtained. The initial computer file will follow USDA-Forest Service Southwestern Regional standards. Cross filing in a statewide inventory will be undertaken as time and funding permits.

Priorities

1. Project areas.

2. Areas currently experiencing high to moderate levels of use.

3. Areas subject to future development but for which no specific proposals have been formulated.

4. Areas known or predicted to contain a high density of cultural resources and/or NR eligible properties. Such areas without adjacent inventory data or predicted to contain sites of types considered to be under-represented in the existing inventory will have a higher priority than those for which greater quantities of data are available.

5. Areas known or predicted to contain a low density of cultural resources and/or properties not eligible for the National Register.

MANAGEMENT AND PROTECTION

Objectives

1. In each management area, manage all cultural resources so as to protect them from project impacts and other forms of disturbance until the appropriate inventory and evaluation processes have been completed. This involves administrative activities necessary to ensure adequate management and protection, such as administration of cultural resource permits, National Historic Preservation Act compliance documentation, and review of NEPA compliance documentation (Environmental Assessments, Findings of No Significant Impacts, Decision Notices and Environmental Impacts Statements).

2. Continue to manage and protect the area's cultural resources that are listed on the National Register of Historic Places and those determined eligible for nomination, as well as others as appropriate. Suitable management and protection measures will be developed on a case-by- case basis, but may include strategies such as avoidance, monitoring, data recovery, stabilization and enhancement.

3. Provide special protection to cultural resources being subjected to looting and/or vandalism. Appropriate protective measures should be developed in consultation with law enforcement personnel, but may include patrol, surveillance, signing, and/or fencing.

Priorities

1. Cultural resources on, or eligible for, the National Register of Historic Places as well as those that are potentially eligible but have not been evaluated, especially if they are subject to or likely to be subject to any form of disturbance.

2. Cultural resources that have not been evaluated but are unlikely to be subject to disturbance.

3. Cultural resources evaluated and determined not to be eligible, providing that further management and protection are deemed appropriate

EVALUATION AND NOMINATION

Objectives

1. Evaluate the existing inventory data for each management area to identify known cultural resources eligible for inclusion in the National Register of Historic Places.

2. Evaluate cultural resources located by inventory activity in each management area to identify those resources eligible for inclusion in the National Register according to the evaluation priorities identified below.

3. For each management area, nominate to the National Register those cultural resources determined to be eligible according to the nomination priorities identified below.

4. Initiate action to develop a Forest cultural resource overview, in order to provide an analytical framework for evaluation and nomination, as well as for management, protection, scientific study, interpretation and enhancement. (Overview should be completed within three years.)

Evaluation Priorities

(From Forest Service Manual 2361.23.2 – FSM 9/80 R-3 SUPP 49)

1. Properties threatened by proposed land management activities

2. Priorities undergoing deterioration due to vandalism, public use, erosion, or other forces.

3. Properties of known significance, e.g. those recommended for evaluation in Forest cultural resource overviews.

4. Other cultural resources.

Nomination Priorities

(From Forest Service Manual 2361.21 July 74, AMEND.62).

1. Archeological, historical, or other areas classified under [36 CFR 294.1 - suitable areas of National Forest land, other than wilderness or wild areas, that should be managed principally for recreation use]. (Wilderness or wild areas are managed to protect and preserve wilderness character rather than being managed principally for recreation use.)

2. Other sites, areas and objects that have substantial significance in the history or the prehistory of the Nation or area.

3. Other historic and archeological areas.

Plan Amendment No. 21: Cultural Resources, 5/3/1995[6]

For any proposed surface disturbing activity, the following standards will apply:

1. The Forest Service will comply with the National Historic Preservation Act (as amended) and the PA.

2. The standards specified in the PA will be followed. Where the settlement document does not specify standards, those in the Forest Service Manual and Handbook will apply.

3. During the conduct of undertakings, the preferred management of sites listed in, nominated to, eligible for, or potentially eligible for the National Register is avoidance and protection. Exceptions may occur in specific cases where consultation with the SHPO indicates that the best use of the resource is data recovery and interpretation.

4. Where resource management conflicts occur, the desirability of in-place preservation of cultural resources will be weighed against the values of the proposed land use. Preservation of heritage resources in place will become increasingly important under the following conditions:

-- where present methods of investigation and data recovery cannot realize the current research potential of the sites;

-- where the sites are likely to have greater importance for addressing future research questions than current ones;

-- where the cultural values derive primarily from the qualities other than research potential, and where those values are fully realized only when the cultural remains exist undisturbed in their original context(s) (e.g. association with significant historical persons or events, special ethnic or religious values, or unique interpretive values);

-- where site density would make data recovery economically infeasible, or require unattainable operating conditions.

Where preservation in place is important under these conditions, the Forest Service will give serious consideration to such options as project redesign, relocation, or cancellation. The procedures specified in the PA, 36 CFR 800, the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), and National Register Bulletin 38 will be followed in reaching a management decision.

5. Surface disturbing undertakings will be managed to comply with 36 CFR 800, the PA, NAGPRA, and Bulletin 38. All consultation responsibilities to the SHPO and tribes, before, during, and after an undertaking, will be followed. The area of an undertakings potential environmental impact will be surveyed for cultural resources and areas of traditional and/or religious use by Indian tribes. Inventory standards will be as specified in the settlement document[7] and in the Forest Service Handbook, and will be determined in consultation with the SHPO. Tribes will be consulted as appropriate.

Heritage resource management, including the formulation and evaluation of alternatives, will be coordinated to the extent feasible with the planning activities of the SHPO and with other state and federal agencies and tribes. This will be accomplished as follows: (a) consultation and meetings with such

[6] page 38 of the plan

[7]Its presumed that the settlement document refers to the settlement of a law suit that occurred in New Mexico in the 1990s regarding Section 106 compliance.

parties, (b) sharing of data, reports, plans, interpretations, and other documents, (c) coordination on National Register nominations, and (d) participation in the State cultural resources planning process.

All parts of the Forest not surveyed at the 100 percent level, and on which there is a likelihood that cultural resources exist, require more intensive inventory. Areas rated as highest priority for survey will be those that either (a) are expected to have high site densities, and/or (b) are important to understanding the historical or prehistoric occupations of the Forest. Such areas are identified in the CRAMP (Cultural Resources Assessment Management Plan). At a minimum, survey of such areas will be undertaken in conjunction with annual update training for para-professional archeologists.

The Forest Service, through the CRAMP, has developed a prioritized list and schedule for nominating eligible properties to the National Register of Historic Places (NR).

In consultation with the AZ SHPO, identified sites will be evaluated for eligibility for the National Register. Sites considered eligible will be assigned a priority for nomination. Sites not yet evaluated will be managed as if eligible, unless consultation with the AZ SHPO indicates otherwise.

The National Register nominating criteria are contained in 36 CFR 60.4. These are further refined through the identification of historic contexts in the CRAMP and overview.

The Forest Service will nominate at least two individual sites per year for every full- time professional employed in the Forests cultural resources management program.

Sites listed in or eligible for the National Register that need maintenance and/or stabilization are described in the CRAMP. Stabilization and/or maintenance plans will be developed for these sites and additional sites evaluated and given priority as the proposed work is accomplished.

DRAFT Plan Amendment

The Tonto National Forest Plan (USDA FS 1985) has a standard that directs management to achieve a "no effect" determination. This has since been determined to be an incorrect interpretation of "effect" and requires Plan revision to correct. A revised Forest Plan is not expected until 2019. An amendment specific to the 4FRI Rim Country EIS would recognize that there could be effects that are not adverse, and that there could be adverse effects that may or may not be fully mitigated.

The amendment maintains that part of the standard that addresses achieving a "no effect" determination and adds the words "or no adverse effect finding whenever possible" to acknowledge there may be situations where site avoidance is not possible or where adverse effects cannot be avoided: Table 1 displays current and amended Forest Plan language. New or edited text is displayed in bold text.

Table 1. Tonto NF Forest Plan Amendment for Cultural Resources

Current Tonto NF Forest Plan Direction	**Draft Forest Plan Amendment Language**
For any proposed surface disturbing activity, the following standards will apply:	
Sites listed in, nominated to, eligible for, or potentially eligible for the National Register will be managed during the conduct of undertakings to achieve a "No Effect" finding, in consultation with the State Historic Preservation Officer (Tonto NF Forest Plan, p. 38-1)	Sites listed in, nominated to, eligible for, or potentially eligible for the National Register will be managed during the conduct of undertakings to achieve a "No Effect" or "No Adverse Effect"

Current Tonto NF Forest Plan Direction	Draft Forest Plan Amendment Language
	finding whenever possible, in consultation with the State Historic Preservation Officer.

Affected Environment and Existing Conditions

Cultural resources, also known as Heritage resources or assets, encompass both the remains of the past as well as portions of the landscape important to modern-day cultures. Remains of the past are usually termed "sites" or historic properties and are frequently referred to as archaeological sites. Cultural resources are also of considerable importance to scientific researchers as well as the American public who seek to learn from the past. Also many present day traditional cultures identify with these sites as part of their cultural identity (Hanson 1999).

Within the project area, cultural resources range temporally from prehistoric times through the historic period and into modern times. Prehistoric sites can include rock art, cliff dwellings, pithouses, multiple room pueblos and artifact scatters. Historic resources may consist of logging railroad grades, trails and historic roads, cabins and homesteads, Forest Service administrative sites, Basque sheep camps, mining camps, Civilian Conservation Corps sites, and Native American shelters such as sweat lodges and brush shelters. Cultural resources also include Native American traditional use areas and places known as Traditional Cultural Properties (TCPs). These TCPs hold a central and important place in Native American culture. (see Appendix A Sample Strategy for a full cultural history and section ? of this EIS for discussion of Native American traditional uses and TCPs).

The existing condition for cultural resources is determined by the number of existing heritage inventories within the project area, in addition to the amount and/or types of resources, and cultural periods represented by those resources, that have been identified within the boundaries of the EIS. Table 1 was generated by the Apache-Sitgreaves and Coconino National Forests using their heritage GIS databases, while the Tonto used their hard copy heritage atlases.

Table 1. Cultural Resource Sites and Surveys within EIS Boundaries

Forest Name	Total Acres Previous Survey	Total Cultural Resources Recorded	National Register Listed Sites	NR eligible Sites	Unevaluated Sites	Site Previously Evaluated Ineligible
Apache-Sitgreaves	104,474	3,012	6	795	2,026	57
Coconino	97,900	946	2	148	774	22
Tonto	29,226	1100	2	388	621	91

Apache-Sitgreaves National Forest

The Rim Country EIS Area of Potential Effect (APE) includes 539,942 acres of the Apache-Sitgreaves National Forests (ASNF), [401,911 acres on the Black Mesa Ranger District (RD) (65% of the entire RD) and 138,031 acres on the Lakeside Ranger District (51% of the entire RD)]. According to current ASNF GIS data, within in the EIS boundaries, ASNF archaeologists have surveyed 90,929 acres of the 539,942-acre project area (16.8% of the EIS boundaries).

Three thousand and twelve (3,012) cultural resources have been recorded (1,694 on the Black Mesa RD and 1,318 on the Lakeside RD), of which six are listed on the National Register of Historic Places (National Register), 795 were determined eligible for inclusion on the National Register, 2,026 are unevaluated for eligibility and 27 have been determined not eligible for inclusion on the National Register. Most of the sites recorded are prehistoric or protohistoric in nature (n=2,532, 84.1%) followed by historic sites (n=360, 11.9%), 74 sites of unknown affiliation (2.5%) and multi-component sites with historic and prehistoric artifacts/features (n=46, 1.5%). Site types represent a full range of human occupation, from Paleoindian sites of the Pleistocene to a wide variety of historic period sites dating to 50 or more years ago.

Coconino National Forest

The Rim Country EIS APE includes 398,860 acres of the Coconino National Forest, (389,482 acres on the Mogollon Rim RD and 9,378 acres on the Red Rock Ranger District). Within in this area, Coconino National Forest archaeologists have surveyed 97,900 acres of the 398,860-acre project area (24.5% within the EIS boundary). Archaeologists have identified 946 cultural resources, of which two are listed on the National Register of Historic Places, 148 were determined eligible to the National Register, 774 are unevaluated for eligibility and 22 have been determined not eligible for inclusion on the National Register.

Most of the sites recorded are prehistoric in nature (n=738, 78%) followed by historic sites (n=189, 20%), multi-component sites with historic and prehistoric artifacts/features (n=15, 16%) and four sites of unknown affiliation. The majority of the prehistoric sites are lithic scatters (47%) and scatters with lithic artifacts and ceramics, (21%). Other prehistoric sites include sites with house features (field houses, pueblos, pithouses, cliff dwellings or other house features (20%), caves/rockshelters/cavates (3%), agricultural fields (3%), and rock art sites (4%). The 189 historic sites, include those associated with National Forest management (21%), logging or sawmills (7%), ranching (47%), historic trails or wagon roads (6%), mining (3%), military (3%), historic burials (3%) and 10% are trash dumps that may be related to one or several of these historic activities.

Tonto National Forest

The Rim Country EIS APE includes 290,090 acres on the Payson and Pleasant Valley Districts of the Tonto National Forest. Within in this area, Tonto National Forest Archaeologists have surveyed 29,226 acres of the 290,090-acre project area (10 % within the EIS boundary). Archaeologists have identified 1100 cultural resources, of which two are listed on the National Register of Historic Places, 388 were determined eligible for inclusion on the National Register, 621 are unevaluated for eligibility and 91 have been determined not eligible for inclusion on the National Register.

Issues/Indicators/Analysis Topics

Tribal Consultation

In accordance with the NHPA, E.O. 13175, the Region's PA and other regulations and policies, the Tonto Tribal Liaison conducted the government-to-government consultation for the Rim Country EIS. Consultation with Native American tribes was initiated at the onset of this project and will continue throughout its 10 to 20 year life span. The following Native American tribes have historical ties to the lands administered by the Apache-Sitgreaves, Coconino and Tonto National Forests. These tribes include Ft. McDowell Yavapai Nation, Gila River Indian Community, Havasupai Tribe, Hopi Tribe, Hualapai Tribe, Kaibab Band of Paiute Indians, Navajo Nation, Mescalero Apache Tribe, Salt River Pima–Maricopa Indian Community, San Carlos Apache Tribe, San Juan Southern Paiute Tribe, Tonto Apache Tribe, White Mountain Apache Tribe, Yavapai–Apache Nation, Yavapai–Prescott Indian Tribe, Pueblo of Acoma, and Pueblo of Zuni. Eight Navajo Chapters in proximity to the project area – the Alamo, Bodaway/Gap, Cameron, Coalmine Canyon, Dilkon, Lechee, Leupp, Ramah, Tolani Lake, and To'Nanees'Dizi Chapters – and the Dine Medicine Man's Association are also included.

The following outlines the tribal consultation that has been conducted to date:

4FRI – Rim Country Project
Tribal Consultation Summary – Scoping Comments

Nanebah Nez – Tribal Relations Lead (Rim Country)
Tribal Relations Staff: Mike Lyndon – Kaibab NF, Craig Johnson – Coconino NF, Esther Morgan/Tim Gilloon – Apache-Sitgreaves NF & Nanebah Nez – Tonto NF

August 2016 and Ongoing

Date of Meeting	Tribes Attending	Meeting Location	Comments/Concerns
08/16/2016	Pueblo of Zuni, Yavapai-Apache Nation, San Carlos Apache Tribe, Tonto Apache Tribe, White Mountain Apache Tribe	Payson, Arizona	• Tribes desire "pre-reservation conditions" for the forests. • Tribes are concerned with long term access to forest resources particularly forest products which are traditionally utilized. • Mechanical treatment should be culturally/tribally monitored to prevent destruction of traditional cultural properties and archaeological sites • Tribes (WMAT & SCAT) should be notified prior to rX burns. Smoke effects the elderly in tribal communities. • San Carlos would like logging materials for their mills • There should be a TCP inventory conducted

			• There should be a harvesting/subsistence site inventory • Hot fires destroy the sumac berry which is important to the Apaches • Mechanical thinning can destroy tobacco which is important to the Apaches
8/18/2016	Salt River Pima-Maricopa Indian Community and Gila River Indian Community	Sacaton, AZ	• Concerned about wooden and other fire sensitive archaeological sites. For example hogans with wood implements, cradle board scarred trees
11/21/16	Navajo Nation	Window Rock	• There have been smoke impacts to Bitter Springs and Cedar Point. Smoke is not good for the elderly. • Fire from lightning struck trees is harmful to Navajo people. There may be a need for medicine men to be involved with these fires that are encouraged and maintained by FS.
11/22/16	Pueblo of Zuni	Zuni, NM	• Zuni YCC crews are looking for work and work like to be involved. • Springs are Zuni TCPs • Zuni would like to participate in cultural plant inventory and spring inventories (specific to Kaibab)
11/29/16	Fort McDowell Yavapai Nation & Yavapai-Prescott Indian Tribe	TNF Headquarters	• Request continued information sharing.
12/9/16	Mescalero Apache Tribe San Carlos Apache Tribe Tonto Apache Tribe	Payson, AZ	• Herbicide useage should be signed so tribal members don't collect plants in these areas. • agave parryi, acorn oaks, piñon, and cattails are important
12/13/16	Pueblo of Zuni	Zuni, NM	• Zuni has crews that could assist in implementation. They also have cultural resources survey crews.
12/30/16	Salt River Pima Maricopa Indian Community Gila River Indian Community	TNF Headquarters	• Gila River has thinning crews that could potentially assist in implementation • Salt River could provide cultural sensitivity training for contractors
01/11/18	Kaibab Band of Paiute Indians	Pipe Springs, AZ	• Tribe is interested in developing a SPA to provide thinning crews.

03/08/18	Pueblo of Zuni	Zuni, NM	• Pueblo of Zuni President signed the Tribal Crews Master Participating Agreement (MPA)
04/03/18	Havasupai Tribe, Hualapai Tribe, Hopi Tribe, Pueblo of Zuni	Kaibab NF Field Visit	• Discussed project development under the MPA. • Tribes need timbers and other forest products for traditional uses.
04/27/18	Gila River & Salt River Pima-Maricopa Indian Communities	TNF Headquarters	• Gila River would like to participate in forest restoration activities Salt River would be interested in providing input to the Citizen-Science iNaturalist Program
05/01/18	Tonto Apache Tribe, San Carlos Apache Tribe, Yavapai Apache Nation, White Mountain Apache Tribe	Twin Arrows, Flagstaff	• Apache Tribes are very interested in the restoration, protection, and sustainability of emory oak trees. They are willing to assist in designed management actions. • Discussed Citisci iNaturalist project implementation • Discussed SPA development under the MPA
05/03/18	Hopi and Zuni	Twin Arrows, Flagstaff	• Tribes are interested in assisting in forest restoration activities. Tribes use the forest to access timber and forest products not available on their reservations. • Discussed Citisci iNaturalist project implementation • Discussed SPA development under the MPA
05/07/18	Havasupai Tribe	Supai, AZ	• Discussed MPA and possibility of Havasupai Water Resources assisting with water restoration projects
05/14/18	San Carlos Apache Tribe & White Mountain Apache Tribe	Payson Ranger District	• Strategy meeting to discuss how to move forward to partner in Forest Restoration Activities

Assumptions and Methodology

The primary assumption is that the removal of fuel from archaeological sites and improving or decommissioning roads is a benefit to cultural resources. This activity can protect cultural resources from the effects of extremely hot, highly destructive wildfires by removing fuel from around and off of archaeological sites. It could implement protection measures to archaeological sites by decommissioning roads that go through sensitive sites. It may also reduce the threats to archaeological sites from off-road driving by improving rough, impassible roads. Thus encouraging drivers to remain on roads rather than driving cross- country to avoid bad spots in roads. However the methods for accomplishing these tasks such as mechanical thinning or ripping roads, has the potential to adversely affect cultural resources.

The secondary assumption is that cultural resources will be present at the proposed spring, riparian or stream restoration locations. Cultural resources are frequently found in association with water sources such as springs, streams and riparian areas. Water sources would have been exploited prehistorically and during historic periods. A reliable spring, for example, would likely have been developed to supply stock grazing, logging operations or farming.

The final assumption is that all activities proposed under the Rim Country EIS will meet the criteria of a No Adverse Effect determination as defined in the PA and/or 36 CFR 800.6 where appropriate.

In consultation with the AZ SHPO, the Forests are going to rely on multiple guidance documents and strategies to assist in reaching a No Adverse Effect determination. The primary guidance will be Appendix J of the PA. Appendix J outlines the consultation protocols and strategies for implementing Large-Scale Fuels Reduction, Vegetation Treatment, and Habitat Improvement Projects.

To supplement Appendix J, in consultation with the AZ SHPO and tribes, the Forests created a sample survey strategy specifically for vegetation projects that will involve mechanical treatment (Morgan et al 2017). Appendix J provides guidance for mechanical treatment. However it does not distinguish between the various types of mechanical treatment options-feller buncher vs agra-ax- nor does it take into account existing site inventory data or identified high and low site densities area. A model was created using Terrestrial Ecological Units (TEU) strata and known site densities within the project area. The model, amount of existing inventory within a task area and the type of proposed mechanical treatment will all be taken into account when determining the amount of inventory necessary and any standard mitigation measures that need to be implemented to meet the criteria of No Adverse Effect.

The PA will guide the analysis for the remaining activities proposed in the Rim Country EIS. The one exception will be road improvement and decommissioning. Some Forest roads are known to cross archaeological sites and they often have artifacts and cultural features exposed in the road beds. Improving or decommissioning roads usually involves some level of mechanical work such as grading or ripping road beds. The Forests, in consultation with the AZ SHPO and tribes, developed a road plating protocol. This protocol outlines procedures for "plating" or covering the portions of sites within roads beds that have remaining features and/or intact cultural deposits. This will help to protect intact cultural remains in the roads from blading or other types of maintenance or decommissioning activities.

Phased Section 106 Compliance

Because of the size of the undertaking, implementation will be phased over several years. Appendix J, reviewed by the AZ, NM, TX and OK SHPOs, the ACHP and tribes, allows for the phasing of the section 106 compliance (See Appendix B). Appendix J and the Rim Country Sampling Strategy developed in consultation with tribes and the AZ SHPO describes the methods to be used to achieve a No Adverse Effect determination for the Rim County analysis as a whole, while providing a strategy for a phased Section 106 evaluation for individual task orders.

Individual task orders, or undertakings, will be inventoried when each specific project area is identified. A Section 106 report, will be produced for each proposed individual undertaking, and all consultation with the AZ SHPO and appropriate tribes will be completed prior to implementing the task order.

Summary of Alternatives and Resource Protection Measures (Design Features, Best Management Practices, Mitigation and Conservation Measures)

The PA and Appendix J include lists of mitigation measures that have been pre-consulted on with the ACHP, AZ, NM, TX, OK SHPOs and Tribes. Therefore these measures can be implemented during the field analysis phase. Additional mitigation measures may be recommended and reviewed by the AZ SHPO when consulting on the individual task orders. The following table lists the general design features and best management practices (BMPs) that can be utilized as part of the analysis of the individual task orders.

Design Feature	Description	Forest Plan Compliance	Specialist Recom-mendation	Purpose
Cultural Resources/Tribal Relations				
CT1	Minimize effects on archaeological sites from wildland fires by implementing the agreed-upon standard site protection measures from in Appendix J of the PA or any additional mitigation measures recommended in consultation with the AZ SHPO and tribes.	X		Regulatory requirement. Compliance with NHPA and the PA.
CT2	All activities will comply with NHPA, as appropriate. Effects to cultural resources would be determined in consultation with the SHPO and other consulting parties. Potential effects would be addressed through site avoidance strategies and implementing the site protection measures listed in Appendix J of the PA and in the 4FRI heritage strategy and Section 106 clearance report.	X		Regulatory requirement. Compliance with NHPA and PA
CT3	Consult with Native Americans, particularly when projects and activities are planned in sites or areas of known religious or cultural significance.	X		Regulatory requirement. Compliance with NHPA, AIRFA, PA, EO 13007, EO 13175, and other applicable Executive

Design Feature	Description	Forest Plan Compliance	Specialist Recom-mendation	Purpose
				Orders and legislation.
CT4	Eligible, or potentially eligible, cultural resources would be managed to achieve a "no effect" or "no adverse effect" determination whenever possible, in consultation with the SHPO and ACHP (36 CFR 800).	x		Regulatory requirement. Compliance with NHPA and PA.
CT5	Monitoring during and after project implementation shall occur to document site protection and condition.	x		Compliance with PA (Appendix J).
CT6	Proposed treatment activities and schedules would accommodate tribal traditional and ceremonial uses.	x		Compliance with the Food, Conservation, and Energy Act of 2008 (Public Law 110-234)
CT7	In accordance with regulations (43 CFR 10) governing application of the NAGPRA, if human remains, funerary objects, sacred objects, or objects of cultural patrimony are inadvertently encountered, operations in the area must immediately cease and the Forest Archaeologist notified. The Forest will work to initiate consultation with the affected tribe(s) to implement any requirements listed in NAGPRA and the PA and to develop a plan to mitigate the effects to the find.	x		Regulatory requirement. Compliance with NAGPRA, NHPA and PA. Forest Plan compliance.
CT8	Should any previously unidentified cultural materials be discovered during project implementation, work must cease immediately and the Forest	x		Regulatory requirement. Compliance with NHPA and PA.

Design Feature	Description	Forest Plan Compliance	Specialist Recom-mendation	Purpose
	Archaeologist must be contacted to initiate the consultation process as outlined in the Advisory Council on Historic Preservation Regulations (36 CFR Part 800.13).			Forest Plan compliance.
CT9	Contracts, permits, or leases that have the potential to affect cultural resources shall include appropriate clauses specifying site protection responsibilities and liabilities for damage.	x		Regulatory requirement. Compliance with NHPA and PA. Forest Plan compliance.
CT10	Fines, etc., for the costs of restoration and repair resulting from breaches of contracts, permits, or leases that cause inadvertent or intentional damages to cultural or tribal resources shall be strictly enforced.	x		ARPA, Site protection
CT11	Locate, record, and evaluate the General George Crook and other significant historic trails within the project area well before implementation.	x		Regulatory requirement. Compliance with NHPA and PA.
CT12	Maintain historic and scenic integrity of the General George Crook Trail and other historic trails, roads and National Recreation Trails.	x		NHT and NRT requirements, Recreation Opportunity Spectrum
CT13	Maintain historic and scenic integrity of NR eligible historic roads, including the preservation of associated historic features, tread width, curve radii, and other features that contribute to the National Register eligibility of the historic roads.	x		Site protection, ARPA (prevention of looting)

Design Feature	Description	Forest Plan Compliance	Specialist Recom-mendation	Purpose
CT14	Plate over NR eligible and unevaluated sites located within roads that will be maintained or reconstructed	x		NHPA compliance, 4FRI Rim Country Site Plating protocol
CT15	Coordinate with Forest cultural resource specialists to design and implement projects (or dont implement projects) located in areas of very high site density.	x		Site protection, ARPA (prevention of looting)
CT16	Culturally modified trees such as blazed trees, lookout trees, phone line trees, arborglyphs, peeled trees, etc.) will be avoided. Protection measures may include removing ladder fuels around the trees by hand, establishing buffer zones to keep equipment from damaging trees or affecting root systems, etc.	x		Regulatory requirement. Compliance with NHPA and PA.
CT17	Roads to NR eligible and unevaluated sites will be identified to be closed and will be closed immediately after implementation is completed.	x		Regulatory requirement. Compliance with NHPA and PA.
CT18	All rock pit locations will be surveyed for cultural resources. All identified cultural resources that are considered eligible for the purposes of Section 106 of the National Register of Historic Places within or adjacent to the rock pit boundary shall be flagged prior to implementation. Flagged cultural resources shall be fully avoided. In addition to flagging, rock pit extraction areas shall include fencing along the pit boundary to minimize the potential for indirect impacts to cultural	x		Reduces disturbance footprint, protects cultural and historic sites, and retains seed sources for eventual reestablishment of residual plant cover, potentially enhancing fruit, seed, and plant production.

Design Feature	Description	Forest Plan Compliance	Specialist Recom-mendation	Purpose
	resources outside of the pit boundary where applicable.			
CT 18	Minimize effects to archaeological sites from wildland fires by implementing the agreed-upon standard site protection measures from in Appendix J of the PA, or any additional mitigation measures recommended in consultation with the AZ SHPO and tribes.	x		

Environmental Consequences

Alternative 1 – No Action

Existing fuels in and around archaeological sites would continue to increase. This may result in more frequent and intense wildfires which could result in site and artifact damage such as spalling of rock art and cracking of artifacts. Fire suppression actions, particularly bulldozer operations, may damage or completely destroy surface and subsurface (pit houses/kivas) archaeological sites resulting in the loss of those resources and their research potential.

Soil erosion due to uncharacteristic wildfires could have both direct and indirect effects on heritage resources. Rain and snow melt could cause channels to form within denuded sites, or mud slides from nearby slopes could deposit soil and debris within site boundaries leading to the loss of data potential and the characteristics that would make a heritage property eligible for the National Register of Historic Places.

Archaeological sites located within open grass lands would be affected by an increased number of trees growing within the site boundaries. The trees and their root systems may displace surface and subsurface artifacts and features. Also the trees would increase the amount of fuel on the sites. This may result in effects from intense wildfires.

Forest system roads that cross archaeological sites would continue to affect the sites by degrading cultural deposits and features within road beds located within site boundaries. Also when roads are not well maintained, users may drive off existing roads to avoid "bad spots" and could affect cultural sites adjacent to the roads.

No action may also result in the possible reduction over time of pre-European settlement adapted native plants, some of which have been collected since historic times by Native Americans for food and medicine. Additionally, springs, seeps and riparian areas are important locations to Native Americans and

other members of the public and increasingly overstocked forests may have some effect on those historic water sources.

Effects Common to All Action Alternatives

All of the alternatives are recommending a substantial amount of ground disturbance particularly mechanical treatments whether it be thinning trees, grassland restoration, blading in new temporary roads, maintaining existing roads or decommissioning roads. Other activities such as stream and riparian restoration, and the installation of barriers around springs, aspens and other native trees also may include ground disturbing activities. Riparian areas and water sources like streams and springs tend to be locations where the presence of cultural resources can be reliably predicted. Therefore all of these activities have the potential to adversely affect cultural resources. Effects could include rutting, erosion, dislocation or breakage of artifacts and features and destruction of sites and site stratigraphy.

Prescribed burning also has the potential to affect sites. If the burning is low to moderate in heat intensity, and there is little fuel on the sites, most sites located within the analysis boundary would be minimally affected, if at all, by burning with the exception of sites that include wood elements and/or rock art. Sites within the project area with a significant amount of fuel in a prescribed burn area could be affected by heat damage in the same manner as a wildfire if the fuel is not removed prior to burning. Effects from heat damage would include breaking, pocking and spalling of ground stone tools and architectural features. Excessive heat can alter obsidian hydration rinds, destroying their dating potential and the associated loss of scientific information. Effects to structural components such as rock walls or rock faces include discoloration, cracking, and spalling, making the rocks susceptible to accelerated deterioration. There is also a potential for effects from soil erosion due to the removal of vegetation. Rain and snow melt, for example, could cause channels to form within denuded sites. Mud slides from nearby slopes could deposit soil and debris within site boundaries, leading to the loss of data potential and the characteristics that would make a heritage property eligible for the National Register of Historic Places. The majority of the effects listed above can be mitigated through project design, avoidance, removing fuel from sites prior to project implementation and/or implementing the site protection measures listed in Appendix J.

Thinning and prescribed burning should reduce unnatural fuel loading around and within the boundary of NR listed or eligible heritage resources. Uncharacteristic fire behavior should also be reduced which would help to prevent extensive heat damage from future wildfires. There would be less need for fire suppression activities during a wildfire, consequently less of a threat from ground disturbing activities like bulldozer fire-line construction.

Initial reduction of heavy fuels may lead to an increase in site visibility, public visitation, and possible vandalism. Those issues are mitigated through management actions that include project specific as well as long term monitoring. Initial entry prescribed burns should be periodically revisited and burned to reduce natural fuel accumulations, and archaeological site monitoring is part of that process. Possible road decommissioning can also assist in limiting access to some archaeological sites, thus minimizing post burn visibility and visitation issues at those sites.

The proposed temporary road construction, road maintenance and road decommissioning, as noted above, do have the potential to affect cultural resources. The PA includes mitigation measures that would help protect cultural resources affected by Forest system roads identified for maintenance or decommission. The locations of temporary roads would be inventoried prior to implementation and any potential effects to sites would be mitigated through avoidance or a substantial project redesign. Decommissioning activities, if contained within the road beds and not within site boundaries, should have no effect on

cultural resources. In those cases where road maintenance or decommissioning may occur within NR listed or eligible cultural resources, a site plating strategy has been developed in consultation with the AZ SHPO and tribes[8]. The protocol includes mitigation measures to protect any existing cultural deposits or features present within the road beds or along road cuts.

Restoration activities for grasslands, riparian area and streams do have the potential to effect cultural resources. Grasslands tend to contain low densities of archaeological sites. Some restoration activities, such as the use of agra-ax to remove encroaching trees, though a mechanical treatment, are known to disturb little of the ground surface. Therefore grassland restoration activities are less likely to negatively affect cultural resources. Where sites are present, mitigation measures listed in the PA and Appendix J can be implemented.

Springs, streams and riparian areas are known to be very sensitive for the presence of cultural sites and culturally important plants. Restoration activities that are highly ground disturbing would affect cultural resources. The PA lists mitigation measures that can be implemented to minimize impact to cultural sites.

Project implementation may affect some Native American uses as tribal members commonly access Forest lands for ceremonial activities and to gather forest products. Access concerns can be addressed through on-going consultations between the Forests and Native American groups.

There is the possibility that cultural resources will be discovered during project implementation. These inadvertent discoveries will be handled, in consultation with the AZ SHPO and tribes, following the guidance in Appendix J of the PA and 36 C.F.R 800.12., if appropriate.

Effects Unique to Each Action Alternative and Differences Among Them

The alternatives propose essentially the same activities ranging from various mechanical treatments, restoration and various types of road work. The major differences involve the proposed quantity of each activity being performed. From a cultural resources stand point, there are no effects that are unique or different between the alternatives. Effects to cultural resources are highly dependent on the proposed activity, its location, and the likelihood of the presence or absence of cultural resources within the proposed treatment area. Therefore, mechanically thinning 899,340 acres vs 474,930 acres only matters in that fewer acres proposed for mechanical treatment means less threat to cultural resources from being affected by this activity. However, it also means less fuel removed, thus less protection to cultural resources from the effects of high intensity wildfires.

Effects from Rock Pit Use and Expansion

Approximately nine existing rock pits on the Coconino NF are being proposed for use within the Rim Country project area. Those pits are:

Oak Grove
Turkey Knob
Brushy Knoll
Snafu
Macks
Salmon Lake
Cinch Hook
Lockwood

[8] The region is in the process of working on adding this strategy as a protocol to the R3 PA. Until that time, the AZ SHPO agreed that this platting strategy can be used within the 4FRI area.

Buck Butte

On the Apache-Sitgreaves NF, 11 sites are proposed for use. They are:

34T
213
Pias Farm
115
717E
Promontory
Carr Lake
Brookbank
Borrow
Cottonwoods Wash

The pits are proposed to be used as a source of gravel for various road maintenance activities. Their access roads may undergo some level of maintenance and the pits may be expanded in various directions to a maximum of 500 feet to increase their capacity to yield material. The rock pit locations on the Coconino were evaluated for Section 106 as part of the Rock Pits EA (USDA 2016). Unlike the pits on the Coconino, pits on the Apache-Sitgreaves have not been evaluated for Section 106 compliance beyond their current operations. According to the Forest's cultural resource database, Carr Lake, Brookbank, Borrow and Cottonwoods Wash pits all have cultural resources that would need to be mitigated before expanding the pits.

Proposed rock pit operations and expansions have the potential to affect cultural resource sites adjacent to proposed rock pit and access road locations. Erosion by mass wastage, slope wash, and wind over many years, can strip cultural deposits from archaeological sites, remove or displace artifacts, and undermine historical structures. Ground disturbances adjacent to cultural resource sites may accelerate erosion by damaging vegetation, loosening stable soil surfaces, and/or compacting soils and thereby promote surface runoff. Vehicle tracks tend to channel surface runoff causing down-cutting and increased soil erosion. These effects are expected to be avoided at cultural sites near rock pits through pit expansion design and avoidance measures such as erecting temporary fences around sites during operation periods.

It is possible that increased truck traffic to and from proposed rock pits could result in indirect erosion effects on a small number of sites that occur adjacent to access roads. Keeping these roads well maintained would be expected to limit these effects.

The risk of unauthorized collection of artifacts would increase due to the presence of project personnel in areas where the locations of heritage resource sites are clearly marked. Unauthorized removal of materials from heritage resource sites could result in the loss of objects with cultural importance to Native American groups, or of artifacts needed to determine the age and nature of the occupation at prehistoric sites. This would be mitigated by requiring that sites identified near the pit operation areas are recorded in detail, than monitored after the operations are completed.

Effects from Use of In-woods Processing and Storage Sites

Twelve locations have been identified as potential processing and storage areas within the Rim Country project area on the Coconino and Tonto National Forests. The following table shows the proposed locations and current cultural information.

Name	Size	Forest	Current status of inventory
137 / 96	141.8	Coconino	Minor previous survey, low probability, Historic Trail present
139 / 9729D	15.1	Coconino	Some survey, site located in or near proposed area
145A / 9615X	14.3	Coconino	Mostly surveyed, no sites, low probability
294 / 294D	81.1	Coconino	Half surveyed, no sites, low probability
81 / 81E	9.1	Coconino	Partially surveyed, sites located nearby, high probability
9364L / FH3	40.5	Coconino	No survey, several sites nearby, moderate probability
9731G / Hwy87	6.0	Coconino	No survey, very high probability
Snafu	10.7	Coconino	100% surveyed, one site near but not in. Has sinkhole
117 / 1321	3.8	Tonto	Not surveyed
582 / Hwy87	4.6	Tonto	Mostly surveyed
74 / 64	5.9	Tonto	Not surveyed, multicomponent site 04-1533 located in area. Unevaluated
288/2781	unknown	Tonto	Unknown
3238 / 512	23.5	Tonto	100% surveyed
609 / 1938	5.3	Tonto	Not surveyed, prehistoric multi-room compound site 05-188 located in area. Unevaluated.

The potential storage and processing areas located on the Coconino NF are within the project area for the Cragin Watershed Protection Project EA. The areas where they are located were assessed as part of the Cragin heritage evaluation. Mitigation measures listed in the EA parallel those listed in the PA and the Appendix J and will be implemented prior to project implementation. If the proposed processing and storage areas are selected for use, the Mogollon Rim Ranger District Archaeologist would review the

existing inventory for that location and would insure that mitigation measures listed in the Cragin EA are implemented, if needed.

The potential locations on the Tonto NF would likely be utilized for task orders or contracts in these areas. The evaluation for all of the processing and storage locations, if evaluated as a part of a task order, would follow the processes outlined in Appendix J. Otherwise the guidance within the PA would be used. Proposed mitigation measures would be implemented prior to the areas being used. With the implementation of standard mitigation measures, there should be no adverse effects to cultural resources due to the use of these locations as storage and processing areas.

Effects from Forest Plan Amendment(s)

Three plan amendments were added to the Tonto National Forest Plan. They removed language restricting mechanical equipment on slopes of over 40 percent, amended Plan language and components to align with the Mexican Spotted Owl Recovery Plan, and redefined the treatment for ponderosa pine vegetation types. Of these three amendments, removing restrictions for mechanical equipment on slopes of less than 40 percent has the most potential to affect cultural resources and the methods for conducting Section 106 analysis.

Sensitive cultural resources such as rock art and rock shelters tend to be located on 40 percent or greater slopes of small hills, rock out-croppings and mountain slopes. However, because steeps slopes are typically not treated mechanically, Appendix J includes provisions that would allow for exempting slopes 40 percent or greater from intensive archaeological inventory. The Rim Country alternatives will include treatment of slopes up to 40 percent. This increases the likelihood of impacts to the types of cultural resources found in those locations. It also means that the archaeological analysis will need to include an intensive inventory of the steep slope treatment locations.

Cumulative Effects Analysis

No Action

If the proposed large scale, landscape level forest health project does not occur, there would still be some serious cumulative effects to heritage resources. High intensity wild fires and the construction of fire breaks using bulldozers during a wild fire could severely damage sites. Wild fires could also sterilize the soil or completely remove ground fuels making the sites vulnerable to soil erosion. Also, because sites are more visible after a fire, they are much more susceptible to vandalism. Soil erosion from dry channels that are within or adjacent to sites could continue to affect a site's cultural stratigraphy and displace much cultural material. Roads through sites would continue to degrade cultural deposits and features. Trees would continue to encroach into grass lands and displace artifacts and cultural deposits within sites.

Effects Common to All Action Alternatives

Cumulative effects from mechanical treatments, temporary road construction, and other ground disturbing activities, as well as effects caused by prescribed burning, would be mitigated using site protection measures identified in the PA, Appendix J, the Rim Country Sample Survey Strategy and the Site Plating Strategy. These include archaeological monitors during mechanical activities, keeping ground disturbing activities out of site boundaries by flagging and avoiding the sites, and post prescribed burn site monitoring to assess the effects of the low intensity burns. Covering cultural deposits and features in road beds within cultural sites prior to maintenance activities or during decommissioning would protect buried cultural deposits and features. Also, well maintained roads will encourage the public to remain on roads and deter cross country travel which can damage sites located near roads. Because all ground disturbing

and prescribed fire undertakings go through the Section 106 review process, and identified potential effects would be mitigated, the overall cumulative effects from these undertakings should be minimal. Therefore there should be little cumulative effects to cultural resources as a result of the activities proposed in this EIS.

There is a possibility of cumulative effects with regards to archaeological site vandalism resulting from increased visibility once the project is implemented. However, the management practice of implementing low to moderate intensity prescribed fire typically does not sterilize soil or completely remove ground fuels as does a high intensity wildfire. Low intensity fires also tend to leave some trees in place that will eventually cover the surface with a recurring needle cast. Sites are also periodically monitored both during project implementation as well as for NHPA Section 110 purposes by agency and volunteer personnel. Proposed road closures would also reduce public access to some of these areas.

The likelihood of erosion on cultural resources is also minimal. Reducing fuel loads and implementing low to moderate intensity prescribed fires does not cause soil sterilization or hydrophobic soils like high intensity wildfires. As noted previously, low intensity prescribed fires leave some vegetation in place and re-vegetation occurs soon afterwards if soils are not sterilized. However, as implementation occurs, archaeologists would monitor for erosion concerns, examining sites in the project areas, especially focused on slopes, drainages, and other high probability areas where cultural resources maybe present.

The proposed restoration activities in grasslands, riparian, streams and seeps would also have a very limited ability to cause cumulative effects. All of these activities can easily be modified to minimize effects to cultural resources through avoidance or prescription modification. In the case of grasslands, the physical removal of encroaching trees and other fuels would have the added benefit of protecting sites from the effects of wildfire.

Irreversible and Irretrievable Commitments of Resources

Cultural resources are non-renewable resources. The actual identification and analysis of the cultural resources within the project area will be accomplished when the individual task orders are identified. The majority of cultural sites that are likely to be encountered during implementation of this EIS are not likely to be committed for the purposes of recreation, tourism or public interpretation. Therefore there is not likely to be a loss of future options or loss of production as a result of this EIS.

Unavoidable Adverse Effects

Appendix J of the PA and the sampling strategy developed for the Rim Country EIS includes guidance and standard mitigation measures. If the measures are implemented as recommended, the proposed undertaking within this EIS should result in no adverse effects to cultural resources. Therefore there should be no unavoidable adverse effects to cultural resources as a result of this EIS.

There is a potential for the discovery of new sites and human remains during project implementation. These are typically cultural deposits that were not detected on the surface during the initial project analysis. The PA and 36 CFR 800.12 include guidance on how to address these situations. Implementation of this guidance is done in consultation with the AZ SHPO and tribes, if appropriate, and an effort is made to minimize effects to the discovery.

Short-term Uses and Long-term Productivity

The activities recommended within the Rim Country EIS will have limited effect on long or short-term productivity in relationship to cultural resources. Cultural resources are non-renewable. Soil erosion on or near cultural resources due to fire or flooding is a concern. However, as noted in the Environmental

Consequences section, the majority of potential long or short-term effects to cultural resources from the activities propose in the EIS can be mitigated through a variety of standard mitigation measures, design features and BMPs. Therefore the likelihood of effects to long or short-term productivity in relationship to cultural resource is extremely low.

Other Agencies and Individuals Consulted

Arizona State Historic Preservation Office

List of tribes from Noni.

Acronyms

APE – Area of Potential Effect

A-S- Apache-Sitgreaves National Forest

AZ SHPO- Arizona State Historic Preservation Office or Officer

ACHP- Advisory Council on Historic Preservation

BMPs- Best Management Practices

CNF- Coconino National Forest

CRAMP-Cultural Resources Assessment Management Plan

EA-Environmental Analysis

EIS-Environmental Impact Statement

KNF-Kaibab National Forest

NAGPRA- Native American Grave Protection and Repatriation Act

NHPA- National Historic Preservation Act

NR- National Register of Historic Places

PA- Region 3 Programmatic Agreement

TNF-Tonto National Forest

Glossary

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Finalizing Your Report

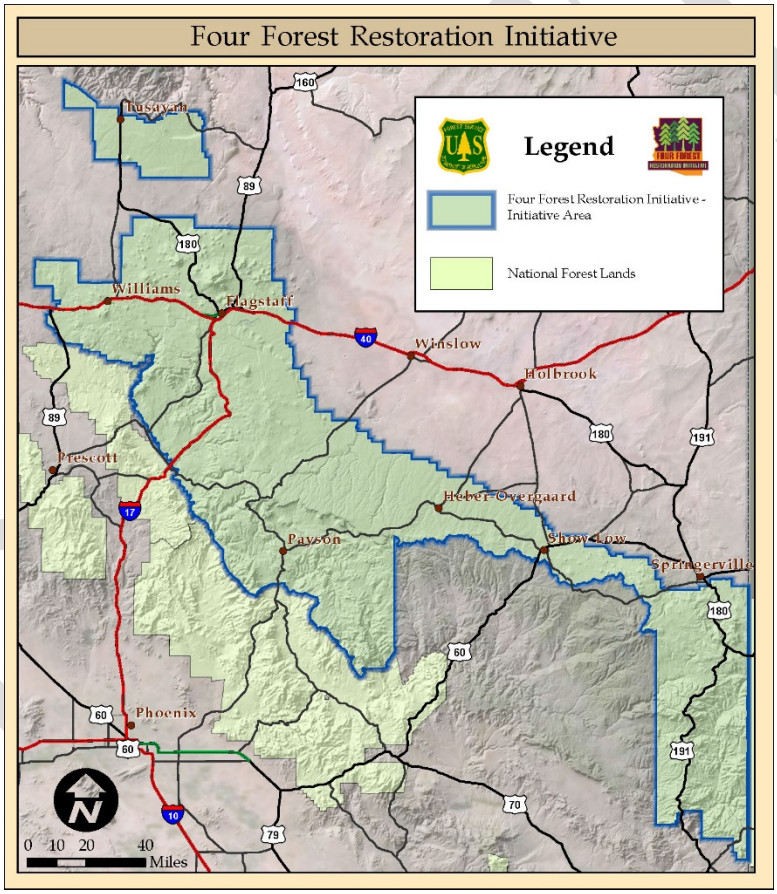
- Make sure pages are numbered and there is a document title in the header or footer.
- Sign and date your original report and put it in the project record. Keep a copy in your resource files. Supply a signed and electronic copy to the writer/editor along with a copy of the data, field notes, correspondence, any modeling calculations, e-mails, maps, and other information used in the report. The final signed and dated report should be used with the EIS, not a draft.
- If a specialist report is revised in response to public comment or objections, it should be labeled as such with a new date and signature. This review of public comment is an opportunity to analyze criticisms of the report prior to the project being final, and to fix any problems or vague discussions in the report. Coordinate with interdisciplinary team members so no conflict arises with other responses. The original should always be kept in the project record.

Appendix A

Rim Country Environmental Impact Statement
NHPA Compliance Sample Survey Strategy for Mechanical Treatments
Coconino National Forest Report#
Tonto National Forest Report#
Apache-Sitgreaves National Forest Report #

Esther Morgan, Denise Ryan, Mark Swift, Peter Piles,
Kristina Hill, Chris Barrett, David Johnson and Margaret Hangan

2017



Contents

Abstract

The Four Forest Restoration Initiative (4FRI) is a planning effort designed to restore forest resiliency and ecosystem function in ponderosa pine forests across four National Forests in Arizona including the Coconino, Kaibab, Apache-Sitgreaves, and Tonto National Forests. In 2015, the Record of Decision for the first 4FRI environmental impact statement (EIS) for the northern portion of the Coconino National Forest (NF) and the Kaibab NF was signed. The Rim Country EIS continues the ecosystem restoration effort on about 1,240,000 acres on the Mogollon Rim and Red Rock Ranger Districts of the Coconino NF, the Black Mesa and Lakeside Districts of the Apache-Sitgreaves NF, and the Payson and Pleasant Valley Districts of the Tonto NF.

This report outlines the Heritage Strategy for the Rim Country EIS project, like the first 4FRI strategy (Gifford 2011), this document identifies a large-scale survey strategy for proposed restoration treatments for that involve mechanical thinning, predicated on the Region 3 Amended Programmatic Agreement and its Appendix J: Standard Consultation Protocol for Large-scale Fuels Reduction, Vegetation Treatment and Habitat Improvement Projects. Section 5 of Appendix J states that " a forest or forests may opt to develop a forest-wide survey strategy for WUI and other large-scale fuels reduction, vegetation treatment, or habitat improvement projects in consultation with the SHPO and thereby further eliminate the need for individual project notifications for sample surveys." Because the activities that are proposed within the Rim Country EIS will in general be consistent throughout the length of the implementation period, the sample survey strategy in this document is proactively being developed in consultation with the Arizona State Historic Preservation Office (AZSHPO) and tribes who have a traditional relationship with the Rim Country EIS project area. This will allow forest archaeologists to implement this survey strategy without having to pre-consult with the AZSHPO. The strategy, as developed in this document, may not work for every situation. However, it and the R3 Amended Programmatic Agreement and its Appendix J does allow for the flexibility to develop a new strategy that would better address any unique challenges.

Introduction

The Four Forest Restoration Initiative (4FRI) is a landscape-level initiative designed to restore ecological resilience and natural fire behavior across 2.4 million acres on the Kaibab, Coconino, Tonto and Apache-Sitgreaves National Forests. This project is a collaborative effort comprised of a diverse group of stakeholders that includes members of local, county and state governments; organizations; institutions; environmental groups and industry representatives. The 2.4 million proposed acres were segmented into two study areas that are being analyzed under the National Environmental Policy Act (NEPA). The first analysis focused on the Kaibab and Coconino National Forests, while the second project area, the Rim Country EIS, is focused on the southern portion of the Coconino National Forest, the Apache-Sitgreaves and Tonto National Forest.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) and the implementing regulation 36 CFR 800, the potential effects of this undertaking on historic properties need to be taken into account. A cultural resource analysis of a project area also must be completed as part of the NEPA analysis. However, because 4FRI is a landscape scale project area, the implementation of the individual proposed actions will be accomplished through contracts and task orders. This document outlines a strategy for phased compliance with the NHPA and its implementing regulations by conducting heritage analysis prior to implementation of the individual contracts and task orders.

In 2010, the Southwest Region of the Forest Service completed the Appendix J, Standard Consultation Protocol for Large-Scale Fuels Reduction, Vegetation Treatment, and Habitat Improvement Projects of

the Region 3 Heritage First Amended Programmatic Agreement (USDA 2010). Appendix J was developed to replace the Region's Wildland Urban Interface Protocol and was expanded to incorporate large-scale vegetation treatment projects such as prescribed fire and mechanical treatments. See Appendix A of this document for a copy of Appendix J.

A Heritage Resources Strategy and NHPA Compliance document, which was based on Appendix J, was developed for the first EIS. The strategy included a model that would help to predict the density of sites and a sample survey strategy that could be used to comply with Section 106 of the NHPA without pre-consulting the AZSHPO. The approach in this document will be similar to the Heritage Resources Strategy developed for the first EIS. However, after a few years of implementing the first strategy, it was clear that there was a need for some modifications for the second strategy. Therefore, the intent of this document is to lay out a multiple-forest plan to identify a survey strategy and effects analysis similar to the first EIS and based on Appendix J with some variations and improvements.

Purpose, Need, and Proposed Action (Undertaking)

The purpose and need for the Rim Country Project was determined by comparing the existing conditions in the project area to the desired conditions in the land and resource management plans (Forest Plans related to Forest and ecosystem function and resiliency. In addition, relevant research, the best available science and information, and the landscape restoration criteria found in the Omnibus Public Land Management Act of 2009 (P.L. 111-11, Title IV Forest Landscape Restoration) were used to develop the purpose and need. These criteria for landscape-scale restoration address community, wildlife habitat, and forest protection while retaining as many large trees as possible. National direction found in Forest Service Manuals 2020 and 4000 was used to evaluate the needs for the Long Valley Experimental Forest.

The purpose of the Rim Country Project is to reestablish and restore forest structure and pattern, forest health, and vegetation composition and diversity in ponderosa pine ecosystems to conditions within the natural range of variation, thus moving the project area toward the desired conditions. The outcome of improving structure and function is increased ecosystem resiliency. Resiliency increases the ability of an ecosystem to survive natural disturbances such as fire, insects and disease, and climate change (FSM 2020.5) without changing its inherent function (SER 2004). This project is needed to:

- Increase forest resiliency and sustainability
- Reduce risk of undesirable fire effects
- Improve terrestrial and aquatic species habitat
- Improve the condition and function of streams and springs
- Restore woody riparian vegetation
- Preserve cultural resources
- Support sustainable forest products industries.

Proposed Action Activities:

To meet the purpose and need for the Rim Country Project and move the project area toward desired conditions, the Apache-Sitgreaves, Coconino, and Tonto National Forests propose mechanical thinning, prescribed fire, and other restoration activities throughout the project area that would make the forest more resilient to natural disturbances such as fire, insect and disease, and climate change. Restoration activities are needed to maintain or restore forest structure and pattern, desired fire regimes, and watershed and ecosystem health and function in ponderosa pine, ponderosa pine-Gambel oak, ponderosa pine-evergreen oak, frequent fire mixed conifer (dry mixed conifer), aspen, and grassland cover types, moving them toward conditions within the natural range of variation. Facilitative operations may be needed in other cover types (such as pinyon juniper) to enable or complete treatments in target cover types, by reducing uncharacteristic fire risk, reducing ground disturbance from fire line construction, or improving operability. Table 1 displays project area acreage by cover type. Table 2 displays acres to be thinned and burned by forest cover type.

Table 1. Acres of Cover Type

Cover Type	Total Acres
Juniper	28,340
Pinyon Juniper Woodland	83,330
Ponderosa Pine*	316,660
Ponderosa Pine-Gambel Oak*	170,710
Cottonwood Group	3,200
Aspen	1,450
Oak Shrubland	17,980
Ponderosa Pine-Evergreen Oak*	146,340
Mixed Conifer-Dry*	62,940
Mixed Conifer-Wet	2,650
Grassland	21,550
Reforestation Needs	69,360
Other	27,810

*Target cover type: frequent-fire type targeted for restoration treatments.

The proposed action is designed to achieve the purpose and need over a period of 10 years or until objectives are met. Restoration activities proposed for the Rim Country project area include:

- Mechanically thin trees and/or implement prescribed fire on approximately 952,330 acres.
    - Mechanically thin trees and implement prescribed fire on approximately 1,260 acres in the Long Valley Experimental Forest (in coordination with the Rocky Mountain Research Station).
    - Implement prescribed fire alone on approximately 45,290 acres.

    - Mechanically thin and/or implement prescribed fire on approximately 68,360 acres of Mexican spotted owl (MSO) protected activity centers (PACs), approximately 128,800 acres of MSO recovery habitat, and approximately 500,940 acres of northern goshawk habitat.
    - Mechanically thin trees and/or implement prescribed fire to restore approximately 40,760 acres of grasslands and meadows (includes 21,550 acres of grassland cover type).
    - Conduct facilitative operations (thin and/or burn) on up to 157,270 acres of non-target cover types to support treatments in target cover types.
    - Planting, burning, and other activities to encourage reforestation on approximately 69,360 acres of understocked areas that were previously forested.
- Decommission approximately 230 miles of existing system and unauthorized roads on the Coconino and Apache-Sitgreaves NFs.
- Decommission approximately 20 miles of unauthorized roads on the Tonto NF.
- Improve approximately 150 miles of existing non-system roads and construct approximately 350 miles of temporary roads for haul access; decommission when treatments are completed.
- Relocate and reconstruct existing open roads adversely affecting water quality and natural resources, or of concern to human safety.
- Restore hydrologic function and vegetation on approximately 9,570 acres of meadows.
- Restore approximately 184 springs.
- Restore function in up to 470 miles of riparian streams and intermittent and ephemeral stream channels (non-riparian[9]).
- Restore up to 360 miles of stream habitat[10] for threatened, endangered, and sensitive aquatic species.
- Construct up to 200 miles of protective barriers around springs, aspen, Bebb's willows, and big-tooth maples, as needed for restoration.

[9] Ephemeral and intermittent drainages that do not have perennial surface and ground water or riparian vegetation throughout the year.
[10] Non-riparian stream channels include ephemeral and intermittent streams that do not have either the duration of streamflow or sufficient water tables to create hydric (wet) soils that support hydrophilic (water-loving) plants.

Table 2. Acres of Proposed Mechanical Treatments and Prescribed Fire by Cover Type

Cover Type	Mechanical Treatment and/or Prescribed Fire	Prescribed Fire Only
Ponderosa Pine	316,500	160
Ponderosa Pine-Gambel	156,040	14,670
Ponderosa Pine-Evergreen	116,750	29,590
Dry Mixed Conifer	62,070	870
Aspen	1,450	0
Grassland	21,550	0
Totals	**674,360**	**45,290**

The Proposed Action Activities and Appendix J

For Section 106 purposes, the proposed action, or undertaking, can be broken down into three categories, thinning trees, decommissioning and improving roads, and improving watersheds and riparian areas. Appendix J: Standard Consultation Protocol for Large-Scale Fuel Reduction, Vegetation Treatment and Habitat Improvement Project, of the Amended R3 Programmatic Agreement, was designed to cover large-scale (larger than 1,000 acres) fuels reduction, vegetation treatment, and habitat improvement projects, and is the primary guidance that will be used for conducting Section 106 of the National Historic Preservation Act evaluations. Activities covered by the protocol include: hand thinning; mechanical thinning; use of equipment such as Hydro-ax, Agra-ax, brush crushers and brushhogs; timber sales; slash disposal, including lopping and scattering, chipping, pile burning, and windrow or jackpot burning; broadcast burning; and fuelwood use, including free use, fuelwood permits, and commercial fuelwood sales. See Appendix A

Appendix J will address most activities proposed by the Rim Country EIS such as the tree thinning, prescribed burning, watershed and riparian improvement activities, and road maintenance or construction of temporary roads built to aid in the tree thinning activities or moved as part of habitat improvements. The survey strategy presented in this document is designed to supplement Appendix J and aid in the development of a sampling strategy to address some of these types of activities without prior consultation with the Arizona State Historic Preservation Office (AZSHPO). However, the strategy and Appendix J does not cover activities such as the decommissioning of approximately 20 miles of unauthorized roads on the Tonto NF, or decommissioning of approximately 230 miles of existing system and unauthorized roads on the Coconino and Apache-Sitgreaves NFs, because they are not associated with tree thinning or habitat restoration. Therefore, these activities will not be included in the survey strategy developed in this document. However, they can be addressed using the processes and procedures of the 2004 Amended R3 Programmatic Agreement between the USDA Forest Service and the New Mexico, Arizona, Oklahoma and Texas State Historic Preservation Officers and the Advisory Council on Historic Preservation.

Project Area

The project area for the Rim Country EIS includes portions of Coconino, Yavapai, Gila, and Navajo Counties. Of the total project area, about 98,000 acres will be excluded from analysis because they are not National Forest System lands, or are included in other restoration NEPA projects that already have decisions.

- Approximately 37,000 acres have been excluded from being incorporated into treatment proposals because they are non-Forest Service lands. Past, present, and reasonably foreseeable actions on these lands will be addressed in cumulative effects.
- Approximately 61,000 acres have been excluded because they are already covered by NEPA decisions, with treatments designed to meet restoration objectives. These past and ongoing projects will be addressed in cumulative effects.
- Approximately 192,000 acres already covered by NEPA decisions will be included in the Rim Country analysis in order to incorporate additional restoration activities such as road decommissioning, spring and stream channel restoration, and wildlife habitat restoration.

Setting

Vegetation within the project area consists primarily of ponderosa pine with smaller concentrations of oak, pinyon-juniper and mixed conifer forests. The geology of the region is dominated by the Mogollon Rim which is an extended and uniform geologic monocline or fold that was formed about thirty million years ago.

Figure 1. 4FRI Rim Country Project Area

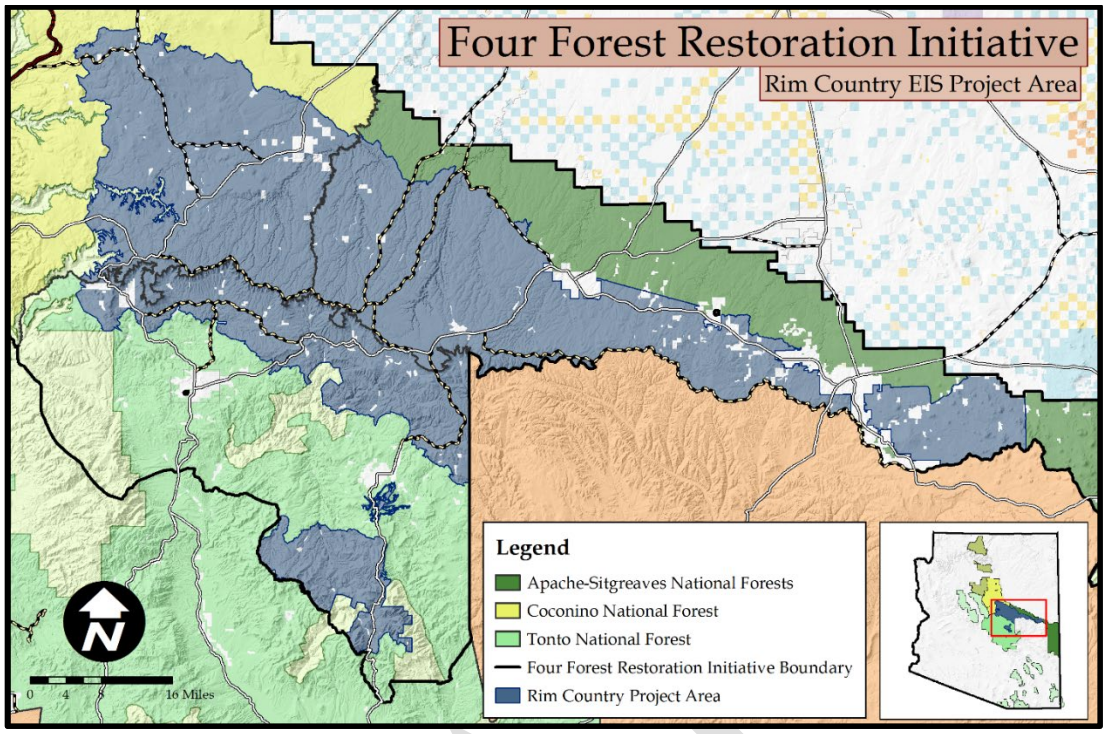
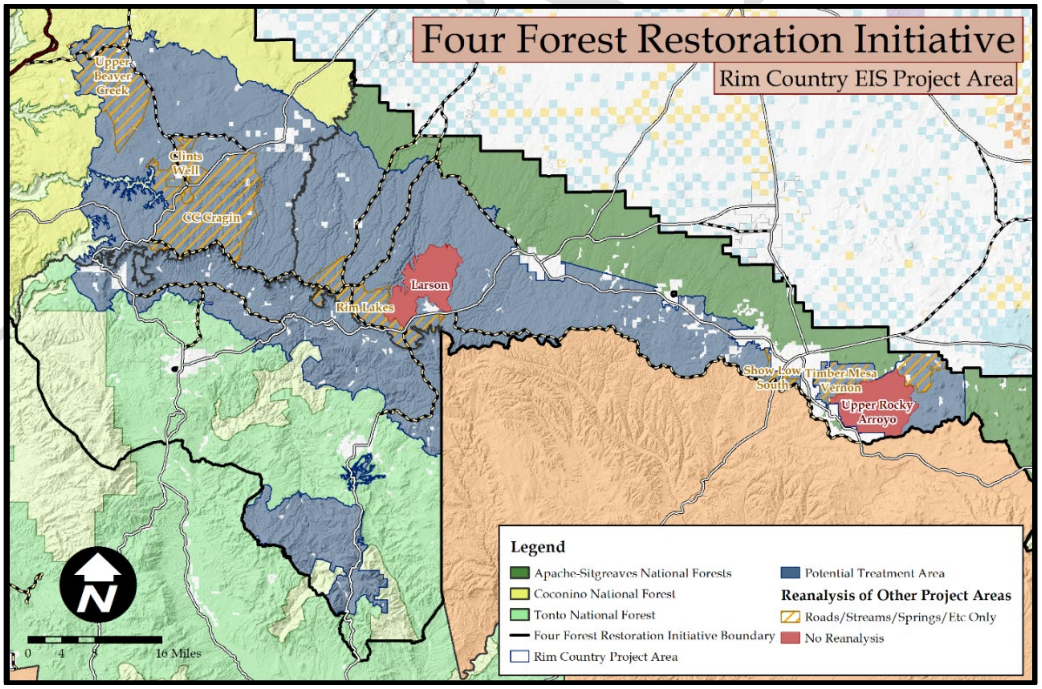


Figure 2. Other Projects within the 4 FRI Rim Country Project Area



Heritage Resources Overview

Cultural resources located within the Rim Country EIS Area of Potential Effect (APE) represent a long period of human occupation and use of the landscape beginning in the Paleoindian period and continuing into the present. Paleoindian sites (10, 000 to 6000 BC) are sparse and are represented by diagnostic projectile point types such as Folsom and Clovis. Several Clovis and Folsom points, and other Paleoindian artifacts have been found on or around the Apache-Sitgreaves National Forests (Taylor 2006), and one multi-component site with a Folsom component was recently recorded on the Apache National Forest. Only one Paleoindian site has been recorded on the portion of the Coconino National Forest within the project area. A number of Clovis style points have been found in the Verde Valley, located south west of the project area (Mabry, 1998). Paleo points and fragments have been found on the Tonto, both within and outside the project area.

The Archaic period sites (6,000 BC to AD 500) are numerous and are located in all vegetation zones, including the pine-type and mixed conifer. They are represented by habitation sites, rock shelters, rock-filled roasting pits, bedrock mortars, rock art, and dispersed artifact scatters and date from the Early to Late Archaic. Also, a variety of dart point types such as Bajada, Pinto/San Jose, Gypsum, Datil, and San Pedro are found at these sites and as isolated occurrences.

After the Archaic period, there is evidence of a cultural division within as native people started adapting to agriculture and a sedentary lifestyle. In the northern portion of the project area, about half of the recorded sites are positively identified as Sinagua occupations, or have shared site occupation with earlier or later peoples. Sinagua occupation ranged from 500AD to 1400AD. These Sinagua sites include pit houses, field houses, small pueblos and agricultural fields related to farming activities.

The southeastern side of the APE is affiliated with the precursors of the Mogollon, generally known more in the east central part of the state, and the southwestern side being affiliated with the precursors of the Ancestral Puebloan people as well as likely the Sinagua. These early agricultural site dates range from AD 400 to 800. Early Formative Period Mogollon and Pueblo I and Pueblo II period sites include pithouse villages, above ground habitation structures, field houses, midden deposits, agricultural sites, rock art and artifact scatters – to name a few. Formative site dates range from AD 800 to 1150.

Post archaic period on the Tonto is the Central Arizona Tradition indicative of interaction between the local indigenous descendants of the Archaic peoples and neighboring cultural groups, most closely associated with the Hohokam and Salado to the south. While Hohokam period sites are known, most are distinctive in terms of material culture to the Central Arizona Tradition, with locally produced plainwares, pithouses and later small surface masonry room blocks and compounds, fieldhouses, artifact scatters, agricultural sites, rock art and resource procurement areas for lithic production and trade. Site dates range from 400 AD to an apparently abandonment of the Sub-Rim region by approximately 1280 AD.

Habitation dramatically increases in the APE during the Middle and Late Mogollon and Pueblo II - early Pueblo III periods (1150 AD to 1250 AD). Some of these sites consist of multiple room blocks of between 30 and 40 rooms with associated features and artifacts. Several of these large sites include great kivas, the earliest dating to the Carrizo Phase (AD 1000-1150; Herr 2001: 47-48). The most numerous sites that date to this period are typically one-two room masonry structures, small room blocks of between 4 to 6 rooms, water control features, terraces, agave sites, rock art and dispersed to dense artifact scatters without any surface features.

In the eastern side of the APE, many of the larger prehistoric sites were occupied for a long duration, spanning between Pueblo II/Mid-Mogollon periods, to Pueblo II/Late Mogollon periods. During the latter years of the Late Mogollon and Pueblo III periods (ca. AD 1250-1300) there appears to have been a decline in site density throughout. By the Pueblo IV and Canyon Creek phases (circa AD 1300-1540), pueblos decrease in number over the landscape, but the number of rooms increase per site (Donaldson n.d.); pueblos with up to 250 rooms were also constructed during this time. Most sites appear to be

occupied at least into the mid-1300s or later (Lynette Cross, Casa Malpais Museum, personal communication June 21, 2015). Besides large pueblos, artifact scatters, rock art, and so forth, water and soil-control features become far more common than in previous times.

By mid-1400 ADs, most, of the APE was no longer used for permanent habitation by Puebloan people, but continued to be used on a temporary basis by the Zuni, Hopi and Acoma, descendants of the Mogollon and Ancestral Puebloan cultures.

Later occupation by the Apache and Yavapai from1300 AD to 1860 AD can be found at some of the sites near springs and water pools in the northern and western portion of the project area. The Yavapai occupied the Verde Valley to the west of the project area and utilized the uplands for hunting and plant collecting. Additionally, the Western Apache were known to have utilized the Mogollon Rim area. Late prehistoric and proto-historic use by the Hopi is also found in a few scattered sites containing Hopi style pottery.

Historic Period

Historic Euro-American exploration of the general vicinity of the APE begins in the 1860s, at the end of the Civil War. Gold Fever drove many easterners to the gold fields of California and Arizona and some passed through the APE in search of a place to mine or settle. Apache resistance to Euro-American settlement resulted in the establishment of Military forts in the vicinity of the APE, most notably Camp Mogollon (also called Camp Ord and Fort Apache) in 1870. Also, military trails such as General Crook, bisects the project area.

Ranching and homesteading commences in the late 1870s once Apache resistance had largely been stopped by military actions and the implementation of the reservation system. However, ethnographic evidence is now showing that in some areas Apache families managed to avoid military removal by staying in remote and rugged locations, most notably the Fossil Springs area. Ranching related sites include, log cabins, corrals, fences, tanks, spring boxes, troughs, stock driveways, camps, dip tanks, ditches, pipelines, wells, cisterns, homesteads and reservoirs. Several communities developed around ranching within and adjacent to the Rim Country EIS boundary include Clay Springs, Hay Lake, Linden, Long Valley, Morgan Flat, Pinedale, Snowflake, Tenny Flat, and Taylor. Most homesteads occurred between 1890s to the 1930s. Most include cabins and other living quarters, corrals, wells, ponds, fences, pastures, orchards, and cultivated fields.

The federal government set aside the first forest reserves starting in 1895. The Forest Service Organic Administration Act of 1897 (or better known as the Organic Act) was used by President McKinley to create the Black Mesa Forest Reserve in 1898, which included lands now within the boundaries of the Coconino, Tonto, Apache, and Sitgreaves National Forests. The Forest Reserves were originally administered by the General Land Office, which was under the Department of Interior. Under President Theodore Roosevelt, the Transfer Act of 1905 transferred the forest reserves from the Department of Interior, to the Department of Agriculture, Bureau of Forestry, and hence the Forest Service's life began under Forestry Chief Gifford Pinchot. In 1908, the Sitgreaves National Forest was created from a part of the Black Mesa Reserve, with Alexander J. Mackay appointed the first Supervisor. The Apache National Forest was also created from part of the Black Mesa Reserve, with Drayton C. Martin appointed the first Forest Supervisor. The two Forests, both of which are located within the overall 4FRI boundary, were administratively combined in 1974 (Morgan, 2016).

The Coconino National Forest was originally created from two earlier Forest Reserves. The San Francisco Mountains Forest Reserve included much of the Kaibab N.F., and the northern 2/3 of the Coconino National Forest. It includes the northern 1/3 of the project area on the Coconino NF. This Forest Reserve was created in 1898 and included only the even numbered sections. In 1902 the odd numbered sections were added to the Reserve. The south end of the Coconino NF was set aside as part of the Black Mesa Forest Reserve. Some additional areas were included in 1906. In 1908 the Coconino National Forest was created from parts of these two Forest Reserves, and part of the Black Mesa Forest Reserve was transferred to the Tonto National Forest which had been created in 1905. Segments of the Tonto National Forest were added to the Coconino National Forest in 1913 and 1915. Sites associated with forest administration includes ranger and guard stations, fire guard trails, phone lines between stations and lookouts, tool caches and early roads marked with blazed trees. There will also be recreational facilities like campgrounds, day use areas, trails and recreational travel routes.

Animal grazing in the project area started in the mid-1800s and included sheep, pigs, goats, horses and cattle. There are three major sheep driveways within the project area. The Beaver Creek-Grief Hill Sheep Driveway begins south of Flagstaff and basically parallels what is now Interstate-17 south to Phoenix. The Heber-Reno Sheep Driveway extends from the general vicinity of Heber on the Apache-Sitgreaves, down onto the Tonto National Forest through the Pleasant Valley District and on to the Salt River for winter forage. While signage may have once existed, the driveway is marked by numerous short-term historic camps, collapsed cairns along some of the margins, sheep dipping vats, wooden corrals and barbwire fences, and at least one known stone corral south of the project area. The Mud Tanks Stock Driveway runs across the project area from the Apache-Sitgreaves NF to the Verde Valley. These driveways were used by cattlemen and sheep herders to move stock from winter ranges to summer ranges. A number of signs mark the boundaries of these stock driveways which are shown on historic maps. Sites and features associated with the driveways will also include temporary historic camps, dendrogyphs, and water developments such as tanks, dams, and developed springs. Forest Service, after its inception, imposed regulations and policy on grazing and reduced the size of the herds to better protect the ranges.

At the beginning of permanent Hispanic and Anglo-American settlements in the 1860s and 1870s, logging activities in the forests of the Mogollon Plateau and Rim and in the White Mountains were geared mostly towards the building and grazing needs of individual homesteads (Matheny 1975, 1976:236-237; Lightfoot 1978). More substantial demand for building lumber, shingles, etc. in the vicinity of the Sitgreaves National Forest came in 1870, with the establishment of the army post and military reservation of Camp Mogollon (later Fort Apache), located to the south of the project APE. By the late 1880s, a steam-powered sawmill was operating near Fort Apache, probably to supply lumber to the army post (Department of the Interior 1894: 147).

Most early sawmills were portable, and such mills remained in place until all useable stands of timber within one or two miles around the mill site were logged out, then the mill was moved to a new cutting area (Plummer 1904: 14). For example, the Mormon-operated sawmill originally established at Mt. Trumbull on the Uinkaret Plateau was moved south to Sawmill Springs southeast of Flagstaff in late 1876. In 1882, the mill was moved to Pinedale, and then to Pinetop, before it was finally set up at

Lakeside, where it burned down in 1890 (McClintock 1985: 154-155; Matheny 1975: 43-44; cf. Baeza 2014: 63-65).

Through the 1870s, the small-scale logging operations on the Mogollon Plateau and along the Rim faced little external demands for lumber. The situation changed in 1879-80 with the construction of the transcontinental Atlantic and Pacific Railroad (A&P) between Gallup and Flagstaff, and when the A&P Railroad reached Holbrook and Flagstaff between 1880 and 1881 it resulted in an economic boom for the region (Lightfoot 1978). Construction of the railroad required between 3,000 and 3,400 ties per mile of track (Chappell 1971: 7). Not only did he A&P's arrival in Holbrook in 1880 mean an immediate demand for ties and railroad construction lumber, it also opened the doors for the transport of goods and livestock to other parts of the state and the country. As a result, sheep and cattle grazing became widespread throughout the Mogollon Plateau only after the A&P had reached Holbrook (Lightfoot 1978).

With improved access and transport routes, loggers by the turn of the century had spread out into previously untapped stands of timber in the Black Mesa Forest Reserve, and on the White Mountain Indian Reservation (today Fort Apache Indian Reservation), which was established in 1891.

Due to a rise in demand for lumber following the outbreak of World War I, railroad logging operations began in 1916-17 on the Sitgreaves National Forest and Fort Apache Indian Reservation. With an estimated half billion ft. of harvestable timber on the Fort Apache Indian Reservation alone, A. B. McGaffey, an Albuquerque lumber entrepreneur and Tom Pollock, a Flagstaff banker and owner of the Flagstaff Lumber Manufacturing Company, obtained support from the Atchison, Topeka and Santa Fe Railway Railroad (AT&SF, successor to the Atlantic and Pacific Railroad) to build a large sawmill at Cooley (previously called Cluff Cienega and now called McNary) and a railroad connecting the mill to the AT&SF's transcontinental mainline at Holbrook (McNary 1956:156; Matheny 1976:237-239). Construction of the Apache Lumber Company Mill at Cooley began in 1917. Railroad logging operations started first within a 30-mile radius surrounding McNary and Pinetop-Lakeside, and once the timber was exhausted, operations moved east into the Apache National Forest and south to Maverick, which is located on the Fort Apache Indian Reservation. Mainline construction between McNary, Snowflake and Holbrook was completed by February 1918 (Glover 1992). Logging camps and mills were established relatively close to its projected mainline grades (Lightfoot 1978).

Other large-scale logging operations on the Sitgreaves National Forest included the logging community of Standard, located near Pinedale, and Duke City, west of Chevelon Canyon. The Standard mill and company town was established in 1924. The mill included a boiler house, machine shop, waste burner, saw house, plane shop and log pond. The town had a hotel, schoolhouse, store, hospital, and housing for its employees. The Standard mill had a branch line of the Apache Railroad that went to the railroad depot at Snowflake. Logging spurs were constructed to log the surrounding countryside. The Great Depression killed mill operations in 1931 and the mill burned down in 1935. Logging resumed after 1935, but logs were skidded to the railroad tracks and the logs were processed at the McNary mill (Wood, 1980).

Duke City logging camp was established just prior to World War II as a logging camp and was associated with the Duke City Lumber Company in Albuquerque, New Mexico and the Duke City and Ramsey Lumber Companies in Winslow, Arizona. The name "Duke City" was first used for the community in 1948. The logging camp operated on National Forest System Land under special use permit until operations ceased in the late 1980s or 1990s. The Forest Service required the permittees to demolish all of the remaining buildings and infrastructure and

rehabilitate the camp in the early 1990s and by 1994 the community ceased to exist (Morgan 2015).

Logging began in the area of the Coconino and Kaibab National Forests as early as 1879 and has continued to the present. Logging occurred on the Tonto but at a much smaller scale and railroads systems were not installed for logging purposes on the Tonto.

Logging-related sites are represented by saw mills, logging camps, logging-related artifact scatters, historic-era stump fields, roads, logging skids, and logging railroad systems which include trestles, rail beds, bridges, sidings, corrals, maintenance areas, water-dispensary areas, wells, and other features.

The Civilian Conservation Corps (CCC) through the Emergency Conservation Work Act, was established in 1933 in an effort to provide work for thousands of unemployed young men within the nation's public lands. The Sitgreaves National Forest had two main camps and at least three spike camps located within the APE. The CCC projects included the construction of administrative sites and lookouts, picnic areas, campsites and shelters, construction of summer homes, installation of telephone lines, boundary fencing, trail, road and bridge building, installation of erosion-control devices like check dams, the construction of numerous other buildings, and various forestry endeavors across the forest (Moore 2006: 110, 126, 130-132). CCC infrastructure work continued until 1942, when the United States began focusing most of its attention on the war in Europe.

During World War II a large network of vehicular roads was constructed to access, harvest and transport timber for the War effort. By this time roads replaced most of the railroads to transport timber, except for the main lines used to transport lumber from the mill to train stations and thence across the nation. On the Sitgreaves National Forest, the main Apache Railway main line continued to be in use until 1982.

There has been limited historic mining activities within the APE. Manganese was mined in the Long Valley District on the Coconino NF and the Forest Lakes area on the Sitgreaves NF the high demand for manganese ore began during the Second World War as the government began to stockpile it. All of the mining at the Long Valley Mining District dates from the early 1900s to the 1950s. Manganese mining at Merzville (currently called Forest Lakes) began in 1939-40. In the early 1960s the U.S. Government ceased to purchase and stock pile manganese. The citizens of Merzville began logging and the patented mining claims were turned into a subdivision. By 1967, the name of the community was changed to Forest Lakes. Sites associated with these activities within the APE include prospect pits, trenches, ore processing areas and small mining camps. Numerous mining claim markers associated with this period of activity were recently recorded within the APE (Jones et. al. 2015). Mining on the Tonto has been sporadic, with a small amount of gold mining in the APE on the Payson District. Uranium mining did occur on both Tonto districts into the 1950s, but was most extensive on the Pleasant Valley District, which also saw widespread asbestos mining from the early 1900s through the 1950s and early 1960s.

The post-World War II boost in the US economy brought forth a renewed interest in recreating and sight-seeing on National Forest system lands. Highways within the APE were reconstructed and paved for passenger cars. The Forest Service and other agencies were also involved in reconstructing 1920s-1930s campgrounds and constructing new picnic areas, concessions, campgrounds, hiking and biking trails and fishing reservoirs within the APE. One of these developed areas is the "Mogollon Rim Recreation

Complex", which was a joint effort between the Arizona Department of Game and Fish and Coconino and the Sitgreaves National Forests. Plans for developing reservoirs and campgrounds along the Mogollon Rim were approved in 1964 and construction started soon after (CNF/ASNF 1964). Woods Canyon Lake, Knoll Lake, Bear Canyon Lake, Black Canyon Lake, Chevelon Canyon Lake and Rim Lake reservoirs were constructed just prior to or after the plans were approved (*Ibid.*). The Rim Road was re-designated as "Zane Grey Forest Drive" and connected Forest Highway 9 on the Coconino National Forest to State Highway 60 towards Globe. The reconstruction of the Rim Road between Forest Highway 11 (also historically known as State Highway 160 and now State Route 260) and the Mogollon Campground occurred in the early 1970s (Deborah MacIvor, Apache-Sitgreaves National Forests Engineer, personal communication January 14, 2016).

Camping, hunting and fishing were not the only types of recreation that occurred on the 4FRI forests. In the 1960s, the idea of a tourist passenger line on Apache Railway rails began to attract interest. In 1964, the White Mountain Scenic Railroad began operating on Apache Railway track during summer tourist seasons. This tourist railroad was not affiliated with either the Apache Railway or the lumber mills on the Fort Apache Indian Reservation. The Apache Railway subleased portions of the line between Snowflake, McNary, and Maverick to the White Mountain Scenic Railroad (Hill 1976). In July 1976, however, legal issues with the White Mountain Apache Tribe shut down the tourist railroad (Gilbert 1976).

Existing Conditions and Previous Survey

The existing condition for cultural resources is determined by the quantity of existing heritage inventories within the EIS boundaries. Also, the amount and/or types of resources, and cultural periods represented by those resources, that have been identified within the boundaries of the EIS. Table 3 was generated by the Apache-Sitgreaves and Coconino National Forest using their heritage GIS databases, while the Tonto used their hard copy heritage atlases.

Table 3. Cultural Resource Sites and Surveys within EIS Boundaries

Forest Name	Total Acres Previous Survey	Total Cultural Resources Recorded	National Register Listed Sites	National Register Eligible Sites	Unevaluated Sites	Site Previously Evaluated Ineligible
Apache-Sitgreaves	104,474	3,012	6	795	2,026	57
Coconino	97,900	946	2	148	774	22
Tonto	29,226	1100	2	388	621	91

Apache-Sitgreaves National Forests

The Rim Country EIS APE includes 539,942 acres of the Apache-Sitgreaves National Forests (ASNF), [401,911 acres on the Black Mesa Ranger District (65% of the entire RD) and 138,031 acres on the Lakeside Ranger District (51% of the entire RD)]. According to current ASNF GIS

data, within in the EIS boundaries, ASNF archaeologists have surveyed 90,929 acres of the 539,942-acre project area (16.8% of the EIS boundaries).

Three thousand and twelve (3,012) cultural resources have been recorded (1,694 on the Black Mesa RD and 1,318 on the Lakeside RD), of which six are listed on the National Register of Historic Places (National Register), 795 were determined eligible for inclusion on the National Register, 2,026 are unevaluated for eligibility and 27 have been determined not eligible for inclusion on the National Register. Most of the sites recorded are prehistoric or protohistoric in nature (n=2,532, 84.1%) followed by historic sites (n=360, 11.9%), 74 sites of unknown affiliation (2.5%) and multi-component sites with historic and prehistoric artifacts/features (n=46, 1.5%). Site types represent a full range of human occupation, from Paleoindian sites of the Pleistocene to a wide variety of historic period sites dating to 50 or more years ago.

Coconino National Forest

The Rim Country EIS APE includes 398,860 acres of the Coconino National Forest, (389,482 acres on the Mogollon Rim RD and 9,378 acres on the Red Rock Ranger District). Within in this area, Coconino National Forest archaeologists have surveyed 97,900 acres of the 398,860-acre project area (24.5% within the EIS boundary). Archaeologists have identified 946 cultural resources, of which 2 are listed on the National Register of Historic Places, 148 were determined eligible to the National Register, 774 are unevaluated for eligibility and 22 have been determined not eligible for inclusion on the National Register.

Most of the sites recorded are prehistoric in nature (n=738, 78%) followed by historic sites (n=189, 20%), multi-component sites with historic and prehistoric artifacts/features (n=15, 16%) and 4 sites of unknown affiliation. The majority of the prehistoric sites are lithic scatters (47%) and scatters with lithic artifacts and ceramics, (21%). Other prehistoric sites include sites with house features (field houses, pueblos, pithouses, cliff dwellings or other house features (20%), caves/rockshelters/cavates (3%), agricultural fields (3%), and rock art sites (4%). The 189 historic sites, include those associated with National Forest management (21%), logging or sawmills (7%), ranching (47%), historic trails or wagon roads (6%), mining (3%), military (3%), historic burials (3%) and 10% are trash dumps that may be related to one or several of these historic activities.

Tonto National Forest

The Rim Country EIS APE includes 290,090 acres on the Payson and Pleasant Valley Districts of the Tonto National Forest. Within in this area, Tonto National Forest Archaeologists have surveyed 29,226 acres of the 290,090-acre project area (10 % within the EIS boundary). Archaeologists have identified 1100 cultural resources, of which two are listed on the National Register of Historic Places, 388 were determined eligible for inclusion on the National Register, 621 are unevaluated for eligibility and 91 have been determined not eligible for inclusion on the National Register.

Multiple Forest Survey Strategy

Developing this multiple-forest survey strategy for the Rim Country EIS is based on the original strategy and lessons learned from implementing the heritage analysis under the first EIS on the Kaibab and the Coconino National Forests. It also recognizes that this project area may offer challenges that maybe different from those of the first 4FRI EIS analysis area.

Like the first EIS strategy, this strategy is tiered off of Appendix J of the First Amended Programmatic Agreement. All stipulations of Appendix J apply here, except as described below. For example, Section I of Appendix J enumerates a survey strategy under the protocol which does recognize that 100% survey is not required for all situations and allows the Forest Archaeologist to determine the amount of inventory necessary based on the guidelines incorporated in the appendix. It also encourages Forest Archaeologists to discuss sampling survey designs with the SHPO.

Section 5 of Appendix J states that " a Forest or Forests may opt to develop a Forest-wide survey strategy for WUI and other large-scale fuels reduction, vegetation treatment, or habitat improvement projects in consultation with the SHPO and thereby further eliminate the need for individual project notifications for sample surveys." The proposed actions within the RIM Country EIS does include a variety of proposed restoration projects focused on thinning ponderosa pine stands, road improvement or decommissioning and watershed and riparian improvements (See page 7). All of these activities have the potential to adversely affect cultural resources. However, some activities, such as mechanical thinning using skidders and feller bunchers, can be very destructive to cultural sites because of the amount of ground disturbance associated with this activity. Whereas other activities such a hand thinning and prescribed burning, for example, generally do not involve a large amount of ground disturbance and are less likely to have an adverse effect on most cultural resources.

Section 1 of Appendix J contains heritage resource inventory strategies that include a sample strategy that can be employed without prior SHPO consultation for "activities conducted within areas that were previously disturbed by chaining, discing, plowing, windrowing, crushing, or other extensive ground disturbing treatments," for hand thinning, and prescribed burning projects. These types of activities were often done for purposes of increasing range viability, occurring prior to the enactment of the NHPA, and were not documented. They had a major impact to cultural resources. Therefore, the Forest Archaeologist may deem that sampling may be appropriate in those areas

Additionally, large area of the EIS project area have been logged during the last 100 years. However general impacts from historic logging activities was not documented systematically and because of the variability of the types of equipment, scope and activities, the level of impact on cultural resources from historic logging alone cannot be considered previously disturbed to the point that a sample survey is appropriate. Furthermore, some remnants of the historic logging activities may be eligible for the National Register of Historic Places, such as logging railroad system.

According to Appendix J "all high impact treatments resulting in intensive ground disturbance that would likely adversely affect any historic properties that may be located in the area of potential effect will receive 100% survey." What that section of Appendix J does not do is distinguish between the amount of disturbance and the level of risk to cultural resources based on the average site density within a treatment area. Consequently, the cultural resource survey strategies implemented under the Rim Country EIS should consider the level of threat to cultural resources from the proposed activity and the potential amount of resources that are likely to be within the treatment area. The following survey strategy that has been developed in consultation with the AZSHPO and tribes. Thus, it needs no further consultation prior

to implementation. However, if this sample survey strategy does not meet the needs of a particular task order or treatment plan, and the forest is planning to conduct a sample survey strategy that is outside of the scope of the one developed in this document or Section I of Appendix J, then it will require pre-implementation consultation with the AZSHPO and tribes.

Archaeological Site Density

One of the key component of developing a sampling strategy is to take into account the number of sites that may be found within a treatment area. A model was created for both prehistoric and historic archaeological site density surfaces by calculating the site density per square mile within aggregated Terrestrial Ecological Unit (TEU) strata. A full report on the model is located in Appendix B. The model determined the following site densities. Tables 4 and 5 show the density per TEU strata that is shown in Figures 3 and 4.

Table 4. Prehistoric/Multiple

Strata	Sites Per Sq. Mile
01-Wetland Riparian Areas (Lentic)	4
02-Montane Meadows	4
03-Streamside Riparian Areas (Lotic)	12
05-Pinyon-Juniper Woodlands	38
06-Pinyon-Juniper Woodlands	22
07-Pinyon-Juniper Woodlands	34
08-Grasslands with some PJ mixed	7
10-Great Basin Grasslands	3
11-Ponderosa Pine-Pinyon/Juniper Transition Woodland	15
12-Ponderosa Pine-Alligator Juniper-Pinyon/Juniper	9
13-Ponderosa Pine-Pinyon/Alligator Juniper and Evergreen Oak Forest	10
15-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	6
16-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	4
17-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	2
18-Ponderosa Pine-Gambel Oak Forest	5
19-Ponderosa Pine-Gambel Oak Forest	6
20-Ponderosa Pine-Gambel Oak Forest	4
21-Ponderosa Pine-Gambel Oak Forest	2
22-Ponderosa Pine-Alligator Juniper-Gambel Oak Forest	7

23-Ponderosa Pine-Alligator Juniper-Gambel Oak and Ponderosa Pine-Gambel Oak	8
24-Dry Mixed Conifer-Ponderosa Pine Transitional Forest	5
25-Dry Mixed Conifer Forest	1
26-Wet Mixed Conifer Forest	0
27-Dry Mixed Conifer Forest	0
28-Wet Mixed Conifer Forest	0
29-Ponderosa Pine and Wet Mixed Conifer Forest	3

Table 5. Historic/Multiple

Strata	Sites Per Sq. Mile
01-Wetland Riparian Areas (Lentic)	12
02-Montane Meadows	10
03-Streamside Riparian Areas (Lotic)	6
05-Pinyon-Juniper Woodlands	6
06-Pinyon-Juniper Woodlands	3
07-Pinyon-Juniper Woodlands	3
08-Grasslands with some PJ mixed	3
10-Great Basin Grasslands	3
11-Ponderosa Pine-Pinyon/Juniper Transition Woodland	2
12-Ponderosa Pine-Alligator Juniper-Pinyon/Juniper	3
13-Ponderosa Pine-Pinyon/Alligator Juniper and Evergreen Oak Forest	3
15-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	1
16-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	2
17-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	2
18-Ponderosa Pine-Gambel Oak Forest	2
19-Ponderosa Pine-Gambel Oak Forest	1
20-Ponderosa Pine-Gambel Oak Forest	5
21-Ponderosa Pine-Gambel Oak Forest	2
22-Ponderosa Pine-Alligator Juniper-Gambel Oak Forest	1
23-Ponderosa Pine-Alligator Juniper-Gambel Oak and Ponderosa Pine-Gambel O*	1
24-Dry Mixed Conifer-Ponderosa Pine Transitional Forest	1

25-Dry Mixed Conifer Forest	3
26-Wet Mixed Conifer Forest	1
27-Dry Mixed Conifer Forest	1
28-Wet Mixed Conifer Forest	1
29-Ponderosa Pine and Wet Mixed Conifer Forest	2

Figure 3. Prehistoric Site Density Surface

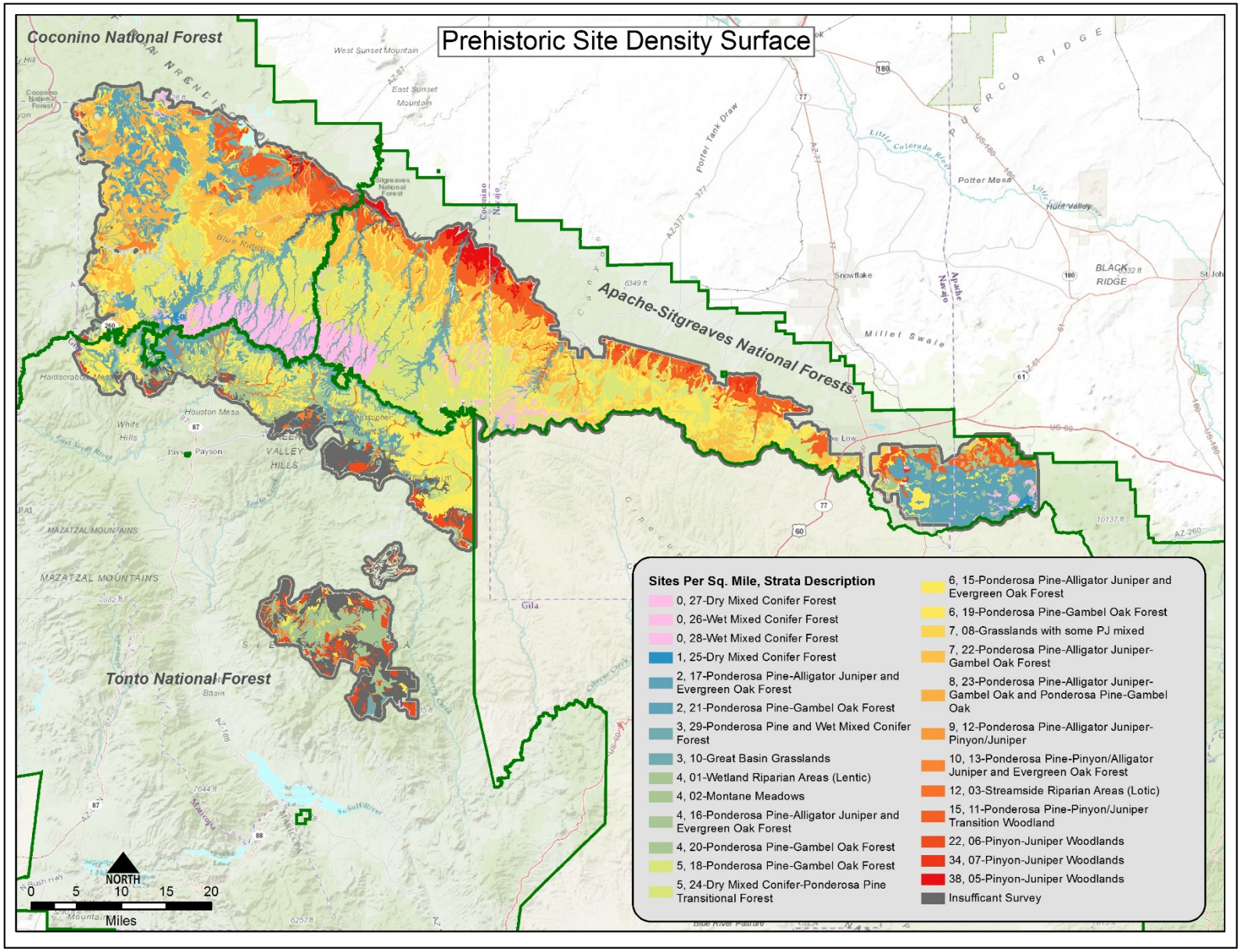
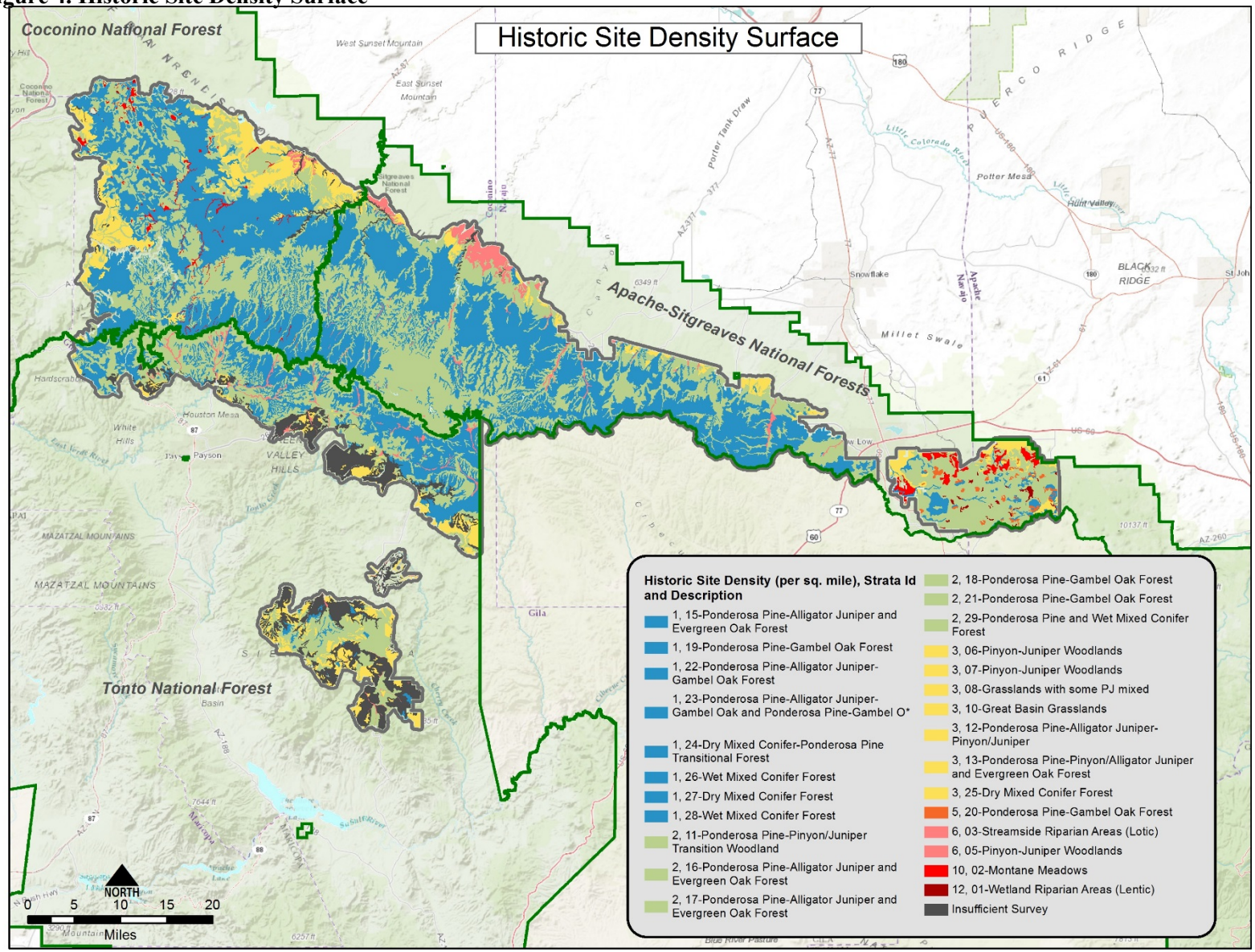


Figure 4. Historic Site Density Surface



Sample Survey Strategy for Mechanical Treatment

The strategy outlined here is basically the same developed for the first EIS. The premise for the sample strategy is based on the amount of risk an activity will have to adversely affect cultural resources and the overall average archaeological resources site density within a proposed treatment area.

Table 6 outlines the sampling strategy for mechanical treatments. When high intensity activities such as mechanical treatment of a Ponderosa Pine stand is proposed within an area that has an average to above average site density, then 100% survey is required. If a low intensity activity is proposed regardless of site density, or if a high or low intensity activity is proposed within a lower than average site density area, then one of the sample strategies listed in Table 6 can be employed.

High impact activity includes harvesting trees using heavy machinery such a feller bunchers skidders, dozers and graders, construction of roads, temporary roads, decks and landings. Low impact activities include cutting trees with an agra-axe on a rubber tire bob cat under certain conditions, using a chipper, and pre-commercial thinning of small diameter trees which is limited to hand tools. Hand thinning as per the Appendix J will not require field inventory, unless determined by the Forest Archaeologist.

Table 6. Inventory Methods for Mechanical Treatment

	High Site Density/High Impact Activity	**High Site Density, Low Impact Activity**	**Low Site Density/High Impact Activity**	**Low Site Density/Low Impact Activity**
Survey Levels	100% inventory of the overall treatment area in the task order/ contract	25% to 50% inventory of the overall treatment area in the task order/contract.	25% to 50% inventory of the overall treatment area in the task order/ contract Intensive, 100% inventory of all identified high impact activity locations.*	0 to 25% inventory of the overall treatment area in the task order/ contract.

*See above for list of high impact activities.

Before a survey strategy is devised for a treatment area, an average site density should be determined based on the model included in this document. The other important factor in selecting a sample survey strategy is the results of the class I inventory of a treatment area and the Forest Archaeologist's knowledge of the area. The site density model was developed using

Terrestrial Ecological Units (TEU) and the existing survey data from the forests. There are factors such as the presence or absence of water sources or other resources which were not factored into the model and can affect site density. Also, historic sites such as logging railroads are dependent on topography, not on soil type or environmental zones. Thus, background research and local knowledge should be a strong factor when determining the overall site density of a treatment area and which sample strategy to employ.

Sample Survey Implementation

The survey percentages proposed in Table 6 that are less than 100% are subject to local conditions and individual judgment. Inspection of site densities in Table 4 and Table 5 show that, overall, the mean density of prehistoric sites is 8 per square mile and 2 historic sites per square mile, thus giving a starting point for what "low density" would be in the project area. These figures would be adjusted according to known conditions of specific treatment areas based on Class I information. Likewise, the majority of the proposed treatment areas will have some existing inventory, therefore the percentage of additional inventory that will be recommended for a treatment area will take into account the type of proposed treatment and the results of a Class I inventory (previous records search) which will show the amount of existing inventory within a treatment area. Along with the average site density of an area which will be derived from a combination of the results of the Class I, the site density model, and local knowledge of the treatment area. All proposed treatment areas should get no less than 25% inventory.

In some cases, particularly in areas where there is little previous inventory, site densities may prove to be much higher than expected. Therefore, expanding survey areas or strategically focusing on area where the current inventory suggests sites might occur, say near water sources, may be prudent to ensure that the National Register eligible sites have been identified and potential effects mitigated.

Figures 3 and 4 show areas listed as "Insufficient Survey." These areas did not have enough soil data to prescribe them to a specific TEU. If there are treatments recommended within those areas, then the Forest Archaeologist will follow the same method to determine a survey percentage as listed above except they will rely only on the proposed treatment type, the results of the Class I, and local knowledge of the treatment area.

Appendix J, Stipulation 14, states that a phased approach should be used only when a large-scale project is to be implemented spanning more than one fiscal year. The Four Forest Restoration Initiative meets that criterion as it will be implemented over a ten-year time frame. General locations and treatments are identified through the initial EIS process. However, site specific locations for implementation (Task Orders) may be years in the future.

Heritage inventory reports for project specific undertakings and Task Orders will be provided to SHPO, and tribes, if requested, upon completion of the fieldwork for that particular task order and will include survey results, site eligibilities, and determinations of effect as well as any recommended management concerns or issues.

In addition, each heritage inventory report produced using the model developed for this strategy shall include a discussion of how inventory results support or contrast with the existing GIS model of heritage

site density. This will help to determine the effectiveness of the existing model and allow for future refinement.

As stated above, if the Forest Archaeologist or SHPO feels the need to conduct additional survey for a specific Task Order then it can be recommended. If the Forest Archaeologist wants to use a survey approach not described in this document, they shall develop a new sample survey strategy to address the additional inventory in consultation with the SHPO and tribes, if appropriate.

Monitoring

Appendix J states that monitoring "shall include appropriate post-project monitoring requirements as determined necessary by the Forest Archaeologist, to assess the effectiveness of protection measures." Under this strategy the forest will monitor a selection of sites in order to assess their relative condition and the effectiveness of the mitigation measures employed. This internal monitoring information should be used to inform future landscape restoration and prescribed fire treatments.

If monitoring reveals issues or concerns, Forest Archaeologists should develop new mitigation strategies to address those concerns. Any revised approaches should be developed in discussion with forest leadership as well consultation with as Tribes and SHPO. Copies of the post project implementation monitoring reports will be sent to SHPO annually.

Tribal Consultation

Tribal Consultation will be conducted in accordance with the R3 Amended PA. Based on historic, ethnographic, and tribal information, several Native American Tribes and groups have historically occupied, used and/or have ties to the lands currently managed by the Apache-Sitegreaves, Coconino, and Tonto National Forests. These groups include the Fort McDowell Yavapai Nation, Hopi Tribe, Havasupai Tribe, Hualapai Tribe, Kaibab Paiute, Mescalero Apache, Navajo Nation, Pueblo of Acoma, Pueblo of Zuni San Carlos Apache Tribe, San Juan Southern Paiute, Tonto Apache Tribe, Yavapai-Apache Tribe, Yavapai-Prescott Tribe, and White Mountain Apache Tribe. Consultation with Native American Tribes has been initiated and will be on going throughout the planning and Section 106 evaluation process, which includes individual task orders. The Tonto National Forest's Tribal Liaison is the lead for these consultations.

Conclusions and Recommendations

The Rim Country EIS Heritage Strategy consists of three components, 1. Appendix J allows a consistent approach across all forests involved in the project and ensures the complete survey of intensive ground disturbance as well as high site density areas, 2. The survey strategy developed

in this document is based on the level of potential effects on heritage resources from mechanical treatments and the density of sites within a treatment or Task Order area, 3. The GIS model developed for the EIS project area will assists in determining the average site density within the EIS project area.

Should the SHPO and Native American tribes concur with this proposal, the Apache-Sitgreaves, Coconino, and Tonto National Forests will implement the Rim Country EIS using Appendix J and the survey strategy in this document. All sites listed, considered eligible or currently unevaluated for the National Register of Historic Places shall receive protection from project activities in accordance with Appendix J. As long as the phased projects conforms to Appendix J and the agreed upon survey strategy, the effects of mechanical treatment activities implemented will meet the criteria of no adverse effect pursuant the Amended R3 Programmatic Agreement.

This report is submitted in compliance with the provisions of the National Historic Preservation Act of 1966, as amended.

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Appendix A

Rim Country Heritage Site Density Model
January 9, 2017
Submitted by: Christopher Boyce Barrett

This model creates prehistoric and historic archaeological site density surfaces by calculating the site density per square mile within aggregated Terrestrial Ecological Unit strata. To create the site density for Rim Country project area, I worked with an aggregated TEU and site and survey data from the Apache-Sitgreaves National Forests, Coconino National Forest, and the Tonto National Forest. I calculated density by using the number of sites recorded within each stratum divided by the total acres examined. This calculation results in the number of sites per acre. That figure is then multiplied by 640 (the number of acres within a square mile) to provide the estimated number of sites per square mile within the stratum, the site density for each strata.

TEU Aggregate Scale

Mark Nigrelli (Four Forest Restoration Initiative- GIS Specialist) provided me with the Combined_StrataSummary_RimCounty feature class. I combined the Strata Number, Description, and Slope (when there were data) as follows:

- 01-Wetland Riparian Areas (Lentic), Deep, Fine or Very Fine-Textured Hydric Soils
- 02-Montane Meadows, Deep Fine-Textured Soils
- 03-Streamside Riparian Areas (Lotic), Channel, Terrace, and Floodplain Soils
- 04-Pinyon-Juniper Woodlands Mountains and Escarpments, Shallow, Rocky Soils, Slope >40%
- 05-Pinyon-Juniper Woodlands, Calcareous Soils, Slope <40%
- 06-Pinyon-Juniper Woodlands, Fine-Textured Soils, Slope <40%
- 07-Pinyon-Juniper Woodlands, Fine-Textured Soils, Slope <15%
- 08-Grasslands with some PJ mixed, Very Fine-Textured (Vertic) Soils,
- 09-High Productivity Pinyon-Juniper Transition Woodland, Fine-Textured Soils, Slope 15-60%
- 10-Great Basin Grasslands, Very Fine-Textured (Vertic) Soils, Slope <15%
- 11-Ponderosa Pine-Pinyon/Juniper Transition Woodland, Soils Derived from Basalt and Cinders, Slope <40%
- 12-Ponderosa Pine-Alligator Juniper-Pinyon/Juniper, Slope 15-40%
- 13-Ponderosa Pine-Pinyon/Alligator Juniper and Evergreen Oak Forest, Soils Derived from Basalt and Cinders, Slope <15%
- 14-Ponderosa Pine-Pinyon/Alligator Juniper and Evergreen Oak Forest, Soils Derived from Basalt and Cinders, Slope 16-40%
- 15-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest, Soils Derived from Sandstone or Sedimentary Rocks, Slope <15%
- 16-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest, Fine-Textured Soils Derived from Basalt and Cinders, Slope 15-40%
- 17-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest, , Slope 40-80%
- 18-Ponderosa Pine-Gambel Oak Forest, Soils Derived from Limestone, Sandstone and/or Chert, Slope <15%

- 19-Ponderosa Pine-Gambel Oak Forest, Soils Derived from Limestone, Sandstone and/or Chert, Slope 15-40%
- 20-Ponderosa Pine-Gambel Oak Forest, Erosive, Cinder Cone Soils, Slope 16-40%
- 21-Ponderosa Pine-Gambel Oak Forest, Mollisol Soils Derived from Basalt and Cinders, Slope <15%
- 22-Ponderosa Pine-Alligator Juniper-Gambel Oak Forest, Soils Derived from Sedimentary or Volcanic (Basalt) Parent Materials, Slope <15%
- 23-Ponderosa Pine-Alligator Juniper-Gambel Oak and Ponderosa Pine-Gambel O*, Shallow, Rocky Soils Derived from Basalt and Cinders, Slope <15%
- 24-Dry Mixed Conifer-Ponderosa Pine Transitional Forest, , Slope 0-40%
- 25-Dry Mixed Conifer Forest, Soils Derived from Volcanic Parent Material (Andesite, Basalt, and/or Cinders), Slope <15%
- 26-Wet Mixed Conifer Forest, Erosive, Cinder Cone Soils, Slope 16-40%
- 27-Dry Mixed Conifer Forest, Soils Derived from Pre-dominantly Sedimentary Parent Material, Slope <15%
- 28-Wet Mixed Conifer Forest, Soils Derived from Sedimentary or Volcanic (Basalt) Parent Materials, Slope 16-40%
- 29-Ponderosa Pine and Wet Mixed Conifer Forest, Soils Derived from Sedimentary or Volcanic (Basalt) Parent Materials, Slope >40%

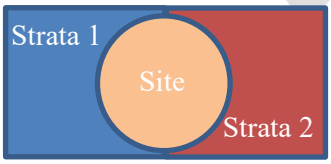
These strata combined with where archaeological survey occurred is instrumental in determining site density.

Site Data

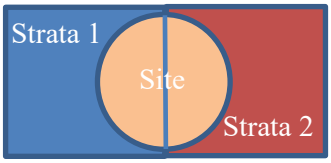
I created the site layer by combining data from the Apache-Sitgreaves National Forests, Coconino National Forest, and the Tonto National Forest. I received point, line, and polygon site features. This density model requires that the sites are all point features that can be associated with which TEU the site falls inside. To do this, I identified which sites I already had as points (there were cases where I had sites in multiple feature classes) and then worked with the linear and polygon sites. Some polygon and linear sites spanned multiple strata. To account for this, I ran an identity between the linear sites and TEU and the polygons and TEU. This geoprocessing step created a site line and polygon for each instance where a site is inside a TEU.

For example:

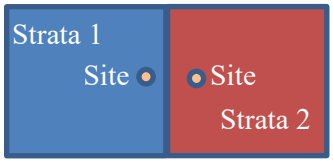
Before the identity a site can be in two strata:



After the identity is run the site can be identified as being in both strata:



Now that the site polygon has been split, I created a point for each part of the site in each strata.



This technique allowed large polygon sites and long linear sites to be properly associated with all the TEU they are within. I reviewed the data and removed duplicate points.
With the sites all converted to points, I ran a spatial join to identify which sites are within which TEU. I retained site type information, Historic, Prehistoric, and Multiple for each site. I excluded sites that did not have a site type identified.

Survey Data

For the survey data, I created a single survey polygon layer. To do this, I buffered liner and point surveys by 60-feet. I then merged and dissolved all the surveys to create a single survey polygon layer.

TEU Strata and Survey Coverage

I decided that in order to be included in the model, a strata had to have at least 10-perent survey coverage. I determined this by running an identity between the Aggregated TEU and the single survey polygon layer.

Aggregated TEU Strata	Survey Acres	% Survey
01-Wetland Riparian Areas (Lentic)	**1,709**	**100%**
Survey	1,092	64%
Not Surveyed	618	36%
02-Montane Meadows	**12,944**	**100%**
Survey	5,799	45%
Not Surveyed	7,145	55%
03-Streamside Riparian Areas (Lotic)	**11,666**	**100%**
Survey	5,150	44%
Not Surveyed	6,516	56%
04-Pinyon-Juniper Woodlands Mountains and Escarpments	**31,098**	**100%**
Survey	1,585	5%
Not Surveyed	29,513	95%
05-Pinyon-Juniper Woodlands	**12,643**	**100%**
Survey	3,568	28%
Not Surveyed	9,075	72%

06-Pinyon-Juniper Woodlands	**36,660**	**100%**
Survey	8,405	23%
Not Surveyed	28,255	77%
07-Pinyon-Juniper Woodlands	**3,113**	**100%**
Survey	631	20%
Not Surveyed	2,482	80%
08-Grasslands with some PJ mixed	**18,371**	**100%**
Survey	2,964	16%
Not Surveyed	15,407	84%
09-High Productivity Pinyon-Juniper Transition Woodland	**21,425**	**100%**
Survey	1,263	6%
Not Surveyed	20,162	94%
10-Great Basin Grasslands	**12,132**	**100%**
Survey	1,915	16%
Not Surveyed	10,218	84%
11-Ponderosa Pine-Pinyon/Juniper Transition Woodland	**72,184**	**100%**
Survey	28,553	40%
Not Surveyed	43,631	60%
12-Ponderosa Pine-Alligator Juniper-Pinyon/Juniper	**11,918**	**100%**
Survey	3,283	28%
Not Surveyed	8,635	72%
13-Ponderosa Pine-Pinyon/Alligator Juniper and Evergreen Oak Forest	**9,407**	**100%**
Survey	1,465	16%
Not Surveyed	7,943	84%
14-Ponderosa Pine-Pinyon/Alligator Juniper and Evergreen Oak Forest	**15,518**	**100%**
Survey	1,165	8%
Not Surveyed	14,352	92%
15-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	**39,462**	**100%**
Survey	15,429	39%
Not Surveyed	24,033	61%
16-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	**70,231**	**100%**
Survey	14,682	21%
Not Surveyed	55,549	79%
17-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	**15,100**	**100%**

Survey	1,947	13%
Not Surveyed	13,153	87%
18-Ponderosa Pine-Gambel Oak Forest	**180,525**	**100%**
Survey	98,808	55%
Not Surveyed	81,717	45%
19-Ponderosa Pine-Gambel Oak Forest	**206,360**	**100%**
Survey	84,664	41%
Not Surveyed	121,697	59%
20-Ponderosa Pine-Gambel Oak Forest	**3,675**	**100%**
Survey	2,989	81%
Not Surveyed	686	19%
21-Ponderosa Pine-Gambel Oak Forest	**90,360**	**100%**
Survey	51,875	57%
Not Surveyed	38,485	43%
22-Ponderosa Pine-Alligator Juniper-Gambel Oak Forest	**155,412**	**100%**
Survey	61,141	39%
Not Surveyed	94,271	61%
23-Ponderosa Pine-Alligator Juniper-Gambel Oak and Ponderosa Pine-Gambel Oak	**29,468**	**100%**
Survey	6,761	23%
Not Surveyed	22,708	77%
24-Dry Mixed Conifer-Ponderosa Pine Transitional Forest	**16,402**	**100%**
Survey	7,005	43%
Not Surveyed	9,397	57%
25-Dry Mixed Conifer Forest	**2,457**	**100%**
Survey	1,469	60%
Not Surveyed	988	40%
26-Wet Mixed Conifer Forest	**3,031**	**100%**
Survey	2,513	83%
Not Surveyed	517	17%
27-Dry Mixed Conifer Forest	**27,473**	**100%**
Survey	13,997	51%
Not Surveyed	13,476	49%
28-Wet Mixed Conifer Forest	**36,684**	**100%**
Survey	17,001	46%

Not Surveyed	19,682	54%
29-Ponderosa Pine and Wet Mixed Conifer Forest	**87,807**	**100%**
Survey	14,887	17%
Not Surveyed	72,920	83%

Strata 4, 9, and 14 are excluded from further analysis as they are all under the 10-percent survey threshold.

Determining Site Density within TEU Strata

With the TEU Strata that has adequate survey identified, I calculated site density for Prehistoric/Multiple and Historic/Multiple site types by using the number of sites recorded within each stratum divided by the total acres examined. This calculation results in the number of sites per acre. That figure is then multiplied by 640 (the number of acres within a square mile) to provide the estimated number of sites per square mile within the stratum, the site density for each strata

Prehistoric/Multiple

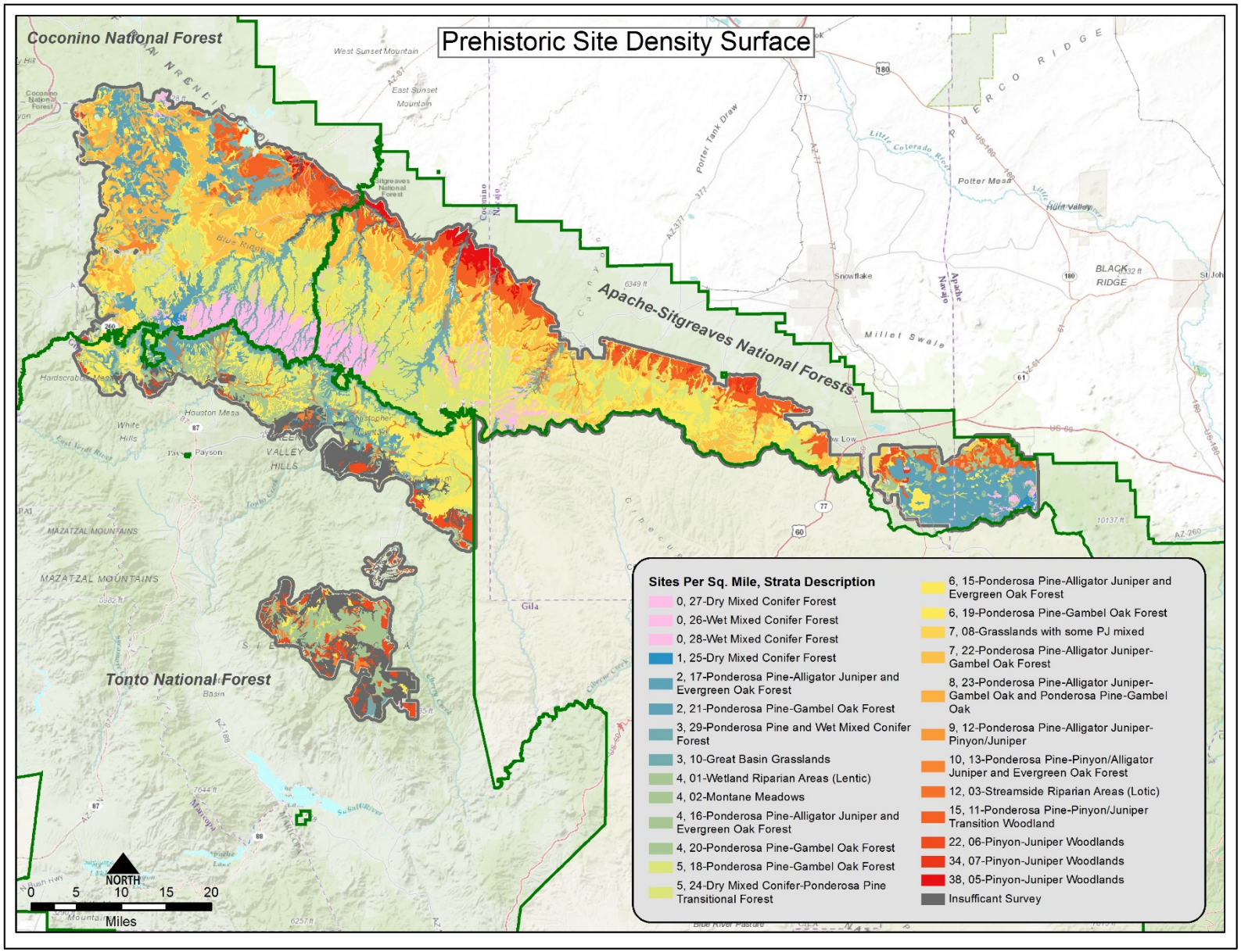
Strata	Sites Per Sq. Mile
01-Wetland Riparian Areas (Lentic)	4
02-Montane Meadows	4
03-Streamside Riparian Areas (Lotic)	12
05-Pinyon-Juniper Woodlands	38
06-Pinyon-Juniper Woodlands	22
07-Pinyon-Juniper Woodlands	34
08-Grasslands with some PJ mixed	7
10-Great Basin Grasslands	3
11-Ponderosa Pine-Pinyon/Juniper Transition Woodland	15
12-Ponderosa Pine-Alligator Juniper-Pinyon/Juniper	9
13-Ponderosa Pine-Pinyon/Alligator Juniper and Evergreen Oak Forest	10
15-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	6
16-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	4
17-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	2
18-Ponderosa Pine-Gambel Oak Forest	5
19-Ponderosa Pine-Gambel Oak Forest	6
20-Ponderosa Pine-Gambel Oak Forest	4

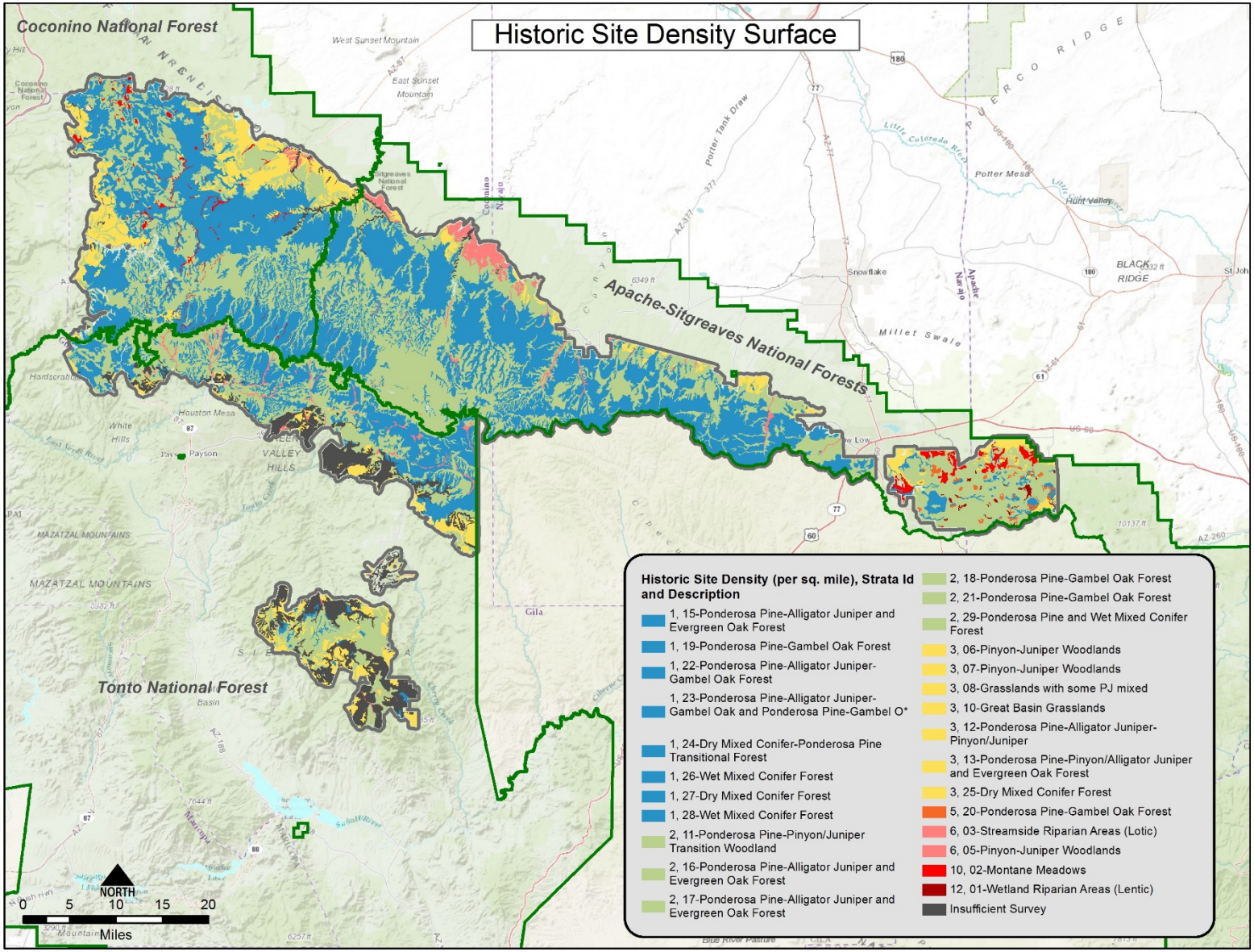
21-Ponderosa Pine-Gambel Oak Forest	2
22-Ponderosa Pine-Alligator Juniper-Gambel Oak Forest	7
23-Ponderosa Pine-Alligator Juniper-Gambel Oak and Ponderosa Pine-Gambel Oak	8
24-Dry Mixed Conifer-Ponderosa Pine Transitional Forest	5
25-Dry Mixed Conifer Forest	1
26-Wet Mixed Conifer Forest	0
27-Dry Mixed Conifer Forest	0
28-Wet Mixed Conifer Forest	0
29-Ponderosa Pine and Wet Mixed Conifer Forest	3

Historic/Multiple

Strata	Sites Per Sq. Mile
01-Wetland Riparian Areas (Lentic)	12
02-Montane Meadows	10
03-Streamside Riparian Areas (Lotic)	6
05-Pinyon-Juniper Woodlands	6
06-Pinyon-Juniper Woodlands	3
07-Pinyon-Juniper Woodlands	3
08-Grasslands with some PJ mixed	3
10-Great Basin Grasslands	3
11-Ponderosa Pine-Pinyon/Juniper Transition Woodland	2
12-Ponderosa Pine-Alligator Juniper-Pinyon/Juniper	3
13-Ponderosa Pine-Pinyon/Alligator Juniper and Evergreen Oak Forest	3
15-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	1
16-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	2
17-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest	2
18-Ponderosa Pine-Gambel Oak Forest	2
19-Ponderosa Pine-Gambel Oak Forest	1
20-Ponderosa Pine-Gambel Oak Forest	5
21-Ponderosa Pine-Gambel Oak Forest	2
22-Ponderosa Pine-Alligator Juniper-Gambel Oak Forest	1

23-Ponderosa Pine-Alligator Juniper-Gambel Oak and Ponderosa Pine-Gambel O*	1
24-Dry Mixed Conifer-Ponderosa Pine Transitional Forest	1
25-Dry Mixed Conifer Forest	3
26-Wet Mixed Conifer Forest	1
27-Dry Mixed Conifer Forest	1
28-Wet Mixed Conifer Forest	1
29-Ponderosa Pine and Wet Mixed Conifer Forest	2


Prehistoric Site Density Surface
Coconino National Forest
Apache-Sitgreaves National Forests
Tonto National Forest
Sites Per Sq. Mile, Strata Description
0, 27-Dry Mixed Conifer Forest
0, 26-Wet Mixed Conifer Forest
0, 28-Wet Mixed Conifer Forest
1, 25-Dry Mixed Conifer Forest
2, 17-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest
2, 21-Ponderosa Pine-Gambel Oak Forest
3, 29-Ponderosa Pine and Wet Mixed Conifer Forest
3, 10-Great Basin Grasslands
4, 01-Wetland Riparian Areas (Lentic)
4, 02-Montane Meadows
4, 16-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest
4, 20-Ponderosa Pine-Gambel Oak Forest
5, 18-Ponderosa Pine-Gambel Oak Forest
5, 24-Dry Mixed Conifer-Ponderosa Pine Transitional Forest
6, 15-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest
6, 19-Ponderosa Pine-Gambel Oak Forest
7, 08-Grasslands with some PJ mixed
7, 22-Ponderosa Pine-Alligator Juniper-Gambel Oak Forest
8, 23-Ponderosa Pine-Alligator Juniper-Gambel Oak and Ponderosa Pine-Gambel Oak
9, 12-Ponderosa Pine-Alligator Juniper-Pinyon/Juniper
10, 13-Ponderosa Pine-Pinyon/Alligator Juniper and Evergreen Oak Forest
12, 03-Streamside Riparian Areas (Lotic)
15, 11-Ponderosa Pine-Pinyon/Juniper Transition Woodland
22, 06-Pinyon-Juniper Woodlands
34, 07-Pinyon-Juniper Woodlands
38, 05-Pinyon-Juniper Woodlands
Insufficant Survey
NORTH
0 5 10 15 20
Miles


Historic Site Density Surface
Coconino National Forest
Apache-Sitgreaves National Forests
Tonto National Forest
Historic Site Density (per sq. mile), Strata Id and Description
1, 15-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest
1, 19-Ponderosa Pine-Gambel Oak Forest
1, 22-Ponderosa Pine-Alligator Juniper-Gambel Oak Forest
1, 23-Ponderosa Pine-Alligator Juniper-Gambel Oak and Ponderosa Pine-Gambel O*
1, 24-Dry Mixed Conifer-Ponderosa Pine Transitional Forest
1, 26-Wet Mixed Conifer Forest
1, 27-Dry Mixed Conifer Forest
1, 28-Wet Mixed Conifer Forest
2, 11-Ponderosa Pine-Pinyon/Juniper Transition Woodland
2, 16-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest
2, 17-Ponderosa Pine-Alligator Juniper and Evergreen Oak Forest
2, 18-Ponderosa Pine-Gambel Oak Forest
2, 21-Ponderosa Pine-Gambel Oak Forest
2, 29-Ponderosa Pine and Wet Mixed Conifer Forest
3, 06-Pinyon-Juniper Woodlands
3, 07-Pinyon-Juniper Woodlands
3, 08-Grasslands with some PJ mixed
3, 10-Great Basin Grasslands
3, 12-Ponderosa Pine-Alligator Juniper-Pinyon/Juniper
3, 13-Ponderosa Pine-Pinyon/Alligator Juniper and Evergreen Oak Forest
3, 25-Dry Mixed Conifer Forest
5, 20-Ponderosa Pine-Gambel Oak Forest
6, 03-Streamside Riparian Areas (Lotic)
6, 05-Pinyon-Juniper Woodlands
10, 02-Montane Meadows
12, 01-Wetland Riparian Areas (Lentic)
Insufficient Survey
NORTH
0 5 10 15 20
Miles

Conclusion

The site density surfaces identify how many sites per square mile one can expect to be within a given aggregated TEU. Its utility is to provide land managers with a tool to identify areas with lower or higher site densities when considering various treatments in support of the Rim Country EIS.

GIS Data

The data are posted here
https://ems-team.usda.gov/sites/fs-r03-hp/4friteamsite/_layouts/15/start.aspx#/SitePages/Home.aspx

HeritageDensityModel.zip

RimCountryHeritageSiteDensity.gdb
SiteDensitySurfaces: use the layer files to symbolize the Historic and Prehistoric Surfaces
Sites: create a definition query to select the PRE/MUL or HIS/MUL sites
Survey: single survey coverage

Historic Site Density Surface.lyr use this to see the historic site density surface

Prehistoric Site Density Surface.lyr use this to see the prehistoric site density surface

Appendix B

REGION 3 PA, APPENDIX J
STANDARD CONSULTATION PROTOCOL
FOR LARGE-SCALE FUELS REDUCTION, VEGETATION TREATMENT,
AND HABITAT IMPROVEMENT PROJECTS

The USDA Forest Service (FS) and other federal land managing agencies are directed by Congress to implement an accelerated, multi-year program of large-scale hazardous fuels reduction, vegetation treatment, and habitat improvement projects under a variety of legislation including the Healthy Forests Restoration Act of 2003 and the American Recovery and Reinvestment Act of 2009 (ARRA).

Improving forest health, reducing the threat of catastrophic wildfire to communities and forests across the landscape, and moving the nation closer to energy independence through the use of woody biomass will provide jobs, a primary emphasis of ARRA.

The Federal Fire Policy emphasizes that wildland fire is a critical natural process that must be reintroduced into the ecosystem. Currently, unmanaged fuel loads in many areas support large, hot, uncontrolled, and devastating wildfires that destroy life and property, including historic properties. Mechanical treatments, such as thinning and timber sales, in combination with prescribed fire will reduce fuel loading and stand density in areas adjacent to the Wildland Urban Interface, for example, so that wildfires approaching these areas will "go to the ground" where they can be effectively and safely suppressed.

Fuels reduction projects and other vegetation treatment and habitat improvement projects will also help protect historic properties from the devastating effects of catastrophic wildfires and the associated suppression activities and subsequent erosion. Although beneficial to historic properties over the long-term, these projects are undertakings that have the potential to affect historic properties, particularly fire-sensitive sites, and steps should be taken to avoid or minimize those effects.

Stipulation IV.A.4 of the Region 3 *First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities* (Programmatic Agreement) provides for the development of "Standard Consultation Protocols" for certain classes of undertakings where effects on historic properties and resulting protection and treatment are similar and repetitive. Such protocols specify standard procedures for the identification, evaluation, and treatment of historic properties. In accordance with the Programmatic Agreement, in developing this protocol the Forest Service consulted with the Arizona, New Mexico, Oklahoma, and Texas State Historic Preservation Officers (SHPOs), the Advisory Council on Historic Preservation (Council), and 50 Indian tribes for whom properties within National Forests might have traditional cultural or religious significance.

Once approved by the Forest Service, the Council, and the SHPOs and once formally incorporated into the Programmatic Agreement as Appendix J, the Forests may implement the procedures identified in this protocol in lieu of standard consultation procedures in the Programmatic Agreement or the Council's regulations, when taking into account the potential effects of these types of projects on historic properties. This protocol will fully supersede all provisions of the 2004 *First Amended Programmatic Agreement Among the USDA Forest Service, Southwestern Region, Arizona State Historic Preservation Officer, New Mexico State Historic Preservation Officer and The Advisory Council on Historic Preservation Regarding Wildland Urban Interface and Other Large-Scale Hazardous Fuels Reduction Projects.*

STIPULATIONS

The FS shall ensure that the following stipulations are carried out:

1. SCOPE. This protocol covers ARRA projects, WUI projects, and other large-scale (larger than 1,000 acres) fuels reduction, vegetation treatment, and habitat improvement projects. Activities covered by the protocol include: hand thinning; mechanical thinning; use of equipment such as Hydro-ax, Agra-ax, brush crushers and brushhogs; timber sales; slash disposal, including lopping and scattering, chipping, pile burning, and windrow or jackpot burning; broadcast burning; and fuelwood use, including free use, fuelwood permits, and commercial fuelwood sales.

2. INTERNAL COORDINATION AND TRACKING. The FS shall ensure that heritage specialists are brought into the planning process for projects as early as possible so that the potential effects on cultural resources can be evaluated. The FS shall also ensure that a system is in place to track implementation of heritage resource protection and monitoring requirements, and that necessary communication and coordination between heritage and fuels treatment and/or other appropriate specialists will continue throughout the implementation of projects carried out under this protocol.

3. TRIBAL CONSULTATION. The FS shall follow the procedures for tribal consultation contained in Stipulation III of the Programmatic Agreement. As early as possible in the planning process, the FS shall consult with American Indian tribes to determine if any properties of traditional cultural or religious importance are present within the project's area of potential effect. If specific properties are identified, the FS shall consult with the appropriate tribes concerning evaluation, determination of effects, and protection measures. If agreement cannot be reached or if adverse effects cannot be avoided, the FS shall consult case-by-case with interested tribe(s) and the SHPO as provided for in the Programmatic Agreement.

4. PUBLIC INVOLVEMENT. The FS shall use the procedures in Stipulation II of the Programmatic Agreement to seek and consider the views of the public.

5. IDENTIFICATION. The Forest Archaeologist shall determine or approve the level of field survey for each project using the guidelines in Section I of this protocol. Alternatively, a Forest or Forests may opt to develop a Forest-wide survey strategy for WUI and other large-scale fuels reduction, vegetation treatment, or habitat improvement projects in consultation with the SHPO and thereby further eliminate the need for individual project notifications for sample surveys.

6. EVALUATION. The FS and the SHPOs agree that certain classes of properties (Appendix B of the Programmatic Agreement) may be determined eligible for the National Register of Historic Places for Section 106 purposes based on survey information without further case-by-case SHPO consultation. The FS shall ensure that properties that will be affected by an undertaking are evaluated conclusively for eligibility for inclusion in the National Register by applying the National Register criteria (36 CFR 63) in consultation with the SHPO and any Indian tribe that attaches religious and cultural significance to the properties. Forests are encouraged to make eligibility determinations for other properties in consultation with the SHPO whenever possible; however, the eligibility of a property may remain unresolved, provided it is treated as eligible and the property will not be affected by the undertaking.

7. EFFECT. Following completion of the survey approved by the Forest Archaeologist in accordance with Section I, the FS shall determine the effects of the project on historic properties:

a) No Historic Properties Affected. If no properties are identified within the area of potential effect or if properties are present and all eligible and unevaluated properties are avoided through application of the site protection measures in Section II, and provided that none of the conditions requiring case-by-case consultation specified in the Programmatic Agreement (Stipulation V.E.6) apply, a determination of "No Historic Properties Affected" will be made for the project in accordance with 36

CFR 800.4(d)(1). This will include only those projects in which a 100% survey is conducted and all eligible and unevaluated properties will be protected.

b) No Adverse Effect. If portions of the area of potential effect have not been surveyed because an approved sample survey strategy was implemented, or if eligible and/or unevaluated properties are present and will be affected, but through application of the protection measures in Section II potential adverse effects on eligible and unevaluated properties have been minimized to the extent that they do not meet the criteria of Adverse Effect contained in 36 CFR 800.5(a)(1), and provided that none of the conditions requiring case-by-case consultation specified in the Programmatic Agreement (Stipulation V.E.6) apply, a finding of "No Adverse Effect" will be made for the project in accordance with 36 CFR 800.5(b).

c) Adverse Effect. If the Forest Archaeologist determines that one or more properties may be adversely affected, the FS shall consult case by case on the project in accordance with the Programmatic Agreement (Stipulation V.E.5 and 6).

8. PROTECTION. The Forest Archaeologist shall draw from the protection measures in Section II to ensure that effects on historic properties are avoided. Site protection requirements shall be documented in the inventory report and on the FS Inventory Standards and Accounting (IS&A) form.

9. MONITORING. Terms and conditions of Section 106 compliance shall include appropriate post-project monitoring requirements as determined necessary by the Forest Archaeologist, to assess the effectiveness of protection measures. One purpose of post-treatment monitoring is to gather data that will be used to improve planning for protection of heritage resources in future projects. For prescribed fires, Forests are encouraged to assess the effects of prescribed fire on both fire-sensitive and non fire-sensitive sites to expand available information on the effects of prescribed fire on historic properties. All site monitoring shall be documented on a site update form and/or monitoring report as appropriate. Each Forest shall maintain an updated list of sites/projects to be monitored which will include the date monitoring is completed and the monitoring results.

10. INVENTORY REPORT. Inventory reports shall conform to the Programmatic Agreement (Stipulation V.C.4). The FS shall also ensure that reports include a description of all planned activities, equipment to be used, expected impacts, and a detailed discussion and rationale for the survey strategy if less than 100%.

11. APPROVAL. When all of the above stipulations are complied with and the inventory report has been approved by the Forest Archaeologist, and provided that the undertaking will not have an adverse effect on historic properties and none of the conditions requiring case-by-case consultation specified in the Programmatic Agreement (Stipulation V.E.6) apply, the Forest Supervisor may approve the report and proceed with the undertaking, provided all site-specific protection measures are implemented. The Forest Supervisor shall forward a copy of the report, IS&A form, and associated site forms to the SHPO within 30 days, unless otherwise agreed to with the SHPO.

12. CASE-BY-CASE CONSULTATION. The FS shall follow the Programmatic Agreement (Stipulation V.E.6) for direction on when case-by-case consultation is necessary.

13. DISCOVERY SITUATIONS. There is the potential for encountering previously unrecorded properties or for affecting properties in an unanticipated manner during the course of these projects. Previously unrecorded properties that are encountered during the course of a project shall be documented and protected in the same manner as other properties, using the protection measures in Section II. If the FS determines that a property has been damaged, the FS shall halt all activities that could result in further

damage to the property and shall notify the appropriate SHPO concerning proposed actions to resolve adverse effects. The SHPO shall respond within 48 hours of notification. The FS shall carry out the agreed-upon actions. If human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered, the provisions of NAGPRA (25 USC 3002(d)) and NAGPRA regulations (43 CFR 10) shall be followed. All work in the immediate vicinity of the discovery shall stop, and the FS shall take all reasonable steps necessary for the protection of the remains and objects.

14. PHASING. A phased approach should be used only when a large-scale project is to be implemented in phases spanning more than one fiscal year and it is not reasonably possible to complete Section 106 compliance for all aspects of the undertaking prior to reaching a NEPA decision. Where deemed necessary by the Forest Supervisor, consultation for such a project may be carried out in two or more phases corresponding to the implementation phases of the project. In this phased approach, a final NEPA decision on the project may be made prior to completion of the identification and evaluation of properties in the entire project area provided that all of the following requirements are met:

a. none of the conditions in the Programmatic Agreement Stipulation V.E.6 apply to the project;
b. the requirements in Stipulations 2-8 in this protocol have been completed for the first phase of the project or a justification has been provided to the SHPO as to why completion of the first phase is not feasible;
c. an initial Section 106 compliance report and signed IS&A form are completed prior to the NEPA Decision and clearly state that the identification and protection requirements of this protocol shall be completed prior to the authorization of on-the-ground work in each phase of the project
d. the expected nature and distribution of properties in the entire project area and anticipated effects are discussed and considered in the initial project-wide Section 106 compliance report and in the NEPA analysis;
e. the protection measures in Section II will be sufficient to protect properties in the entire project area, and;
f. the NEPA decision document clearly states that initiation of work in any phase of the project will be contingent upon completion of the identification and protection of historic properties and compliance with applicable provisions of NHPA in accordance with this protocol.

If the FS subsequently determines that adverse effects on historic properties in any phase of the project cannot be avoided, the FS shall consult with the SHPO and other consulting parties in accordance with the Programmatic Agreement (Stipulation V.E.5 and 6) and will amend its decision if necessary to disclose the effects.

15. ANNUAL REVIEW. As part of the Annual Meeting carried out pursuant to the Programmatic Agreement (Stipulation XIII.D), the Forests, the SHPO, and the Council, if it chooses to participate, shall discuss the activities carried out pursuant to this protocol, re-evaluate its procedures, and determine whether continuation, modification, or cancellation is appropriate.

16. REVISIONS AND AMENDMENTS. Any signatory to this protocol may request that it be revised or amended, whereupon the parties shall consult to consider the change. Changes may be made by written consent of the Regional Forester, SHPOs, and Council after appropriate consultation.

17. TERMINATION. Any signatory to this protocol may terminate it by providing thirty (30) days notice to the other parties. The signatories will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. In the event of termination, the FS shall comply with the Region's Programmatic Agreement, or 36 CFR 800, with regard to individual undertakings that otherwise would be covered by this protocol. Termination by an individual SHPO shall only terminate the application of the protocol within the jurisdiction of that SHPO.

18. EXECUTION. Execution and implementation of this protocol satisfies the Forest Service's Section 106 responsibilities for all WUI and ARRA projects and other large-scale fuels reduction, vegetation treatment and habitat improvement projects in the Region that are treated in conformance with the stipulations herein.

19. IMPLEMENTATION. This protocol becomes effective on the date of the last signature below and will be implemented immediately.

SIGNATURES:

_/s/ Corbin L. Newman Jr._____ _12/23/2009_____
Corbin L. Newman Jr., Regional Forester Date
USDA Forest Service, Southwestern Region

_ /s/ James W. Garrison_____ _1/22/2010_____
James W. Garrison, State Historic Preservation Officer Date
State of Arizona

_/s/ Jan Biella_____ _1/4/2010_____
Jan Biella, Interim State Historic Preservation Officer Date
State of New Mexico

_/s/ Bob Black_____ _2/12/2010_____
Bob L. Blackburn, State Historic Preservation Officer Date
State of Oklahoma

_/s/ Mark Wolfe_____ _1/14/2010_____
Mark Wolfe, State Historic Preservation Officer Date
State of Texas

_/s/ Ralston Cox_____ _1/27/2010_____
for John M. Fowler, Executive Director Date
Advisory Council on Historic Preservation

APPENDIX J
SECTION I

HERITAGE RESOURCE SURVEY STRATEGIES
FOR LARGE-SCALE FUELS REDUCTION, VEGETATION TREATMENT,
AND HABITAT IMPROVEMENT PROJECTS

The following guidelines will be used to determine survey strategies under this protocol.

Pre-field Research

The Forests will utilize relevant information to assess the project's potential to affect heritage properties and the expected nature and distribution of historic properties that may be affected.

Expected nature and severity of project impacts (this should include consideration of all planned activities and entries) based on:

- type and intensity of mechanical treatment
- type and intensity of prescribed burn, including fuel loading and fire prescription
- type and intensity of fuelwood use
- other associated ground disturbing activities

Expected nature and distribution of heritage resources based on:

- heritage GIS survey and site layers or hard-copy survey and site atlases
- previous heritage reports and site forms
- cultural resource overviews and planning assessments
- information obtained through tribal consultation and public input
- information provided by other resource specialists familiar with the project area
- topographic maps, aerial photographs, ortho-photo quads
- other available GIS layers and maps including soils, vegetation type, slope
- determination of known/expected fire-sensitive sites

Field Survey

Not all situations will require 100% survey. In most cases, the Forest Archaeologist will be able to determine the level of survey needed based on the following guidance. Where not specifically required below, forest archaeologists are encouraged to discuss sampling survey designs with SHPO. The following will guide the identification of areas selected for survey and the level of survey coverage.

1. Areas previously surveyed to current standards, as defined in paragraph V.C.2 of the Programmatic Agreement, do not have to be resurveyed.

2. Activities conducted on slopes greater than 40% may or may not be surveyed at the discretion of the Forest Archeologist without prior SHPO consultation.

3. For activities conducted within areas that were previously disturbed by chaining, discing, plowing, windrowing, crushing, or other extensive ground disturbing treatments, a sample survey strategy may be approved by the Forest Archaeologist without prior consultation with the SHPO. The nature, degree and extent of previous ground disturbing activities and the likelihood of finding cultural resources or locations within the treated areas that remain undisturbed shall be considered when making the decision to survey at less than 100%. This information will be documented and discussed in the survey report.

4. Hand thinning. Activities involving hand cutting and /or thinning, with no use of mechanized equipment and no follow-up prescribed burning, are low impact activities, and may or may not be surveyed at the discretion of the Forest Archeologist without prior SHPO consultation.

5. Prescribed burns. Surveys for prescribed burn areas will include all locations likely to contain fire-sensitive sites based on pre-field research, expected fire behavior, and other relevant data. Additional survey may be conducted at the Forest Archeologist's discretion. The survey strategy shall identify the types of sites that are considered fire-sensitive for each prescribed burn area, using the guidelines in

Section III of this protocol. This should include both known fire-sensitive sites and other sites considered fire-sensitive for the specific burn based on fuel loading, site characteristics, and expected fire behavior. If existing inventories indicate the presence or likelihood of fire-sensitive properties throughout the area of potential effect, the area will be surveyed 100% or a proposed sample survey strategy will be submitted to the SHPO for review in accordance with the Programmatic Agreement (Stipulation V.C.3).

6. Other Fuels Reduction, Vegetation Treatment, and Habitat Improvement Projects. Except for the provisions in 1 through 3 above, all high impact treatments resulting in intensive ground disturbance that would likely adversely affect any historic properties that may be located in the area of potential effect will receive 100% survey. These treatments include but are not limited to:

- construction of roads, landings and skid trails
- intensive mechanical treatments: machine piling, windrowing, chaining, plowing, mechanical crushing
- clearcuts
- timber sale cutting units
- hand and mechanical fire line construction
- staging areas
- constructed safety zones
- installation of water bars and other constructed erosion control features

For other mechanical fuels reduction, vegetation treatment, and habitat improvement projects with potential impacts that are not considered to be high impact treatments, including but not limited to pre-commercial thinning of small diameter trees and fuelwood areas dispersed over a large area (e.g. District-wide), a sample survey strategy may be approved by the Forest Archaeologist without prior consultation with the SHPO if existing inventories indicate the site density in the area of potential effect is lower than the average site density for the forest and the level of impact is such that the Forest Archaeologist determines that it is unlikely that any historic properties that may be present outside the surveyed areas will be adversely affected by the activity. Information concerning the nature of the undertaking, site density, and evaluation of potential effects that led to this determination will be discussed in the survey report. If existing inventories do not indicate the site density is lower than the forest average, or if the Forest Archaeologist determines that the undertaking will result in intensive ground disturbance, the areas will be surveyed at 100%, except for the provisions in 1 through 3 above, or a proposed sample survey strategy will be submitted to the SHPO for review in accordance with the Programmatic Agreement (Stipulation V.C.3).

7. Any deviation from the above survey procedures that involves less than 100% survey will require prior SHPO consultation in accordance with the Programmatic Agreement (Stipulation V.C.3).

APPENDIX J
SECTION II

AGREED-UPON STANDARD SITE PROTECTION MEASURES

Various combinations of the following protection measures may be approved by the Forest Archaeologist to protect sites for projects listed in this protocol without additional SHPO consultation.

<u>Prescribed Burning</u>

Protect fire-sensitive sites:

- Exclude from project area
- Hand line
- Black line
- Wet line
- Foam retardant
- Structural fire shelter
- Remove heavy fuels from site by hand
- Prevent in-situ heavy fuels that cannot be removed from ignition (e.g., flush-cut & bury stumps)
- Implement same protective measures for future maintenance burns.

Protect selected other sites from burning (optional).

Allow burning over non fire-sensitive sites provided:

- No ignition points within site boundaries
- No staging of equipment within site boundaries
- No slash piles within site boundaries.

Allow construction of safety zones and additional lines in 100% surveyed areas, with archaeological monitoring as appropriate to assure historic properties are avoided.

Thinning, Hand and Mechanical Treatments

No treatments or ground disturbance within site boundaries -or-

Allow treatments within site boundaries, provided:

- Cutting is accomplished using hand tools only
- Large diameter trees are felled away from all features
- materials removed from the site are removed by hand
- No dragging of logs, trees, or thinned material across or within site boundaries.

No use of vehicles or other mechanized equipment within site boundaries.

No staging of equipment within site boundaries.

No slash piles within site boundaries.

Fuelwood Sales

No fuelwood cutting or vehicles within site boundaries -or-

Allow fuelwood cutting within sites provided that:

- no vehicles allowed within site boundaries
- No dragging of logs, trees, or cut material across or within site boundaries
- materials removed from the site are removed by hand.

Allow fuelwood cutting in areas of large, continuous, low-density artifact scatters that cover large portions of a landscape provided that:

- all features and artifact concentrations are recorded and avoided
- use of vehicles is prohibited during wet ground conditions

- periodic monitoring is used to assess impacts and if impacts are noted, fuelwood cutting will be prohibited in the area.

The Forest Archaeologists may approve additional measures to further protect sites.

APPENDIX J

SECTION III

FIRE-SENSITIVE SITES

A review of available literature on the effects on fire on cultural resources and on the experience of Forest Service heritage resource specialists and the SHPO indicates that there are two categories of fire-sensitive sites. The first consists of sites long-known to be vulnerable to the effects of even low-temperature fires and/or light fuel loads, such as sites that contain organic materials, exposed wooden architecture, etc. The second group includes sites that have generally been considered to have less risk for fire effects in most situations, including prehistoric and historic sites with deeply buried cultural deposits; prehistoric and historic artifact scatters; and prehistoric and historic sites with non-flammable surface features. However, depending on field conditions -- especially fuel loading -- as well as specific site characteristics and expected fire behavior, these other site types may be fire-sensitive in certain fuels reduction projects.

Known Fire-Sensitive Site Types in the Southwestern Region:

- Historic sites with standing, or down wooden structures or other flammable features or artifacts
- Rock art sites (depending on rock type, exposure, fuel type, and fuel loading)
- Cliff dwellings
- Prehistoric sites with flammable architectural elements and other flammable features or artifacts
- Prehistoric sites with exposed building stone of soft or porous material such as volcanic tuff
- Culturally modified trees, including aspen art and peeled/scarred trees
- Certain traditional cultural properties (based on consultation with tribes)

Other Project-Specific Fire-Sensitive Sites:

- Other sites, based on local field conditions and Forest-specific concerns
- Other sites, based on consultation with SHPO staff
- Other sites, based on consultation with fire management staff, fire behavior specialists or fire effects researchers

Forest Archaeologists will use site assessment and monitoring data, and will consult with fire management staff, to identify known and other project-specific fire-sensitive sites for individual Forests or project areas. Fire-sensitive sites officially determined ineligible for the National Register of Historic Places do not require protection under Section 106.

APPENDIX J
SECTION IV

DEFINITIONS

1. **Black Line**. A fireline created by burning the organic matter and then extinguishing the fire.

2. **Broadcast Burn**. Broadcast burning uses fire over a designated area to consume natural or activity slash that has not been piled or windrowed. Broadcast burning may be used separately or in conjunction with mechanical methods such as thinning. Broadcast burns may be ignited by hand, by "terra-torches", torches mounted on 4-wheelers or on a flat-bed truck, or with aerial ignition. Preparation for the burn may include line building, both by hand and machine.

3. **Burn Plan**. A detailed plan for conducting a prescribed burn that identifies the burn units, fire control methods, and weather condition criteria.

4. **Chipping** - In the chipping process, slash is forced through a chipping machine, reducing the larger pieces of slash to small chips that are spread over the site to be burned at a later date, or left on site to naturally decompose

5. **Crushing** - Crushing involves dragging a large drum with protruding spokes or spikes over the vegetation, effectively breaking the fuel into smaller pieces. Another form of crushing uses a "brush crusher" in which a piece of equipment similar to a "weed-whacker" is attached to a tractor. The "brush crusher" is able to reduce the height of vegetation from 4' to 6' down to 6" in height. Both of these pieces of equipment are pulled or transported by either rubber tire tractors, or rubber or metal track dozers. The "brush crusher" may operate on up to a 60% slope.

6. **Federal Fire Policy**. The *Federal Wildland Fire Management Policy* signed by the Secretaries of Agriculture and Interior following the 1994 wildfire season. The Federal Fire Policy guides and provides for the coordination of fire management activities of the of the Forest Service, National Park Service, Bureau of Indian Affairs, Bureau of Land Management, U.S. Fish and Wildlife Service and the National Biological Service.

7. **Fire Prescription**. Measurable criteria that define conditions under which a prescribed fire may be ignited, set prescriptive parameters (rate of spread, intensity, flame length, etc.), guide selection of appropriate management response, and indicate other required actions.

8. **Fireline**. A narrow, linear strip, cleared of vegetation to dirt that inhibits and/or contains the spread of fire. Firelines vary in width from one foot to over 10 feet, with most being two feet wide or less.

9. **Fuel loading**. The nature and amount of accumulated fuels which contribute to the intensity and duration of a fire.

10. **Fuelbreak**. An area adjacent to or surrounding a Wildland Urban Interface area or other protected area, where thinning and other treatments are used to substantially reduce hazardous fuels. Fuelbreaks will vary in width according to the fuel profile and topography.

11. **Hazardous Fuels Reduction**. Activities to decrease fuel loading and stand density to a manageable degree to reduce crown fires. Treatments include creation of fuelbreaks, thinning, and disposal of fuelbed materials using mechanical or non-mechanical means.

12. **Hydro-Ax and Agra-Ax** - The Hydro-ax and Agra-ax are large cutting tools attached to a "Bobcat" type tractor. They are used in the pinyon/juniper type, cutting trees off at the ground level. The trees are usually left to lay where they fall, assisting in soil retention.

13. **Inventory Standards and Accounting (IS&A) Form**. FS form (R3-FS-2300-4) which serves as the cover sheet for inventory reports and includes conditions of Section 106 compliance, such as site specific protection measures and monitoring requirements.

14. **Lopping and Scattering** - Thinned areas not piled may be "lopped" to reduce fuel slash heights and then broadcast burned. Lopping consists of cutting smaller branches off the main stem so the height of the slash layer is reduced, which in turn allows for a less intense fire if the area is broadcast burned.

15. **National Fire Plan**. The report, *Managing the Impacts of Wildfires on Communities and the Environment, A report to the President in Response to the Wildfires of 2000*, prepared by the Secretaries of Agriculture and Interior. The report calls for action and funding in five key areas: Firefighting; Restoration and Rehabilitation of Burned Areas; Hazardous Fuels Reduction; Community Assistance; and Coordination and Monitoring.

16. **Pile Burning** - Pile burning disposes of hand or machine-piled slash. Piling the slash and burning during cooler, wetter, or winter conditions reduces the chance of escape and lessens the potential for damage to the remaining vegetation on site. Piles are normally ignited by hand using fuses or drip torches.

17. **Prescribed Burn**. A prescribed fire ignited by management to meet specific objectives. A prescribed burn may involve broadcast burning over an entire area or burning of thinning slash that has been piled or windrowed.

18. **Thinning**. Thinning reduces stand density by removing stems in the understory, midstory, and overstory. Thinning actions will vary between fuelbreaks and areas surrounding fuelbreaks.

    - PRECOMMERCIAL THINNING – Pre-commercial thinning involves hand thinning of smaller diameter materials. Small material will be piled, while larger material will be utilized for personal fuelwood or sold for commercial fuelwood. Piles will be burned in the fall and winter season and potentially during the summer if conditions become suitable. The actual piling of the material may be accomplished by hand or machine, where equipment such as dozers and small tractors will haul the material to piles. Slash is also pushed or dragged into windrows. Some slash may be "rough-piled" or "jackpot piled" where heavier concentrations of fuel are left where they fall and are burned on site.

    - COMMERCIAL THINNING – Commercial thinning, accomplished through timber sales, involves larger materials. Material that is large enough for commercial thinning (merchantable timber), may be removed to a landing using a rubber-tire skidder, or tracked vehicle. Where slopes exceed 30%, tracked skidders are used more frequently because of their maneuverability. Whole tree skidding methods move the entire tree to the landing, and then remove the branches, concentrating the slash where it can be utilized as fuelwood or burned.

19. **Wetline**. A fire line constructed using water or foam, intended to prevent the advance of fire.

20. **Wildfire**. An unwanted wildland fire.

21. **Wildland fire**. Any non-structure fire, other than prescribed fire, that occurs on undeveloped land.

22. **Wildland Urban Interface**. Those areas of resident populations of imminent risk from wildfire, and human developments having special significance. These latter areas may include critical communications sites, municipal watersheds, high voltage transmission lines, observatories, church camps, scout camps, research facilities, and other structures that, if destroyed by fire, would result in hardship to communities. These areas encompass not only the sites themselves, but also the continuous slopes and fuels that lead directly to the sites, regardless of the distance involved.

Appendix C

A STRATEGY FOR PROTECTING HISTORIC PROPERTIES WITHIN EXISTING DIRT ROADS FOR PROJECTS WITHIN THE FOUR FOREST RESTORATION INTIATIVE AREA

INTRODUCTION

This protocol proposes standard documentation and treatment measures, and consultation procedures for classes of actions taken to protect cultural resources within existing roads within the area being treated under the Four Forest Restoration Initiative (4FRI). The objective of this strategy will be to manage transportation on existing roads during 4FRI implementation that cross historic properties with outcomes that will result in protection and stabilization of cultural deposits within roads, so as to prevent adverse effects on archaeological sites from road use and maintenance.

ROADS AND TRAVEL: RATIONALE FOR PLATING SITES WITHIN EXISTING ROADS

The problem of managing cultural resource deposits within existing dirt roads of the Forest Service road system is a longstanding challenge. With the mandate to implement the 4FRI on the Kaibab, Coconino, Apache-Sitgreaves and Tonto National Forests, this challenge is related to the maintenance or reconstruction of existing forest roads that will be used as haul and access routes associated with the restoration activities within the 4FRI restoration areas. There are known sites within in our roads systems being used under 4FRI, and it is a priority to protect these sites from potential adverse effects associated with road use and maintenance that involves heavy machinery. In some cases, plating serves as a viable, cost-effective, and time-efficient option that serves to protect cultural resources within roads. Plating, as it elevates a road surface, will assist in road drainage and discourage other vehicles, mainly the public, from circumnavigating these road segments and driving 'off road' and into archaeological sites.

Generally, conflicts arise with cultural resources within existing dirt roads that are known as Maintenance Level I, or II roads. These are roads that are not maintained or are minimally maintained by the Forest Service and do not have a history of previous maintenance for high levels of use. Level I roads are typically closed to the public but may be minimally maintained for administrative or non-motorized uses. Maintenance Level I roads may be two-track or graded roads or even paved roads, but due to being closed, often require considerable maintenance to bring them back into use. Level II roads are usually known as high-clearance unpaved dirt roads not suitable for standard passenger cars. Level III roads tend to be wide and well-maintained, and Level IV and V roads are generally surfaced or paved (USDA 2005). Level I and II roads may be proposed for a higher maintenance or development level as a result of projects such as timber sales, or for purposes of increasing road quality through design and drainage.

A major problem with such lower maintenance level roads include impact associated with drainage, such as puddle formation saturation resulting in slippery conditions and rutting, which often result in road widening or the creations of new parallel road to avoid these hazards. When this type of road creep occurs within an archaeological site, the effects can be disastrous and results in the destruction of the resources. Plating roads through sites ensures that impacts remain above the site surface and improves chances that casual/recreational road users will remain within the existing road prism. Previous treatments of sites using plating within existing dirt roads has proven to be a successful option for preventing damage to remaining portions of sites by road. It further protects sites potentially subjected to heavy use by haul

trucks and additional traffic by more effectively distributing weight across the road and preventing erosion and deterioration of cultural deposits. This is a cost-effective strategy to protect and stabilize sites (Wagner et al. 2007). In such cases, the use of plating to raise roadbeds through sites minimizes contact between equipment and sites, and also distributes weight and wear across non-site materials. Such techniques serve essentially to bury and protect a portion of a site *in situ.* This is a method archaeologists have successfully implemented in past consultations with the State Historic Preservation Office and tribes (Lyndon 1998; Sorrell 2002; Weintraub 1999, 2008, 2011).

ROAD PLATING

The proposal is to allow the use of plating to protect historic properties as described below. For the purposes of this strategy, plating is defined as the act of covering cultural remains exposed within a road prism using soil alone or in combination with a geotextile material, covering with steel plate or other types of protective covering. In general, avoidance of the site from road maintenance should be the desired option. Rerouting of the road to avoid the site combined with remediation of the original road segment through the site should also be a strong option. However, there are situations where rerouting cannot occur, and data recovery is too expensive and too invasive, therefore, plating is a viable option. This strategy will be applied in cases deemed appropriate where sites exist within Level I and Level II roads proposed for continued use or for upgrade to more intensive uses such as timber and material hauling. Other site treatments, as conditions warrant, may be selected if more appropriate, and would be the subject of case-by-case consultation between the Forest Service and SHPO and the Tribes.

The list below covers road plating of historic properties including properties whose status is unevaluated but are treated as eligible. There are two different scenarios for road plating:

1. To maintain traffic within the existing road prism.

   Archaeological sites often extend well beyond the confines of the existing road prism, which includes the road bed (road surface), associated drainage features such as bar and lead off ditches and culverts, water crossing, cut banks, shoulders, etc. The road bed is often of poor quality and may be in an area that has poor drainage or other attributes that contribute to rutting. This situation encourages drivers to diverge from the original road, but the same soil characteristics often occur there as well, so that eventually a 10-foot-wide road may become a 50-foot-wide or wider morass. If an archaeological site is within this morass, its integrity is almost certainly compromised. Therefore, the primary purpose of road plating in this situation is to restrict and encourage vehicular traffic to remain within the existing road and avoid disturbing relatively unaltered portions of the site. Plating for this type of situation, where the site's integrity within the road prism has been seriously compromised, will not require geotextile or the same level of design as other intentional site burials. A common strategy may simply consist of carefully placing material over the disturbed site to stabilize the road bed and discourage motorized use outside the road prism.

2. To protect known exposed cultural features.

   Occasionally, cultural features may be exposed in a road prism. The Forest Archaeologist, in consultation with the SHPO and Tribes, should decide whether plating, including the use of geotextile fabric, or data recovery, is the most effective option. Where plating is appropriate, consideration of potential changes in soil moisture retention and chemical reaction should be taken into account. Additional consideration should be given to incorporating the use of geotextiles to distinguish the feature from the plating deposits and to aid in recognition during

future road maintenance activities. If data recovery is proposed, Forests shall consult with SHPO and Tribes under the provisions of the 2003 Region 3 Amended Programmatic Agreement.

Plating Procedures

The steps outlined below should be considered a general response to a "typical" site, with some variation in the procedure as needed. Regardless of what is outside the road prism, there may be the likelihood or known presence of subsurface cultural deposits within the road prism. The soil characteristics should be taken into consideration as well as the planned undertaking.

A conditional No Adverse Effect finding would apply when these procedures are followed:

1. The portion of the site in the road to be plated must be thoroughly documented to current professional standards (e.g., artifacts and features should be counted, typed, mapped, photographed and scale drawn as appropriate). If the plated area is large (circa 10 m^2) and/or if artifact concentrations are encountered, documentation should be based on sample analysis. Unless an important diagnostic artifact could be damaged by plating pressure, all artifacts should be left in place after field analysis.

2. Decisions on the nature of surface and subsurface cultural materials, soil integrity, and traffic density, should be used to determine the extent and type of coverage needed. In some cases, e.g., where there are intact surface and subsurface deposits, it may be advisable to cover the entire area to be plated with geotextile fabric. However, geotextile fabric may not be the best solution for protecting underlying cultural material because of moisture retention, ongoing maintenance, and it may draw attention to the site. An advantage of geotextile is that it can serve to delineate the difference between the original exposed surface and the fill, and it can help facilitate removal of the fill if it is ever deemed necessary. In other cases, e.g., where bedrock or sterile substrates are exposed, and only some areas exhibit surface artifacts or cultural deposits, it may be that only those portions of the site with cultural deposits would be covered with geotextile. Where the cultural deposits in the roadbed are substantially disturbed, or the road has been cut below the cultural layer, no geotextile covering at all may be necessary between the roadbed and the plating material. At minimum, however, any evident surface features should be photographed, scale-drawn, geolocated, and be covered with non-biodegradable geotechnical cloth prior to being covered with plating material.

3. Plating material should be from a culturally sterile, observably different material source than that of the parent material based on appropriate engineering characteristics and yet chemically neutral so that it does not harm sensitive artifacts (see Thorne 1991: Figure 1). Plating material should be sufficiently deep and cohesive enough to sustain all anticipated loads for the undertaking, and provide for additional operations and maintenance of the roads, should subsequent use for logging by large/heavy machinery for forest management operations in the area be required.

4. A Forest Service or professional archaeologist, under permit, must be present for monitoring the plating work through the site.

5. Once plated, routine maintenance can occur upon the surface of the raised road bed, but no maintenance or other work with heavy equipment may occur outside the road prism, within the site boundaries, without heritage survey and clearance. Routine maintenance must be conducted in a

manner to ensure the plating material is not removed from the roadbed, and maintenance does not disturb the cultural deposit.

6. If any proposed activities begin to adversely affect sites (either within or outside the plated road prism), or if any human remains are observed, all activities within site boundaries will immediately cease and consultation with the Forest Archaeologist, SHPO, and consulting Tribes will be initiated pursuant 36 C.F.R 800.13 and NAGPRA. Where traffic cannot be removed from the road, expedited consultation will be initiated to determine if data recovery and/or a temporary reroute is necessary. The cultural resources will be protected until an appropriate course of action is determined.

7. If a road prism is to be expanded or the road rerouted around a site, the standard Section 106 procedures outlined the 2003 Region 3 Amended Programmatic Agreement would take effect.

MONITORING AND POST-PLATING INSPECTION PROCEDURES

A Forest Service or professional archaeologist, under permit, shall monitor the plating project. An archaeologist shall also inspect each plated road area periodically (initially at least once per year) to determine if the plating material maintains its integrity or whether any deterioration of the material or rutting in the roadbed had occurred. Once it has been determined that the plating is effective and not degrading, inspections may occur less frequently. Additionally, the sites will be inspected to ascertain if the plating is adequately protecting the site, and to determine whether any road creep, off-road excursions, or other vehicle-related site damage has occurred.

If the site has been disturbed or conditions have changed such that disturbance is likely, the Forest should determine in consultation with the SHPO, and consulting tribes if appropriate, the appropriate treatment measures.

REPORTING REQUIREMENTS

Reporting implementation under this strategy can occur in two ways. If the plating takes place as part of a ground disturbing undertaking, include the plating information in the Section 106 report and follow the normal consultation process described in the 2003 Amended Programmatic Agreement for the undertaking. In this case, the plating itself will not be the only subject of the Section 106 consultation.

If the plating is a stand-alone project, it will require a separate report that documents the plating activity. Then submit the report to the SHPO at the end of each fiscal year that includes a summary of the activities carried out under this strategy and the results of any associated monitoring and post-plating inspection activities. All plating activity reporting will help to guide the implementation of any necessary changes to this strategy as a result of observations made during post-plating inspections.

The report the plating activities will include the following observations:

a. Type of plating work conducted (materials, depths, etc.), and rationale,
b. Artifact analysis and feature documentation results,
c. A thorough description of the plating, including materials used,
d. Any recommendations for future maintenance of plating materials (e.g., lift blade of road grader on plated portion when conducting road maintenance; adding additional

plating materials if the maintenance activities have reduced the level of the plating material, or adding a different more durable material.

e. Discussion of monitoring program used during implementation and the results of archaeological monitoring.
f. Discussion of results of the post-plating inspections.

CONCLUSION

If the 4FRI Forests adhere to the provisions outlined in this strategy, then the plating of roads through sites will meet the criteria of the 2003 Amended Programmatic Agreement of no adverse effect to historic properties or unevaluated sites and treated as eligible for Section 106 purposes, and will serve as a programmatic standard protection measure suitable for use in the cases described above.

Not all, and probably very few, sites will actually need plating, and it should never be considered to be a routine procedure. Only sites that have been determined eligible or to be treated as eligible for Section 106 purposes should be candidates for plating. Furthermore, each site is a unique situation and should be evaluated individually by archaeologists for their expertise on the cultural aspects, engineers on the structural aspects of the road and soils, and "operations staff" or maintenance staff on the anticipated use and maintenance of the road.

It is important to realize that the main goal of road plating is to prevent damage to portions of the site located outside the road prism. The second goal is to prevent known or suspected buried features and cultural deposits within the road prism from damage from road traffic; in these instances, rerouting or data recovery should be considered as alternatives to plating.

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