United States Department of Agriculture

Forest Service

Southwestern Region

Cultural Resources Specialist Report

Forest Plan Revision
FEIS

Submitted by: __/s/ _____
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Minor edit to table 3 and correction to list of military forts on page 3 completed on 3/6/14 by Michelle Davalos, Forest Planner, with review from Pete Taylor, District Archaeologist

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Introduction

The Apache-Sitgreaves National Forests (ASNFs) is in the process of revising the 1987 Forest Land Management Plan to meet the legal requirements of the National Forest Management Act of 1976 and the provisions of the 1982 planning rule. Specifically for cultural resources, the 1982 planning rule requires as part of the preparation and documentation for a Forest Plan Environmental Impact Statement (EIS):

> *b) In the formulation and analysis of alternatives, interactions among cultural resources and other multiple uses shall be examined. This examination shall consider impacts of the management of cultural resources on other uses and activities and impacts of other uses and activities on cultural resource management.*
>
> *(c) Formulation and evaluation of alternatives shall be coordinated to the extent feasible with the State cultural resource plan and planning activities of the State Historic Preservation Office and State Archaeologist and with other State and Federal agencies.*

This report evaluates and discloses the potential environmental consequences to cultural resources that may result with the adoption of a revised land management plan. In addition, this report documents compliance with Section 106 of the National Historic Preservation Act.

Cultural Resources

Cultural resources represent the tangible and intangible evidence of human behavior and past human occupation. Cultural resources may consist of archaeological sites, historic-age buildings and structures, and traditional use areas and cultural places that are important to a group's traditional beliefs, religion or cultural practices. These types of resources are finite and nonrenewable with few exceptions. The lands of the ASNFs contain a long and diverse cultural record that begins approximately 12,000 years ago. Remnants of past and current human activities and events can be found throughout the ASNFs that reflect continuous use by Native peoples and the exploration, settlement, and management by Euro-American cultures. Based on current inventory surveys it is estimated that over 100,000 cultural resource sites are located on the forests. At present, over 6,900 archaeological sites are recorded (ASNFs inventory and site files). Many of these sites are eligible for listing on the National Register of Historic Places. The Heritage Program of the ASNFs is responsible for the management of cultural resources for the benefit of the public through preservation, pubic use, and research.

Relevant Laws, Regulations, and Policy that Apply

Important laws and their accompanying regulations that affect the forests' management and treatment of cultural resources include the following:

- Organic Act of 1897 (Title 16, United States Code (U.S.C.), section 473-478, 479-482, 551)
- Antiquities Act of 1906 (34 Statute 225, 16 U.S.C. 431-433), Uniform regulations at 43 CFR part 3 implement the act.
- Historic Sites Act of 1935 (16 U.S.C. 461), Uniform regulations at 36 CFR part 65 implement Act.
- National Historic Preservation Act (NHPA) of 1966 as amended, (16 U.S.C. 470) Uniform and departmental regulations at 36 CFR part 800 implement NHPA.
- Archaeological Resources Protection Act of 1979 as amended (ARPA) (16 U.S.C. 470aa *et seq*). Uniform regulations and departmental regulations at 36 CFR part 296 implement ARPA.
- Archeological and Historic Preservation Act of 1974 (16 U.S.C. 469-469c-2)
- American Indian Religious Freedom Act of 1978 (AIRFA)
- Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) (25 U.S.C. 3001) Uniform regulations and departmental regulations at 43 CFR part 10 implement NAGPRA.
- National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321-4346). The act is implemented by the Council on Environmental Quality (CEQ) regulations at 40 CFR 1500-1508.
- National Forest Management Act of 1976 (NFMA) (16 U.S.C 1600)
- Federal Land Policy and Management Act of 1976 (FLPMA), (43 U.S.C. 1701)
- Executive Order 11593, Protection and Enhancement of the Cultural Environment (13 May 1971)
- Executive Order 13007, Indian Sacred Sites (24 May 1996),
- Executive Order 13175, Consultation and Coordination with Indian Tribal Governments (6 November 2000)
- Executive Order 13287, Preserve America (3, March 2003)
- Executive Order 13327, Federal Real Property Asset Management (4, February 2004)
- Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716)
- 36 CFR 60 National Register of Historic Places
- 36 CFR 61 Procedures for Approved State and Local Government Historic Preservation Programs
- 36 CFR 63 Determinations of Eligibility for Inclusion in the National Register of Historic Places
- 36 CFR 65 National Historic Landmarks Program
- 36 CFR 68 The Secretary of the Interior's Standards for Historic Properties
- 36 CFR 79 Curation of Federally Owned and Administered Archaeological Collections

The Forest Service Manual 2360 Heritage Program Management provides the basis for specific Forest Service Heritage Resource management practices. Additional direction, standards and guidelines are found in the Southwestern Region Manual Supplement FSM 2361-99-3 Special Interest Areas. The Southwestern Region FSH 2309.24 Cultural Resource Handbook provides standards and guidelines for inventory surveys, site marking, documentation and damage assessments.

Methodology and Analysis Process

The primary legislation governing cultural resource management is the National Historic Preservation Act (NHPA) of 1966 (amended in 1976, 1980, and 1992). Section 106 of NHPA requires that federal agencies take into consideration the effects of their undertakings on historic properties, which are defined in 36 CFR 800.16(l) as any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP). The "Section 106 review process," entails five steps: 1) determining whether the proposed action is an undertaking that has the potential to affect historic properties); 2) identifying historic properties; 3) evaluating the significance of historic properties; 4) assessing effects; and 5) consulting with interested parties (including Native People), the State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation (ACHP). Section 110 (Federal Agencies' Responsibility to Preserve and Use Historic Properties) of the NHPA provides direction to federal agencies to establish programs and activities to identify and nominate historic properties to the NRHP and to consult with tribes. The Southwestern Region has a programmatic agreement with the ACHP and SHPOs that stipulates the Forest Service's responsibilities for complying with NHPA.

Under the regulations an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative. Specific examples of adverse effects cited in statute include (36 CFR 800.5):

- Physical destruction of or damage to all or part of the property.
- Removal of the property from its historic location.
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance.
- Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features.

The analysis includes a review of the alternatives and an assessment of the potential impacts each alternative could have to cultural resources on the forests. The criteria used

for establishing the area of potential effect for cultural resources was based on the possible acres treated within each potential natural vegetation type (PNVT) and the boundary of each management area. The existing condition was determined by reviewing the National Register of Historic Places, a review of forests' archaeological site and inventory files, cultural resource management overviews, heritage Geographic Information System (GIS) database, and other natural resource and fire history databases. Applicable data that was collected and analyzed for the Travel Management Draft Environment Impact Statement (Schroeder 2010) was used in this analysis (e.g., potential site densities, previous effects to cultural resources, areas previously mechanically treated). Applicable maps generated through GIS analysis were consulted to determine the number of known cultural resources within the potential natural vegetation types and management areas. Each alternative was regarded relative to each other by the amount and type of potential treatments and the potential affect on cultural resources.

The estimated cost for cultural resource compliance for mechanized vegetation treatments in ponderosa pine, grasslands and woodlands was used to provide an evaluation of how cultural resource management could affect multiple uses and activities. Cost estimates were based on the average contract cost per acre for cultural resource inventories.

Assumptions

In the analysis for this resource, the following assumptions have been made:

- The land management plan provides a programmatic framework for future site-specific actions.
- The plan decisions (desired conditions, objectives, standards, guidelines, special areas, suitability, monitoring) will be followed when planning or implementing site-specific projects and activities.
- Analysis and impacts to cultural resources from site-specific actions will be addressed at the time site-specific decisions are made.
- Law, policy, and regulations will be followed when planning or implementing site-specific projects and activities.
- The agency has the capacity (e.g. funding, personnel, other resources) to accomplish the minimum planned objectives.
- There is no cross-country motorized use where prohibited.
- Burning could occur across all NFS lands.
- Unplanned ignitions are analyzed at the time of the start and documented in the Wildland Fire Decision Support System (WFDSS). Management response to a wildfire is based on objectives appropriate to conditions of the fire, fuels, weather, and topography to accomplish specific objectives for the area where the fire is burning. Effects to cultural resources are considered when determining the objectives and management response to a wildfire
- The kinds of resource management activities allowed under the prescriptions are reasonably foreseeable future actions to achieve the goals and objectives of the forest plan. The specific location, design and the extent of such activities are generally not known. The effects analysis is intended to be useful for comparing

and evaluating alternatives on a forest-wide basis. It is not intended to be applied directly to specific locations on the forests.

- Prior to making a project-level decision that is subject to NHPA, the forests would complete cultural resource surveys to locate and evaluate sites for the National Register of Historic Places (NRHP) and analyze the effects of the proposed use or activity in compliance with the *First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities among New Mexico Historic Preservation Officer and Arizona State Historic Preservation Officer and Texas State Historic Preservation Officer and Oklahoma State Historic Preservation Officer, and the Advisory Council on Historic Preservation and United States Department of Agriculture Forest Service Region 3 (R3* programmatic agreement) (Forest Service, 2003). Following the identification and recording of cultural resources, mitigation measures appropriate to the proposed undertaking would be implemented. Such measures would most likely include avoidance of cultural resources by redesigning the project boundaries, modifying construction plans, or excluding site areas from treatments. In cases where specific activities would constitute an adverse effect and avoidance could not be accomplished, the adverse effects would be resolved in accordance with 36 CFR 800

Revision Topics Addressed in this Analysis

Cultural resources may be affected by the issues addressed in the three revision topics: maintenance and improvement of ecosystems, managed recreation, and community-forest interaction. The NHPA act requires that federal agencies consider the effects of their actions on cultural resources. The 1982 planning rule states that the *"examination shall consider impacts of the management of cultural resources on other uses and activities and impacts of other uses and activities on cultural resource management".* For each of the topics the analysis will examine:

How multiple uses and activities proposed in the alternatives potentially affect cultural resources eligible for or listed on the National Register of Historic Places

How will management of cultural resources potentially affect multiple uses and activities proposed in the alternatives?

The Study Area

The forests are located in east-central Arizona and range in elevation from approximately 3,500 feet near Clifton to about 11,500 feet on Mt. Baldy. There are 2,015,352 acres of NFS lands within the current forest boundaries. Vegetation ranges from desert scrub to alpine tundra. An estimated 247,438 acres (~12% of the forests) have a slope gradient of 40% or greater. The forests cover portions of Coconino, Navajo, Apache, and Greenlee

counties. The Forests are administratively divided into five Ranger Districts: Alpine, Black Mesa, Clifton, Lakeside, and Springerville.

Summary of Alternatives

A summary of alternatives, including the key differences among alternatives, is outlined in the Draft Environmental Impact Statement.

Description of Affected Environment (Existing Condition)

Cultural Setting

Cultural resources on the forests indicate a long and enduring human presence beginning in the Late Paleoindian period and continuing into the present. Specific Paleoindian sites have not been recorded, but diagnostic projectile point types such as Folsom and Clovis have been documented as isolated surface artifacts on the forests (ASNFs inventory and site files). The Archaic period sites on the forests are represented by dispersed artifact scatters, bedrock mortars, rock-filled roasting pits, rock shelters, and a variety of dart point types such as Pinto, Jay, Elko, and Gypsum. In general, sites dating to this period are located in all vegetation zones. Basketmaker II-III period sites are sparser on the forests. Most of the sites with pithouses are found within the piñon- juniper woodland. Pueblo I period sites include pithouse villages, above ground habitation structures, and artifact scatters. These sites are generally located within the piñon-juniper woodland and within the pine-oak forest.

Table 1. Temporal Periods and Cultural Phases

Temporal Periods/Cultural Phases			Calendar years*
	Anasazi (Pecos)	Highland Mogollon (Haury)	
Paleoindian			9500– 6500 B.C.E
Archaic			6500–400 B.C.E
Early Agriculture	Basketmaker II- III	Hilltop Cottonwood Forestdale	400 B.C.E – 800 C.E.
Formative	Pueblo I	Corduroy Dry Valley	800–1000 C.E.
	Pueblo II	Carrizo Linden	1000-1150 C.E.
	Pueblo III	Pinedale Canyon Creek	1150-1300 C.E.
Proto-historic	Pueblo IV		1300-1540 C.E.
Historic	Pueblo V		1540 C.E.-Present
			1600 C.E.-Present

[1]

* BCE (Before Common Era) and CE (Common Era) is equilant to BC, (Before Christ) and AD (*Anno Domini*,) of the Georgian

Habitation of the forests dramatically increases during the Pueblo II - early Pueblo III period. Approximately 70 percent of all documented sites on the forests date to this period and are associated with the archaeological cultures identified as the Mogollon and Anasazi. Some of these sites consist of multiple roomblocks of between 30 and 40 rooms with associated features and artifacts. Several of these large sites include great kivas. The most numerous sites that date to this period are typically one-two room masonry structures, small roomblocks of between 4 to 6 rooms, water control features, and artifact scatters without any surface features.

During the Pueblo III period there is a steep decline in the number of sites on the forests but an increase in the number of rooms per site (Donaldson n.d.). Water and soil-control features are widespread and far more common than in previous times, particularly along the Little Colorado River. Shortly after the beginning of the Pueblo IV period, Bailey Ruin a large 200 to 250 room pueblo appears to have been inhabited no later than A.D. 1325 (Mills et al. 1999:240). Nearby sites, such as Fourmile Ruin, continue to be occupied at least into the mid-1300s. By the mid 1400's the forests were no longer used for permanent habitation but continued to be used on a temporary basis by the Zuni, Hopi and Acoma, descendants of the Mogollon and Anasazi.

Evidence of various Apache tribes using the area suggests that they arrived in the 1600's. Archaeologists disagree on exactly when they arrived and by what route (Perry 1991:145–152; Towner 1999:4–9; Wilcox 1981), few place the Apache in Arizona before the Historic period (Gunnerson 1956; Schroeder 1952: Figure 3.2). However, the Apache themselves believe that they have always been in what is now Arizona. Apache use generally appears to have been seasonal and evidence of their presence includes artifact assemblages, temporary brush structures, and limited activity areas for processing and collecting resources. Areas along Show Low and Eagle Creeks show evidence for relatively long-term intensive use (Donaldson:n.d.). Other known sites occur in the pine-oak forests.

The Coronado Expedition passed through the area in the 1540's. Although no specific sites related to the expedition have been found on the forests, the expedition is believed to have traveled in the vicinity of highway 180. Historic Euro-American use begins in the 1860's and continues to the present. Spanish –Americans established agricultural communities in Round Valley in 1862 and St. Johns by 1872. Military forts were founded in the area, most notably Camp Mogollon (aka Camp Ord and Fort Apache) in 1870 (Plog 1981b). General George Crook established a supply and transportation route along the Mogollon Rim between Camp Verde and Camp Mogollon (later Fort Apache) (Jacobs 1980). This transportation and supply route became known as Crook's Road and was used into the early 1900s and is now a designated National Recreation Trail. In the fall of 1871, reservations were established at Fort Apache for the Cibecue and White Mountain Apache living in the White Mountain area, Camp Grant for the San Carlos Apache and

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Calendar.[1]

those White Mountain Apache living south of the White Mountains, and Camp Verde for the Yavapai and Tonto Apache (Corbusier 1969:60–61; Schroeder 1959).

More Euro-American settlers came to the area after the establishment of the reservations. These settlers developed an extensive irrigation ditch system for farming in the surrounding valley (Plog 1981b). Some of these irrigation ditches are located on the forests and are still in use today. Sheep and cattle herders set up homesteads within the area. At around the same time, Mormon settlers from Utah led by Jacob Hamblin moved to the area in 1877. Mormons established logging camps at Pinedale and Taylor and farming communities were established at Clay Springs and Pinedale (Plog 1981b).

The Atlantic and Pacific Railroad reached Holbrook in 1880 and resulted in an economic boom for the region (Lightfoot 1978). After the arrival of the railroad, sheep and cattle grazing became widespread throughout the Mogollon Plateau. Lightfoot (1978) notes that populations near the settlements of Pinedale, Heber, and Taylor continued to grow until 1900, along with increased tensions between the cowboy and Mormon factions. Remains of homesteads, cabins, and improvements for ranching and farming dating to this period are found across the forests, primarily near communities.

The Black Mesa Forest Reserve was established in 1898, of which, a part became the Apache National Forest in 1908. The Sitgreaves National Forest was established in 1908. By 1917 the commercial logging industry was established on the forests. During the 1920's an extensive network of logging railroads were constructed on the forests, primarily on the Sitgreaves side. By the time the depression was over, logging trucks had replaced railroads as the primary means of transporting timber. Most logging railroads in the forests were not used after 1939 and were dismantled in 1944 (Lightfoot 1978). The remains of logging railroad features with associated camps dating from the 1920s to 1940s are found throughout the forests.

Other historic transportation routes are found within the forests. A 1912 map of Arizona shows several wagon routes passing through the forests between the towns and cities (Keane and Bruder 2003). By the 1920s, most of the roads through the forests still had not been graded or paved, but by the 1930s several roads had been graveled and U.S. 60, State Route (SR) 77, and portions of SR 260 had been constructed (Keane and Bruder 2003). During the 1930's the Civilian Conservation Corp (CCC) made improvements along the Blue Road and constructed other roads within the forests. Some of these roads are linear historic properties that may be eligible for the NRHP.

During the Civil Conservation Corp era, several CCC camps were established on the forests. Employees of the CCC performed innumerable outdoor conservation projects between the years 1933 and 1942 under the guidance of other federal agencies (Collins 1999:201). Included in these projects were the construction of campsites and shelters, installation of telephone lines, boundary fencing, trail, road, and bridge building, the construction of numerous other buildings, and various forestry endeavors across the forests (Moore 2006:110, 126, 130–132). The CCC also erected seven fire lookout towers. Two administrative sites were built for district rangers at Water Canyon and Pinedale, both are still used today. Remnants of all these activities and events can be found throughout the forests.

Inventory (Identification), Evaluation and the National Register

One of the steps to comply with Section 106 of the NHPA is identifying historic properties and evaluating the significance of those historic properties for the NRHP. In addition to Section 106 compliance requirements, federal land agencies are directed to inventory cultural resources and nominate eligible properties to NRHP per E.O. 11593 *Protection and Enhancement of the Cultural Environment*, Section 110 of the NHPA, and ARPA Section 14. Section 110 establishes inventory, nomination, protection and preservation responsibilities for federally owned historic properties. ARPA section 14 directs agencies to develop a schedule for inventory surveys of lands likely to contain the most scientifically valuable archaeological resources. To meet the Forest Service's responsibilities under E.O. 11593, Section 110 of the NHPA and ARPA the Heritage program conducts and/or facilitates non-project specific inventory surveys for cultural resources within the ASNFs and nominates federally owned properties that meet the criteria to the National Register of Historic Places. Most of the inventories and evaluation of cultural resources were conducted to meet Section 106 compliance requirements.

Important inventories and discoveries in the late nineteenth to early twentieth century on the forests include locations described in Frank Cushing's work with the Zuni between 1872-1884, explorations by Bandelier 1892, surveys by Walter Hough 1903; and Spier 1919a, 1919b. Other important research projects were conducted on and adjacent to the forests in the 1930s-1960's (see Haury 1940 and 1950, Martin, et al 1964, Danson 1957) but it was not until 1971 that a larger-scale systematic research project in and near the forests was conducted (Plog et al 1976). The Chevelon Archaeological Research Project (CARP) surveyed a large area to the south of Chevelon Creek. Other large surveys projects were conducted for the Little Colorado Planning Unit and the Mollogon Rim Planning Unit that produced enough data to allow for development of a typological system of sites and to provide management recommendations for site types found on the forests (Lerner 1979; Plog 1981a, 1981b).

Since the conclusion of the CARP project, other research survey projects on the forests have been completed (Ciolek-Torello 1981; Lightfoot 1978). Both Lightfoot (1978) and Ciolek-Torello (1981) focused their studies on the relationship between environmental factors and site location near Pinedale. According to Lightfoot (1978), the majority of sites can be found in the piñon-juniper community below 6,800 feet. The University of Arizona conducted a field school starting in 1993 in the Silver Creek drainage for the Silver Creek Archaeological Research Project (Herr 2001; Mills et al. 1999b). The project excavated several great kiva sites and habitation sites. The CARP and Silver Creek drainage projects resulted in numerous graduate theses that contribute to our understanding of human use and occupation of the forests.

In addition to the academic research approximately 2,720 cultural resource surveys have been conducted for land management activities, primarily for timber and fuel wood sales, hazard fuels reduction projects, and several large data recovery projects for land exchanges, highways, and infrastructure and energy corridors (ASNFs inventory records). As of 2010, approximately 1,091,498 acres of the forests have been sampled surveyed, of

which 376,863 acres have been intensively surveyed for cultural resources (ASNFs heritage GIS data base).

Site Types

Archaeological sites on the forests range in size and function. Plog (1981a, 1981b) lists 13 types of prehistoric sites; while he does not list specific types of historic sites, he gives lists of traits and features found at sites associated with certain activities. Prehistoric site types include the following in Table 2 (summarized from Plog 1981a, 1981b,1981c). Plog (1981a) also discusses potential types of historic-age sites in the forests (see Table 3).

Table 2: Archaeological Prehistoric Site Types

Type	Description
Low-Density Artifact Scatters	Low-density artifact scatters consist of few artifacts spread over a large area (1 artifact per 10 m^2). These scatters often do not meet the accepted definition for sites and usually lack the potential to provide significant information.
Lithic Scatters	Lithic scatters are artifact scatters containing only flaked and/or ground stone artifacts.
Ceramic Scatters (a.k.a sherd scatters)	Ceramic scatters contain only ceramic sherds and are the results of activities that require the use of ceramic vessels such as carrying water or storage.
Artifact Scatters	Artifact scatters contain both lithic and ceramic artifacts. These scatters can be the result of activities that require both lithic and ceramic artifacts at resource procurement sites, habitation sites with either ephemeral or buried structures, or by the reuse of sites by individuals with different artifact types at their disposal.
Petroglyphs and Pictographs	Petroglyphs and pictographs are created images found on rock faces, often on rock outcroppings or in rock shelters. Petroglyphs are images pecked, incised, or carved into the rock's surface, while pictographs are painted images.
Water Control Devices	Water control devices such as check dams, grids, and terraces are designed to control the flow of water and/or facilitate the retention of soil moisture for agriculture. These features may or may not be associated with permanent or semi-permanent habitation sites or fields.
Shrines	Shrines are usually small circular or rectangular structures, often occurring at high elevation. Artifacts, such as beads or ceramics, are sometimes associated with these features.
Rock Shelters	Rock shelters are natural occurring cavities or overhangs in rock formations that were used by people primarily for habitation. Many rock shelters were used by groups or individuals of several cultural periods and have multiple, successive layers of occupation. Rock shelter sites are a primary source of perishable artifacts such as basketry and textiles that are normally absent from open air sites.
Pithouse Sites	Pithouse sites are habitation sites that predominantly date prior to A.D. 1000 and may consist of a single pithouse structure or multiple pithouses organized as a village. Pithouse range in size, depth, and construction, but they are all structures dug into the ground with a superstructure of wood branches and/or beams and dirt or adobe walls.
Pueblo Sites	Pueblo sites are habitation sites constructed of aboveground masonry that dominate the settlement system after A.D. 1000. Three different types of sites are categorized under the label "pueblo sites": field houses that are commonly evidenced as a boulder pile over a small area; U-shaped structures with one or two rooms; and pueblos (roomblocks) with four walls consisting of two or more rooms.
Great Kivas	Great kivas are large circular ceremonial structures commonly evidenced on the surface as a circular depression. Great kiva sites may contain this feature type singly or can be associated with a larger pueblo site.
Compounds	Compounds are walled enclosures measuring up to 100 m^2. The function of these sites is unclear, but they often have a very different artifact assemblage from neighboring sites
Defensive Sites	Defensive sites are characterized by defensive walls and locations with restricted access such as a hilltop.

Table 3. Historic-age Activities and Possible Site Types.

Historic Period Activity or Context	Site Types		
Protohistoric (Yavapai, Apache) occupation	Temporary camps Fields	Ramadas/shades Sweat lodges	Storage pits Processing pits
Military	Forts Camps	Trails Battlefields	Blazed trees Roads
Settlements	Houses Outhouses Barns	Graveyards Corrals Public buildings	Trading posts
Farming	Homesteads Fields	Irrigation Fence lines	
Sheepherding	Sheep crossings Temporary camps	Sheep dipping vats Sweat houses	Water troughs
Ranching	Ranch houses Barns Corrals	Outhouses Temporary camps Line Shacks	Fence lines
Lumbering (a.k.a. Timber harvesting/ Logging)	Camps Landings	Railroad beds Sawmills	
Forest Service and CCC	Cabins Fire towers	Roads Ranger stations	Camps

[1] Plog, 1981a

Site Distribution

The majority of sites in the forests are found between 6,000 and 7,000 feet in elevation. Very few sites are found below 6,000 feet and above 8,000 feet. Corresponding to the 6,000- to 8,000-foot elevations, sites predominantly fall into either the woodlands (38%) or the ponderosa pine forests (35%). The location of sites confirms what previous researchers have concluded (see Figure 1). Donaldson (n.d.) found that within natural drainage basins there is a strong correlation of prehistoric site frequency and elevation. A majority of sites in the middle Little Colorado drainage basin fall between 6100 to 7200 feet. The majority of sites within the upper Little Colorado drainage basin are located between 7100 to 8400 feet, and the majority of sites within the Salt-Gila drainage basin

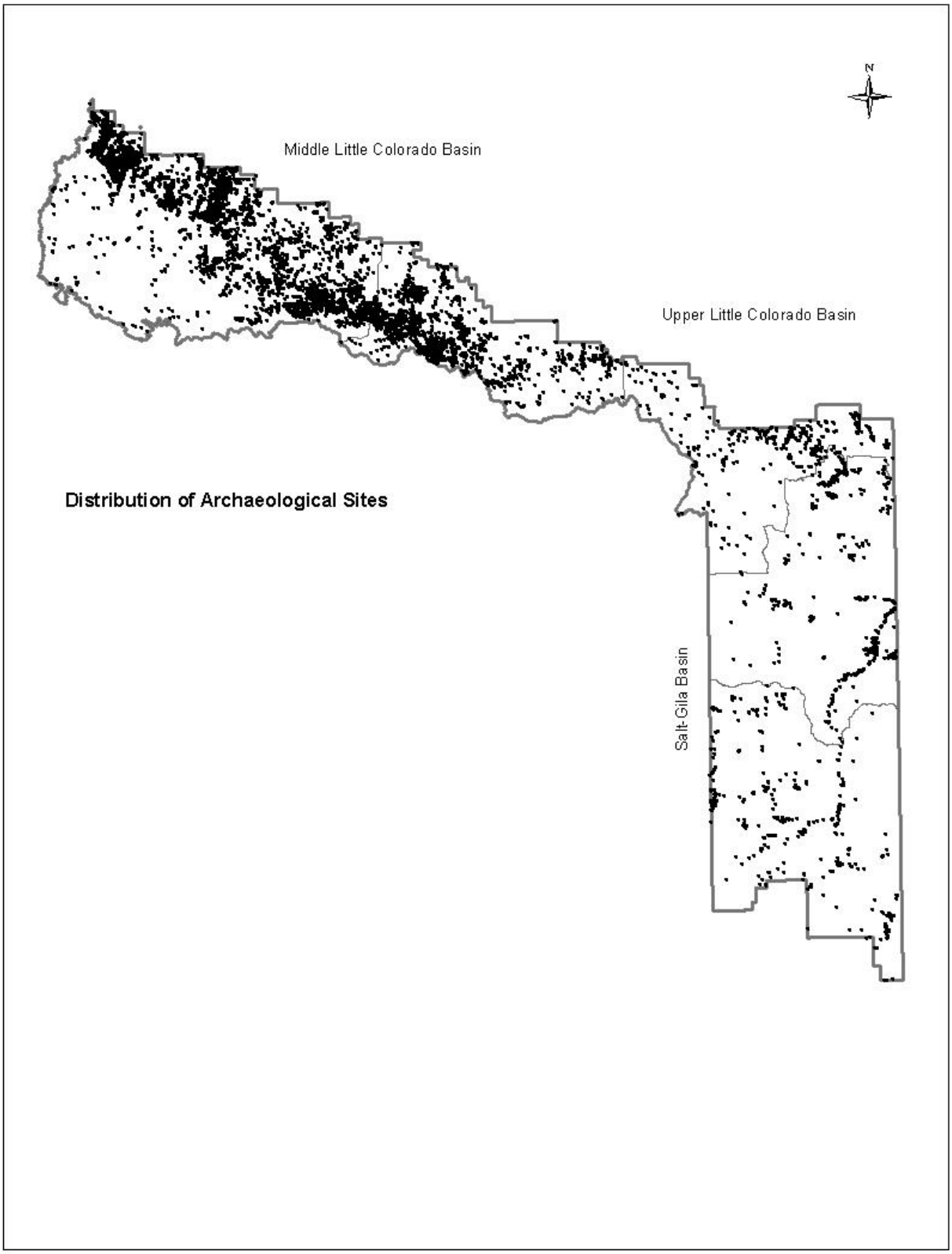

Figure 1 Distribution of archaeological sites on the forests in 2009 (adapted from Donaldson, n.d.).

are found below 7200 feet. Loria (1975a, 1975b) analyzed settlement patterns in the Show low and Pinedale area. Her analysis revealed that sites are most likely to be found in areas characterized by ponderosa pine or a transition area of ponderosa pine, juniper, and piñon at an elevation of 6600 to 6800 feet; with 15 to 18 inches of precipitation and gravel loam soils.

The Rodeo-Chediski Fire survey conducted in 2003 found that most prehistoric sites on the Black Mesa Ranger District and Lakeside Ranger District were found below 6,800 feet and that 58 percent were found in ponderosa pine forest (North 2003:55); however, site type was a determining factor in site location. More artifact scatters were located on the ponderosa pine forests, more pithouse sites were located in the piñon-juniper woodlands, and more pueblo sites were located in the mixed ponderosa pine and piñon-juniper forests (North 2003:58). The 2003 study also confirmed that prehistoric sites are found most often on ridges or hills and least often on floodplains, as opposed to historic sites which are most often found on floodplains (North 2003:57). Pueblos and pithouse sites were located primarily on ridges or hills, while artifact scatters were found both on ridges/hills and on floodplains. Barnes (2004) study documented that 86% the known sites on the Sitgreaves National Forest are found in ponderosa pine and piñon-juniper vegetation types (33.6% in ponderosa and 53.1% in piñon-juniper)

Recent analysis of site location data in relation to terrestrial ecosystem system units (TEU) has also revealed patterns that can be used to predict where sites are most likely to be located in order to understand potential impacts to cultural resources. Based on heritage GIS data, fifteen TES units have areas with a higher site density (>=1 site per 20 acres).

Table 4. Terrestrial Ecosystem System Units (TEU) with a known average of 1 site or more per 20 acres.

MAP UNIT	Dominate Vegetation Type
41	One seeded juniper & New Mexico Needle grass
51	Piñon pine &One seeded juniper
55	Piñon pine & One seeded juniper
60	Arizona Sycamore& Velvet ash
61	Piñon Pine,Alligator Juniper, one seeded juniper, Gambel Qak
102	Arizona Sycamore / Velvet Ash
130	Piñon pine, Alligator juniper, One-seed Juniper, Gray oak
186	Ponderosa pine, Piñon pine, Alligator juniper, Gambel oak
198	Narrowleaf cottonwood
479	One seeded juniper, Western Honey mesquite, Curly mesquite
501	Piñon pine, One-seed Juniper, Quinine bush
506	Piñon pine, One-seed Juniper, Quinine bush
516	Piñon pine, Alligator juniper, One-seed Juniper
518	Piñon pine, Alligator juniper, One-seed Juniper

Areas Requiring More Intensive Survey

Most of the lands on the ASNFs have not been surveyed for cultural resources. As of 2011, approximately 1,091,498 acres of the forests have been sampled surveyed, of which 385,309 acres (current federal lands) have been intensively surveyed for cultural resources resulting in the identification of over 6,973 sites (ASNFs heritage GIS data base, INFRA database). At present, approximately 6,658 sites are under forest management. Of the largest vegetation types that comprise the forests, approximately 31 percent of the woodlands (28 percent piñon-juniper and 3 percent Madrean pine-oak), 32 percent of the ponderosa pine, 24 percent of the great basin grasslands and 17 percent of the mixed conifer have been intensively surveyed. The least amount of survey has been conducted within the interior chaparral and spruce-fir forest types. Priorities for comprehensive archaeological surveys include the woodland vegetation types, Chevelon Canyon area, and the Blue Range Primitive area, San Francisco River, and Eagle Creek corridors.

Table 5. Displays the number of acres surveyed and recorded sites by vegetation type as of 2011[2].

Vegetation Type (PNVT)	NFS Acres	Surveyed Acres of PNVT	Percent of PNVT Intensively surveyed	Identified Sites in PNVT	Number of Surveyed Acres per 1 Site*
Cottonwood-Willow Riparian Forest	15,876	3,272	20%	207	96
Dry Mixed Conifer Forest	147,885	24,538	17%	103	430
Great Basin Grassland	185,523	44,769	24%	1,147	60
Interior Chaparral	55,981	1,165	2%	24	83
Madrean Pine-Oak Woodland	394,927	13,631	3%	347	76
Mixed Broadleaf Deciduous Riparian Forest	9,657	607	6%	74	38
Montane Willow Riparian Forest	4,808	1,494	31%	37	55
Montane/Subalpine Grasslands	51,559	7,482	15%	252	241
Piñon-Juniper Woodland	222,166	61,246	28%	2,571	31
Ponderosa Pine Forest	602,206	194,767	32%	2,594	85
Semi-desert Grassland	106,952	5,132	5%	120	98
Spruce-Fir Forest	17,667	278	2%	5	Unknown
Wet Mixed Conifer Forest	177,995	23,981	13%	66	959
Wetland/Cienega Riparian Areas	17,900	2,947	16%	55	Unknown
Totals*:	2,011,102	385,309	19%	7,602	

* Note: Total number of recorded archaeological sites in table does not match total number referenced in text. If sites are located near the boundary of a PNVT, their spatial area may overlay multiple PNVTs resulting in double counting the site when selecting sites in the GIS heritage data layer by PNVT. The data provides relative counts to see differences between PNVTs. The total number of acres surveyed only includes GIS heritage survey data for complete/intensive surveys for lands in current federal ownership. Linear, point, and sample survey areas in the GIS heritage survey layer include acres that are completely surveyed but the data was excluded from this analysis because specific spatial data is missing. Total number of sites in PNVT includes sites that were not within complete survey areas. *Total number of surveyed acres per site is based on sites located within complete survey areas.

National Register Status of Cultural Resources

The National Register of Historic Places is the official list of historic properties recognized by the Federal government as especially worthy of preservation for their national, state, or local significance. At present, over 6,973 archaeological sites are recorded (ASNFs inventory and site files). Of those, a minimum of 1,201 sites have been determined eligible for the NRHP. Approximately 170 sites have been determined not eligible for the NRHP. The eligibility status of the remaining sites is unevaluated. According to the R3 programmatic agreement and Forest Service policy all sites that are unevaluated are treated as eligible until they are formally determined eligible or not eligible for the NRHP. At present, 10 properties are listed on the NRHP.

- PS Knoll Lookout
- Bear Mountain Lookout
- Lake Mountain Lookout
- Los Burros Ranger Station
- Deer Springs Lookout
- Promontory Butte Lookout
- Pinedale Ranger Station
- Water Canyon Administrative Site
- Butterfly Lodge (under private ownership)
- Bailey Ruin

Recommended Properties for Nomination to the National Register

During the planning period the following sites are recommended as a priority for nomination to the NRHP:

- Rudd Creek Rock Art Multiple Property Listing
- Roundy Crossing
- Black Canyon Rock Shelter
- Silver Creek Archaeological District (Pottery Hill, Cline Point, Hough's Great Kiva, Cothrun's Great Kiva)
- Prison Point Great Kiva site
- Foote Creek Canyon Complex
- Blue River Drainage Multiple Property Listing
- Eagle Creek Drainage Multiple Property Listing
- Double Circle Ranch District
- Historic XXX Ranch
- General Crook Trail/Road
- Logging railroads of the Apache-Sitgreaves NFs
- High elevation ceremonial sites

Traditional Cultural Properties (TCPs)

Traditional Cultural Properties (TCPs) are defined in National Register Bulletin 38 as properties associated "with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community". TCPs can range from structures, mountains and other landforms to plant gathering locations to communities. These areas are considered historic properties that may be eligible to the National Register of Historic Places. With regard to the forests, TCPs are most often associated with American Indian cultures.

Five American Indian tribes represented by nine tribal governments are known to have ancestral ties and/or traditional use areas on the Apache-Sitgreaves NFs based on current and past consultation: Fort McDowell Yavapai Nation, Hopi Tribe, Navajo Nation, Pueblo of Zuni, San Carlos Apache Tribe, Tonto Apache Tribe, White Mountain Apache Tribe, Yavapai-Apache Tribe, Yavapai-Prescott Indian Tribe, and the Ramah Chapter House of the Navajo Nation. Forest Service consultations with appropriate members of each tribe can identify the tribe's historic and present day uses of the forests.

The lands, resources, and the archaeological sites within the forests are considered traditionally significant to all affiliated tribes and in some cases certain resources or areas are considered sacred to a specific tribe/s. Each group has their own history, traditions, and relationship to the land and to the other groups. Traditional use of the forests and its resources by the tribes dates back several generations, and for some groups many centuries.

Known traditional use areas and cultural places located within the forests include but are not limited to spruce forests, mountains, cinder cones, springs, caves, trails and shrines. Among the better known TCPs and sacred sites known to have been used and/or continue to be used for traditional cultural purposes that have been identified in either ethnographic reports, archaeological reports, professional papers, and through project level tribal consultations are listed in Table 6. In some cases there are multiple areas used for collection of resources or religious ceremonies on or within the vicinity of the topographic feature. Many other areas located on the forests are used for traditional cultural purposes but have not been specifically identified. Additional areas may be identified through project or permit specific tribal consultation. Therefore, the inventory of known TCPs and areas used for traditional cultural purposes is subject to change; the list provided in Table 6 is not comprehensive.

Many of the shrine locations have been adversely impacted by management actions or vandalism (looting) that occurred prior to passing the Antiquities Act of 1906 and the National Historic Preservation Act of 1966. For example, Greens Peak shrine was destroyed by the construction of a fire lookout tower. Rose Peak shrine was severely impacted by the lookout complex. Harris Cave and Bear Cave were looted at the turn of the century. Bead Spring shrine was looted by vandals and damaged by forest management activities. Escudilla Mountain has been impacted by construction of a road and a fire lookout tower. Big Springs has been damaged from recreation and water development. Coon Spring was capped and developed for a city water source. No

additional impacts to TCPs from ground disturbance have occurred within the Mount Baldy, Escudilla Mountain and Bear Wallow wilderness areas since these areas were designated.

Many of the shrines have been disturbed or severely damaged which has reduced their potential to yield significant scientific data. Although aspects of their physical integrity have been altered or no longer exist, these locations may still be eligible for the NRHP and have been identified by the Tribes as still important in maintaining the traditions and beliefs of their community.

Table 6. Traditional Cultural Properties on the Apache-Sitgreaves National Forests.

Place name/Location	**Place Name/Location**
Escudilla Mountain*	Coon Spring
Mount Baldy	Quarter Spring
Greens Peak*	Buckshot Spring
Rose Peak*	Little Valley Spring
Red Mountain	Carnero Spring
Gobbler Peak*	West Fork Spring
St. Peters Dome	Point of Mt Spring
Burro Mountain	Escudilla Spring
Antelope Mountain	Bead Springs
Pole Knoll	Big Springs
Flume Mountain	Point of Mt Spring
SU Knoll	Eagle Cave
Chevelon Butte*	Harris Cave
Head of Chevelon Canyon	Caves along San Francisco River
Areas near Aspen Lake	Caves along the Blue River
Little Colorado River	Bear Cave

* Currently used and managed as a communication site and/or a location of a fire lookout tower.

Public Outreach, Interpretation and Education

One of the objectives of the heritage program is to promote and invest in public education and outreach to meet the intent NHPA Section 110, Executive Order 13287 Preserve America, and ARPA section 10(c). ARPA states "Each federal land manager shall establish a program to increase public awareness of the significance of the archaeological resources located on public lands and Indian lands and the need to protect those lands". The forests' heritage program has been active in providing opportunities to the public to promote cultural resource stewardship and conservation through volunteer programs, recreation opportunities, and presentations. Examples of public outreach and education that have been conducted in the past or are available on the forests include the following:

- School and public presentations (e.g. K-12 class presentations, AZ archaeological month events, kids in the woods demonstrations and activities)
- Arizona Site Stewards (Volunteers)
- Black Canyon Journey through Time Auto Tour, Black Mesa Ranger District
- Jacque Ranch Interpretive Site, Lakeside Ranger District
- Los Burros Ranger Station Interpretive site
- Alpine Ranger District Blue River Crossing Rock Art Interpretive Site
- General Crook Recreation Trail, Black Mesa and Lakeside Ranger Districts-
- Numerous Passports in Time Projects (PIT) that involved surveys, site recording and excavations. Some of the projects include the Black Canyon Rock Shelter excavations, Roundy Crossing site excavations.

Current Condition of Archaeological Sites

Past practices, including Forest Service management activities, public resource procurement, recreation use and natural processes have impacted cultural resources. Multiple uses and activities on the forests that have resulted in the most impacts to cultural resources include: infrastructure, livestock grazing, fire, timber and vegetation management, recreation activities, looting and vandalism, and land adjustments (see table 7 below). To assess the existing condition of known cultural resources, site records for 1908 sites were reviewed and a query of the heritage INFRA database for documented disturbances to sites (excluding erosion) was completed.

Table 7. Activity effects and the number of sites impacted by activity.

Type of Activity	Direct and Indirect Effects	Number of Sites Impacted[3]
Infrastructure (mostly roads constructed for timber harvesting)	Displacement, alteration, damage, and destruction of features and artifacts. Compaction. Erosion.	785 (of which 626 sites impacted from NFS roads)
Livestock Grazing	Disturbance by cattle or sheep. Trampling, crushing, compaction. Alteration, damage, and destruction to features. Erosion.	123 (of which 8 sites damaged from tank and pipeline construction)
Fire and Fire-Suppression Activities	Alteration, damage, and destruction to features and artifacts.Re-firing, melting, spalling. Erosion.	696
Timber Harvesting (e.g.saw timber, pulpwood, fuelwood)	Displacement, alteration, damage, and destruction to features and artifacts. Removal of artifacts. Erosion.	263
Piñon-Juniper Treatments (pushing and chaining)	Displacement, alteration, damage, and destruction to features and artifacts. Exposure of features and artifacts. Erosion.	75
Recreation Activities	Unintentional vandalism (e.g., clearing features and artifacts from area for camping, reuse of features and masonry for camping activities).	44
Looting and Vandalism	Displacement, alteration, and damage of features and artifacts. Destruction of features and artifacts. Removal of artifacts.	225
Lands	Transfer to non-Federal ownership. Removal of artifacts, systematic excavation of cultural materials and features.	56

Infrastructure

During the 20th century a large network of roads were created to access, harvest and transport timber. Road construction, use, and maintenance have been a major source of human impacts to sites. Roads have partially damaged or completely destroyed site features and cultural materials by the excavation or grading away of soils, changing the pattern of erosion causing increased flows of water across sites, compaction of soils, rutting from vehicle use during wet conditions. Based on heritage GIS data and existing site records, 626 sites have been impacted by road construction and over 100 sites have been directly and/or indirectly impacted by non forest system roads (temporary logging

[3] The actual number of impacted sites caused from timber harvesting, piñon-juniper treatments and looting is higher. The total number of sites impacted in the table only represents a review of 1908 records and the available site condition data for records in INFRA.

roads, unclassified roads, or unauthorized roads). While the construction and use of roads (both official and unauthorized) in and near sites have obviously directly impacted sites, the presence of roads in and near sites also can indirectly affect site condition as well. The most important of these indirect impacts is intentional vandalism (see Looting and Vandalism).

Construction and management of facilities and structures has adversely impacted cultural resources. Facilities that had the most impact on cultural resources include power transmission and distribution lines, fire lookout towers, communication towers, dams, waste water treatment plants and pipelines, and highways. The impact caused from constructing and maintaining facilities on areas with sites usually involves the destruction of cultural material and features. Most of the impacts caused from construction, maintenance and management of facilities after 1966 were resolved through data recovery. In other cases lack of knowledge about traditional use of TCPs resulted in adverse impacts on TCPs. Several historic fire lookout towers listed on the NRHP have damaged and/or destroyed the physical integrity of shrines (TCPs) prior to 1966. Several communication sites constructed in the 1980's adversely impacted the physical integrity of shrines. Power lines have impacted directly or indirectly 144 sites. Approximately 12 sites have been destroyed by highways. Historic buildings have been removed from their original locations (e.g. Trail Cabin in 1960's).

Livestock grazing

Grazing activity has occurred on the forests since the 1880's. Ranchers built homesteads and range improvements such as fences and water catchments. The lands selected for homesteads and construction of water catchments were often located in the same areas utilized prehistorically. Direct and indirect impacts from livestock have occurred to sites on the forests. Forest permits dating to the early 1900's reveal that large numbers of sheep, cattle and horses grazed and crossed NFS lands. Livestock grazing can negatively impact sites directly by trampling, artifact breakage, soil compaction, soil removal, toppling masonry walls and other types of damage to features as livestock walk through a site. Grazing can indirectly impact sites through loss of ground cover which in turn leads to erosion. Archaeological sites located on the Black Mesa Ranger District within the Heber Wild Horse Territory are exposed to impacts from wild horses. The wild horse herd causes the same type of direct impacts to archaeological sites as livestock grazing, such as trampling, soil removal, trailing. Grazing management practices over the past 20 years have reduced the potential for these types of impacts to cultural resources to occur.

Fire

Most of the lands within the forests are located in a fire-adapted ecosystem. Evidence that prehistoric sites and TCPs have been repeatedly burned (prior to active fire suppression), is demonstrated by fire scarred trees and thermally (fire) altered masonry structures and artifacts. Records indicate that 780,862 acres or 39% of the NFS lands have burned (1956-2009). Generally, low intensity fires have not adversely impacted prehistoric sites that are not fire sensitive or composed of combustible material. Conversely, most historic

sites are either combustible or include combustible cultural material. These sites are very vulnerable to adverse impacts from fire.

The aggressive fire suppression management practices prior to 1970 and livestock grazing resulted in changes to the forest structure. Over time dead and down materials increasingly grew thicker on forest floors and the forests became dense with stands of regenerated young trees. These unnatural conditions have created more frequent high intensity wildfires with permanent adverse impacts to archaeological sites (e.g. Rodeo-Chediski Fire). These impacts include but are not limited to, historic sites completely burned down, prehistoric rock structures spalling apart from exposure to very high temperatures, the refiring of ceramic material, melting obsidian artifacts, and the accelerated erosion of site features caused by hydrophobic soils, denuding of the ground surface exposing cultural materials.

In 2002, the Rodeo-Chediski Fire affected 575 sites in some capacity. Many of the impacts were "generally benign". The fire had permanent impacts in high intensity burn areas, consisting of burned artifacts and masonry, and spalling and discoloration of rock outcroppings with rock art. The indirect impact of increased erosion from loss of ground cover was the biggest impact to site condition (North et al 2003). Eighty-seven sites were impacted from suppression activities. In 2011, the Wallow Fire adversely affected cultural resources. Of the historic sites, five sites were completely destroyed, and two partially and damaged. A total of 64 prehistoric sites were affected. OF those at least 16 sites exhibit damage from spalling. Approximately 28 sites have been affected by erosion and creation of large burned out stump holes resulting in loss and/or displacement of cultural material. A large significant petroglyph site is permanently damaged from cracking and spalling caused from the intense heat. Cracking and spalling caused from the fire continues to result in loss of the rock art elements. effects from the fire. Segments of historic trails have been damaged and/or altered from debris flows and surface erosion.

The following are wildfires (>5000 ac) that have occurred on the forests within the last eight years: Durfee Fire (2009) 6,800 ac, Hot Air Fire (2008) 8,300 ac, Chitty Fire (2007) 15,000 ac, Potato Fire (2006) 6,292 ac, Three Forks Fire (2004) 7,905 ac, KP Fire (2004) 16,092 ac, Thomas Fire (2003) 10,644 ac., Steeple Fire (2003) 6,105 ac., Rodeo-Chediski Fire (2002) 173,273 ac, Wallow Fire (2011) 573,000 ac.Some of the acres within the fire boundaries were exposed to high temperatures and a long duration of burning fuel. Some of the sites within these fires were permanently adversely affected by the fire and/or suppression activities. For example, an unrecorded historic cabin was destroyed by the Durfee fire, historic structures were burned and bulldozed in the Three Forks Fire, and many sites were severely burned by the Potato fire.

Timber and Vegetation Management

Logging on the forests can directly impact sites by temporary road construction, landings, movement of heavy equipment across the ground surface, skidding of trees and indirect impacts from over-harvesting, which can lead to erosion. Commercial timber and fuel wood harvesting has occurred across the forests since the late 1870's. During the 1920's

an extensive network of logging railroads were constructed, primarily on the Sitgreaves NF. By 1939 roads had replaced most of the railroads to transport timber. Existing records indicate that impacts from road construction have caused the most damage (ASNFs GIS heritage database, ASNFs site files). Although many roads were constructed prior to 1960, the network of roads dramatically increased over the next two decades to support timber harvesting: 1963-1987.

Besides impacts from logging saw timber, impacts from commercial and non-commercial fuelwood harvests have occurred. Available GIS data for fuelwood treatments show 17,283 acres were harvested prior to 1990. Permit records indicate that a majority of the forests' non-commercial fuelwood permits have allowed for travel off system roads to collect fuelwood. Fuelwood cutting generally involves the movement of vehicles and a trailer through an area. In addition it increases the level of human activity in areas that have been relatively isolated. The potential for impacts to sites caused from fuelwood harvesting are similar to those caused from Off-Highway Vehicle (OHV) impacts and logging. Some of the unauthorized roads have been created from this activity. Sites in the Black Mesa and Lakeside Ranger Districts have been the most impacted by logging and logging-related activities. This is due to three factors: the presence of saw timber, the topography allows for easier access, which led to more harvesting, and the higher density of sites. On the Black Mesa Ranger District, 150 sites have been impacted by logging. On the Lakeside Ranger District, 89 sites have been impacted by logging. On Alpine (12), Clifton (3), and Springerville (9) Ranger Districts combined, 24 sites have been impacted by logging.

Treatment activities to improve forage and restore grasslands by removing piñon and juniper have impacted sites. Prior to 1987 the forests mechanically treated approximately 50,000 acres of piñon-juniper woodland to grasslands. These acres have been disturbed by chaining, dozer pushing and tree crushing. Pushing involves a bulldozer driving over the ground surface and pushing over trees, uprooting the root ball. This results in tearing up the ground surface and leaving a hole from the root ball. Chaining involves the use of a pair of bulldozers and a 300 foot heavy gauge anchor chain. The chain is attached and strung between the bulldozers. The bulldozers run parallel transects across the landscape chaining the vegetation. This results in breaking trees, and pulling the trees and vegetation from the ground. Cultural materials, features and structures have been permanently damaged from these treatments. Based on the site records reviewed and site condition disturbance data, 87 known sites have been adversely impacted by these actions. Many more sites are known to have been adversely impacted by chaining and pushing. Although a vast majority of these sites were adversely impacted during the 1950s to 1960s, impacts are known to have occurred in the early 1980's and as recently as 2008.

On the Black Mesa Ranger District, 72 sites have been impacted by chaining and pushing. On the Lakeside Ranger District, 10 sites have been impacted chaining and pushing. On Alpine, (0) Clifton (3), and Springerville (2) Ranger Districts combined, five sites have been impacted chaining and pushing.

Recreation Activities

According to the 2002 National Use Monitoring Results for the Apache-Sitgreaves National Forests (Kocis et al. 2002), 1.98 million individuals visited the forests and visited an average of 1.2 recreation sites. A sample of 1,630 people interviewed about their visits to the forests revealed that 36 percent camped in developed campgrounds, 19 percent camped in non-developed areas, 62 percent went hiking or walking, 53 percent drove for pleasure on roads, and 11 percent participated in off-highway vehicle (OHV) use. Eleven percent visited archaeological sites.

In the Southwest, areas popular with campers are often near water, scenic vistas, or flat areas that were also commonly used prehistorically. Camping has impacted sites and can lead to looting and unintentional vandalism of sites. Sites that are near camping areas can be damaged by campers exploiting rock materials from structures and features for fire pits and for other camping activities, digging holes for latrines or trenches for discharging gray water; illegal collection surface artifacts and rearrangement of artifacts into piles, using pieces of collapsed wooden historic structures as firewood, and clearing of space for tents and other equipment. Indirect impacts from camping include damage from erosion resulting from changes in soil compaction and denuding of vegetation.

Non motorized trails, once established, generally do not themselves pose a large threat to sites; but like roads, easy access to sites facilities vandalism, digging of holes within the site to dispose of waste, illegal collection of surface artifacts and looting. Established motorized and non-motorized trails through or near sites have caused direct and indirect impacts by increasing visitation resulting in vandalism. Some of the motorized and non-motorized trails were converted from forest system or temporary roads and the sites were impacted by the original construction of the roads.

Looting and Vandalism

Intentional looting and vandalism of sites on public lands is a problem throughout Arizona. Some of these activities are conducted for illegal recreation and others for illegal gain. When a site is looted significant contextual information and parts of our history are stolen and destroyed. As transportation technology has advanced (i.e. four wheel drive) a greater number of roads have provided access to remote areas. The increasing number of roads and trails provides access to remote sites and provides looters a convenient method to easily transport heavy, awkward or delicate archaeological items and/or larger quantities of those items that previously would have been difficult to remove from the backcountry.

Studies conducted in the late 1970's and early 1980's on the behavior and impacts by looters documented that these individuals prefer small to large prehistoric masonry sites that are accessible by maintained roads, within a driving distance of 1-20 miles, and do not require walking more than a few hundred yards (Nickens, Larralde and Tucker 1981). Lightfoot (1978) found there is a correlation between the amount of illegal surface collecting of artifacts from sites and the distance and visibility of the site from a road. Francis (1978:130) determined that the degree of casual collection appears to be the most severe on sites that are located within 150m (492ft) of unimproved roads such as 4-wheel drive jeep trails.

Of the site records reviewed and condition data in heritage databases, looting and vandalism is documented for 225 sites. The Black Mesa and Lakeside Ranger Districts had 68 and 109 impacted sites, respectively. Thirteen sites have been pot hunted/vandalized on the Alpine Ranger District, 17 on the Clifton Ranger District, and 18 on the Springerville Ranger District. Pot hunting is used to describe when someone by hand or, in some cases, with a backhoe, excavated structures or other features in search of artifacts. Vandalism, which can represent the removal of artifacts or intentional damage, was listed for 17 sites. One site that consisted of a historic C.C.C. explosive storage building in Saffel Canyon was blown up by a small bomb by individuals trying to enter the building.

Lands

As of 1987 the ASNFs have acquired 17, 540 acres of private land and conveyed 4,462 acres of NF land into private ownership. Conveying cultural resources out of federal ownership is an adverse effect. Based on available records 52 eligible archaeological sites were adversely impacted. These adverse effects were mitigated through data recovery (excavations). Excavation involves the systematic destruction of an archaeological site using scientific methods to remove and document the significant scientific information.

Environmental Consequences

The land management plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carryout any project or activity. Because the land management plan does not authorize or mandate any site-specific projects or activities (including ground-disturbing actions) there can be no direct effects. However, there may be implications, or longer term environmental consequences, of managing the forests under this programmatic framework.

Under the provisions of the National Historic Preservation Act (NHPA 1966, as amended; 16 U.S.C. §470), adverse effects to cultural resources include a variety of criteria affecting the potential eligibility of cultural resources for inclusion on the National Register of Historic Places (36 CFR §800.9b). Specifically, effects may be deemed adverse according to the following (36 CFR §800.5[1]):

> An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

Cultural resource surveys for specific actions (e.g. timber sales, piñon-juniper treatments) would be conducted prior to approving site-specific projects in compliance with Federal law and Forest Service policy. Prior to the forests making a decision on a site-specific action that is subject to NHPA, the forests would complete archeological surveys to locate, evaluate sites for the NRHP and analyze the affects of the proposed use or activity

in compliance with the R3 programmatic agreement. Following the identification and recording of cultural resources, mitigation measures appropriate to the proposed undertaking would be implemented. Such measures would most likely include avoidance of cultural resources by redesigning the project boundaries, modifying construction plans, or excluding site areas from treatments. In cases where specific activities would constitute an adverse effect and avoidance could not be accomplished, the adverse effects would be resolved in accordance with 36 CFR 800.

Effects of Alternatives

Cultural resources, depending on their nature and composition, are subject to different types of impacts from vegetation management, fire, livestock grazing, infrastructure, recreation, looting and vandalism, and land adjustments All the alternatives propose treatments that result in restoring ecosystem health. This has the potential to reduce the potential adverse effects to cultural resources from uncharacteristic high intensity and high severity fires. These treatments would also lead to the restoration of natural processes and the landscape which in turn has the potential to restore the historic setting and cultural landscapes of the forests.

Ground-disturbing activities (including mechanical activities) are the dominant cause of potential impacts to cultural resources in all alternatives. The potential types of affects to cultural resources from the proposed treatments in the alternatives are the same. Differences however, may be found among the alternatives regarding the number of cultural resources that would be potentially impacted by the treatments.

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Heritage Program Management

National Register Sites and TCPs

The 1987 forest plan (Alternative A) has not been amended to reflect the 1992 requirements and amendments to the NHPA. The 1992 amendments clarified Section 110, language terms, and required each Federal agency to establish a historic preservation program. The program must provide for the identification and protection of the agency's historic properties; ensure that such properties are maintained and managed with due consideration for preservation of their historic values; and contain procedures to implement Section 106, which must be consistent with the ACHP regulations. Alternative A also does not address requirements of the Native American Graves Repatriation Act of 1990 (NAGPRA), E.O. 13007 Indian Sacred Sites, E.O. 13175 Consultation and Coordination with Indian Tribal Governments, and E.O. 13287 Preserve America. The focus of management and guidelines for forest resources within the 1987 plan were developed prior to the passage or issuance of these statutes which lead to more impacts to historic properties. Emphasis is on use of timber and multiple use activities that incorporate the location of archaeological sites and TCPs that may not be compatible with those uses. The action alternatives have incorporated the passage of these statues and issuance of executive orders providing for increased consideration and management to preserve historic properties for their historic and cultural values

Under all alternatives, the ASNFs would continue to fulfill its responsibilities to conduct non-project related inventory surveys and nominate sites that are eligible to the NRHP to protect and preserve cultural resources per Section 110 of NHPA, E.O. 11593, and Section 14 of Archaeological Resource Protection Act (ARPA). Internal and outside funding sources, researchers, partners and volunteers would be sought to assist in research and preservation projects. Public outreach and interpretation would continue to be provided through heritage programs, projects, and interpretive materials. The identification, evaluations, and analysis of the effects from proposed actions to cultural resources that are eligible, nominated, or listed on the NRHP would be completed to meet the requirements of Section 106 of NHPA.

Most of the discussion regarding impacts focuses on effects to archeological sites because they are discreet locations that are more easily identified. Traditional use areas accessed for the collection of traditional materials may also be impacted. The ASNFs consults with nine different tribal governments and one chapter of the Navajo Nation that have a cultural affiliation to the area. At present, Tribes have not identified concerns or issues that the alternatives would result in adverse impacts to known and unidentified TCPs. The Tribes have expressed interest on the affects to wildlife (eagles) and the need to prevent additional adverse impacts from activities and land exchanges to TCPs. Government to government consultation would continue between the ASNFs and the Tribes. If tribal consultation results in identification of additional, currently unknown, traditional uses and traditional cultural properties, impacts to those areas would be considered during site-specific environmental assessments.

Public Outreach and Education

In all alternatives, the ASNFs would continue to fulfill its responsibilities to promote and invest in public education and outreach to meet the intent NHPA Section 110, Executive Order 13287 Preserve America, and ARPA section 10(c). The forests' heritage program will continue to provide opportunities to the public to promote cultural resource stewardship and conservation through volunteer programs, recreation opportunities, interpretation, and presentations. These programs are intended to increase public awareness of the significance of the archaeological resources located on public lands and the need to protect those resources. This awareness may result in reducing the number incidents and severity of damage caused by looting, vandalism, and unintentional vandalism from recreational activities.

Infrastructure

In all of the alternatives infrastructure would be maintained. The 1987 forest plan (Alternative A) only specifies that the ASNFs will comply with NHPA. NHPA requires that adverse impacts be resolved, which usually results in the excavation and recovery of the significant and scientific information. Since Alternative A does not provide suitability standards and guidelines for infrastructure (e.g. roads, communications sites) that address cultural resources and TCPs, more TCPs have been adversely impacted over the life of the plan.

Alternatives B, C, and D would result in less potential of adverse effects to cultural resources. Standards and guidelines in the proposed plan provide direction for areas (e.g. high site density, on TCPs and sacred sites) not suitable for new infrastructure (e.g. permanent roads, communications sites and powerlines). This would increase the potential of the forests meeting the desired conditions for cultural resources by reducing the type of proposed actions that may adversely affect those resources in those locations and reduce the potential of causing additional impacts to TCPs.

Livestock Grazing

In all alternatives livestock grazing would continue. Site-specific actions and the level of permitted use would be determined at the time of the project-level decision. Potential effects from grazing are the same for all the alternatives since there would be no change by alternative in the allotments available for livestock grazing. It is recognized that cultural resources have been subjected to grazing for over a hundred years, at levels much higher than current grazing practices, and that some degree of impacts may have already occurred. Livestock grazing can negatively impact sites by trampling, artifact breakage, soil compaction, soil removal, toppling masonry walls and other types of damage to features as livestock walk through a site. Grazing can indirectly impact sites through loss of ground cover which in turn leads to erosion. Sites sensitive to grazing impacts include but not limited to ruins with free-standing walls, historic structures and TCPs. In locations where cattle are likely to be attracted to or congregate, rock shelters and rock art sites may also be sensitive sites.

The effects on cultural resources will be analyzed by allotment at the project-level. The forests will follow appendix H of the R3 programmatic agreement for rangeland management to meet Section 106 responsibilities. The protocol defines the procedures by which cultural resources (listed, eligible and unevaluated sites) would be considered in planning and conducting rangeland management activities.

Fire

Non-mechanized treatments include using fire, planned and unplanned ignitions (e.g. prescribed and wildland fire) to address vegetation conditions and objectives. In the past, frequent low intensity fires occurred across the forests. Generally, low intensity fires have not adversely impacted prehistoric sites that are not fire sensitive or composed of combustible material. Conversely, most historic sites are either combustible or include combustible cultural material.

Under **all alternatives**, the use of fire could result in adverse impacts, including historic sites completely burned down, prehistoric rock structures spalling apart from exposure to very high temperatures, refiring of ceramic material, melting obsidian artifacts (caused by high intensity fire), accelerated erosion of site features caused by hydrophobic soils (caused from high intensity and long duration fires), killed trees falling and uprooting the

ground surface thereby displacing or damaging cultural features and structures, creation of burned stump holes that result in erosion, and removal of vegetation from the ground surface that exposes cultural materials to increased erosion and the potential for theft.

Suppression responses may adversely affect cultural resources by altering and/or damaging the cultural materials by construction of hand and mechanical control lines that remove, crush and or displace cultural materials and features. Large and small fire camps may cause direct and indirect effects similar to camping (see previous impacts from recreation effects). Some fire retardants may permanently stain the cultural materials.

The use of fire as a management tool for vegetation treatments has the most potential to effect cultural resources in Alternative D. VDDT modeling shows that Alternative D has the potential to result in a higher amount of acres in the ponderosa pine and piñon-juniper vegetation types affected by mixed severity and high severity (stand replacing) fire to meet desired conditions. Since alternative D emphasizes natural processes (fire), this alternative has a higher potential for temporary indirect impacts from erosion and vandalism caused from exposure of cultural materials and features by burning off the vegetation.

Alternative B has the next highest potential for mixed severity and stand replacement fire. Mixed severity fire effects do not directly equate to sites being permanently altered and damaged. The effects to many sites resulting from mixed severity fires depends on the site type and the temperature and duration of heat on the ground surface. Alternative B will affect more acres by mixed and high severity fire treatments than Alternative C. Potentially resulting in a higher number of cultural resources that could be adversely affected. Alternative A has the least potential for fire treatments to result in high severity that could adversely affect cultural resources.

Table 8. Annual burning treatments (acres) and estimated fire severity by alternative.

Alternative	Low Severity		Mixed Severity		High Severity	
Treatment Level	Low	High	Low	High	Low	High
Alternative A	5,379		845		951	
Alternative B	837	5,859	12,035	35,181	864	2,379
Alternative C	566	5,566	2,426	15,737	130	1,284
Alternative D	1,748	11,653	15,800	62,905	1,080	3,765
* Based on the past 25-year average of burning treatments. No breakdown of burn type available, however, the vast majority (95%) is estimated to be low severity.						

Table 9. Average burning treatments (acres) by PNVT and the estimated number of sites within treatment areas.

Vegetation Type (PNVT)	PNVT Total Acres of NFS	# of surveyed acres per site	Alternative A		Alternative B		Alternative C		Alternative D	
			Average Acres RX Burn	Sites	Average Acres RX Burn	Sites	Average Acres RX Burn	Sites	Average Acres RX Burn	Sites
Ponderosa Pine Forest	602,206	85	3,150	37	6,300	74	5,614	66	12,679	149
Dry Mixed Conifer Forest	147,885	430	800	2	1,663	4	1,525	4	3,381	8
Wet Mixed Conifer Forest	177,995	959	950	1	1900	2	1,725	2	3,824	4
Spruce-Fir Forest	17,667	*[1]	100	Unk	347	Unk	493	Unk	555	Unk
Madrean Pine-Oak Woodland	394,927	76	1,063	0	7,429	0	3,125	0	13,029	0
Piñon-Juniper Woodland	222,166	31	713	23	914	29	375	12	2,009	65
Interior Chaparral	55,981	83	0	0	0	0	0	0	0	0
Great Basin Grassland	185,523	60	75	1	4,100	68	0	0	10,500	175
Semi-desert Grassland	106,952	98	27	0	2500	0	0	0	2500	0
Montane/Subalp Grasslands	51,559	241	0	0	0	0	0	0	0	0
Riparian Forests	48,241	108	0	0	350	3	0	0	450	4
Totals[2]:			6,844	64	28,929	181	12,855	83	48,926	405

[1] Five sites have been recorded in Spruce Fir forests but they were not located in the complete survey areas. UNK= Unknown . Sites = the estimated number of sites in the treatment area based on the number of surveyed acres per site.
[2] Note: The data provides relative counts to see differences between PNVTs. The percentage of acres surveyed only includes GIS heritage survey data for complete/intensive surveys. Linear, point, and sample survey areas in the GIS heritage survey layer include acres that are completely surveyed but the data was excluded from this analysis because specific spatial data is missing.

Vegetation Management

(Timber Harvesting and Piñon-Juniper Treatments)

Mechanical treatments refer to a variety of possible "tools" to meet objectives. These include, but are not limited to: hand thinning by chainsaws; feller-bunchers to cut trees and lop slash; skidders to move material to landings; bulldozers to push and pile trees and slash; heavy equipment to topple trees over by chaining; and other specialized heavy equipment that can be driven over the ground surface to cut, chop, grind, crush, and lop trees and shrubs. Vegetation is mechanically cleared from areas (landings) that are approximately ¼ to 1 acre in size with an average of one landing every 20 acres to assist in removing and accessing materials. Some temporary roads may be constructed. Some of the major forest system roads and highways that would be used for access and transportation are historic linear properties that could be or have been determined eligible

for the State or National Register of Historic Places (e.g. Forest Road 300; State Route.77 and 260, HWY 191)

Under all the alternatives mechanical treatments to remove timber could damage or destroyed sites by direct adverse impacts that cause the removal, displacement, breakage, or destruction of cultural material, features, and structures. Activities that have the potential to result in adverse impacts included but are not limited to: construction of hauling roads and landing, movement of heavy equipment across the ground surface, pushing and crushing and piling harvest material and slash on or across the ground surface, skidding of trees and indirect impacts from removal of overstory, which can lead to erosion, and cutting and the removal of historic features (i.e., aspen dendroglyphs, blazed trees, culturally modified/peeled trees, etc.).

Alternatives that propose to treat more acres in vegetation types that have a higher density of sites have a higher potential for effects (see table 10). Alternative A has the least amount of potential effects. Alternative C has a higher potential for direct impacts from ground disturbing treatments than Alternatives B or D. Management of cultural resources would have the most effect on mechanized treatments in Alternative C, based on the average number of acres proposed for mechanized treatment for vegetation types with the most sites and the average estimated cost per acre for cultural resource inventories. Alternative C would potentially result in the highest cost to the government to complete the potential compliance for cultural resources. The next highest costs would be for Alternative B, followed by Alternatives D and A (see table 11).

Table 10. Average mechanical treatments (acres) by PNVT and the estimated number of sites within treatment areas

Vegetation Type (PNVT)	PNVT Total Acres of NFS	# of surveyed acres per site	Alternative A		Alternative B		Alternative C		Alternative D	
			Average # of Acres Mechanical	Sites	Average # of Acres Mechanical	Sites	Average # of Acres Mechanical	Sites	Average # of Acres Mechanical	Sites
Ponderosa Pine Forest	602,206	85	7,119	84	6,289	74	13,341	157	5,434	64
Dry Mixed Conifer Forest	147,885	430	1,808	4	1,584	4	3,338	8	1,380	3
Wet Mixed Conifer Forest	177,995	959	2,147	2	1,900	2	4,023	4	1,640	2
Spruce-Fir Forest	17,667	*[1]	108	Unk	55	Unk	112	Unk	21	Unk
Madrean Pine-Oak Woodland	394,927	76	0	0	0	0	0	0	0	0
Piñon-Juniper Woodland	222,166	31	500	16	1,561	50	2,633	85	2,358	76
Interior Chaparral	55,981	83	N/A	0	N/A	0	N/A	0	N/A	0
Great Basin Grassland	185,523	60	500	8	7,702	128	0	0	4,621	77
Semi-desert Grassland	106,952	98	0	0	0	0	0	0	0	0
Montane/Subalpine Grasslands	51,559	241	0	0	500	2	500	2	500	2
Riparian Forests	48,241	108	0	0	0.7	0	0	0	0.9	0
Totals[2]:	2,011,102		12,182	115	19,590	260	23,997	256	15,953	224

[1] Five sites have been recorded in Spruce Fir forests but they were not located in the complete survey areas. UNK= Unknown. Sites = the estimated number of sites in the treatment area based on number of surveyed acres per site.
[2] Note: The data provides relative counts to see differences between PNVTs. The number of surveyed acres per site is based on the number of sites located in complete /intensive surveys areas. Linear, point, and sample survey areas in the GIS heritage survey layer include acres that are completely surveyed but the data was excluded from this analysis because specific spatial data is missing.

Table 11. Estimated average annual costs for cultural resource compliance for 100% survey of the average number of acres proposed for mechanical treatments in vegetation types with the highest site densities. Costs per acre may be higher or lower based on site-specific conditions. Note: ASNFs administrative tasks (e.g. report reviews, database management) and contract oversight are not included in costs per acre.

Vegetation Type (PNVT)	Estimated Average cost per acre	Alternative A Mechanized		Alternative B Mechanized		Alternative C Mechanized		Alternative D Mechanized	
		Acres	Cost	Acres	Cost	Acres	Cost	Acres	Cost
Ponderosa Pine Forest	30	7,119	**213,570**	6,289	**188,670**	13,341	**400,230**	5,434	**163,020**
Piñon-Juniper Woodland	30	500	**15,000**	1,561	**48,830**	2,633	**78,990**	2,358	**70,740**
Great Basin Grassland	30	500	**15,000**	7,702	**231,060**	0	**0**	4,621	**138,630**
Totals:		8,119	**243,570**	15,552	**468,560**	15,974	**479,220**	12,413	**372,390**

Recreation Activities

The 1987 plan (Alternative A) has the most potential to have adverse impacts to cultural resources. Alternative A does not provide standards, and suitability guidelines for motorized and non-motorized recreation that address cultural resources. This has resulted in more cultural resources being adversely affected over the life of the plan. **Alternative A** would continue to allow motorized cross-country travel. Unrestricted motorized access to remote sites increases the potential for vandalism, including illegal excavation (looting), damage or destruction to standing architecture or rock art, and collection of surface artifacts. Motorized use may remove vegetation that protects and covers archaeological materials. When cultural materials are exposed, the more decorative artifacts and collectable historic objects may disappear through illegal collecting. Alternative A has the least potential to meet the desired conditions for cultural resources.

The action alternatives would result in less potential for adverse effects to cultural resources and have a higher potential to move the forests toward the desired conditions for cultural resources. Standards and guidelines in the action alternatives provide direction for areas (high site density, on TCPs and sacred sites) where certain activities (non-motorized, mechanized, motorized travel) would not be suitable. These alternatives would eliminate motorized cross-country travel. The potential to disturb cultural resources would be reduced because fewer lands would be open to motor vehicle use, resulting in a beneficial effect to cultural resources. The adverse effects to remote cultural sites from motorized cross-country travel would be reduced and, in some areas, stopped. These action alternatives also place a greater emphasis on the provision of recreation opportunities. This may result in more developed interpretive sites, and development of interpretive cultural resource brochures for routes and trails. Alternative C, because of the emphasis on developed recreation, provides the most potential to restore, stabilize, and

preserve historic facilities that could be used for public use. For example, historic facilities could be restored and maintained as part of the cabin rental program.

Alternative D recommends the most acres for wilderness. It provides the most potential to benefit cultural resources. Protection of wilderness values indirectly protects cultural resources by eliminating certain management activities that have the potential to adversely affect cultural resources (e.g. mechanized treatments and uses, construction of roads and facilities). Alternatives B and C would have the next highest potential to benefit cultural resources. Areas recommended for wilderness in both of these alternatives contain cultural resources that are significant at the national level. Managing these areas for wilderness values would have the highest potential to protect these resources and keep them generally free from adverse effects. These alternatives have the potential to reduce the amount of projects that involve ground-disturbance, which would result in reducing the amount of inventory surveys in these areas that would be conducted to identify and evaluate sites for the NRHP. Most cultural resource inventory surveys are conducted for ground disturbing activities to comply with Section 106. Alternative A does not recommend additional wilderness.

Looting and Vandalism

Alternatives B and C which propose the most acres for mechanized treatments in vegetation types with a higher density of sites have the most potential to increase incidents and damage from looting and vandalism. More incidents of looting are found in areas where there is more human activity and accessibility to sites. There would be less risk associated with looting and vandalism in Alternatives A and D.

Lands

All the alternatives have the same potential to impact cultural resources from land adjustments. Land adjustments have the potential to adversely affect the use and characteristics of cultural resources. Conveying cultural resources that are eligible or listed on the National Register out of federal ownership it is an adverse effect. The resources would no longer be protected and managed under Federal laws, regulations and Forest Service policy. Also, exchanges of federal lands may affect and/or prevent the access and use of traditional cultural properties (TCP) by American Indian Tribes. Once the lands are transferred out of federal ownership the Tribes would not be guaranteed the same rights of access and use of the TCP or area for traditional purposes. Federal laws, executive orders, regulations, and forest service policy regarding American Indian rights and interests would no longer apply.

Land adjustments may also potentially have a positive effect on cultural resources. Cultural resources on acquired private lands would come under protection of federal laws and management. Acquired private lands that include TCPs that were previously inaccessible to Tribes would be accessible for traditional proposes. No specific areas for acquisition or exchange are proposed as part of the alternatives. Site-specific analysis would be completed at the time a proposal is under consideration.

Relationship of Short-Term Uses and Long-Term Productivity

Traditional cultural areas used for collecting forest and mineral resources could be affected by the temporary closure of areas from wildland fires and treatments. Many of the traditionally used plants respond to fire by increasing productivity. Alternatives D and B that propose the most acres treated by fire would potentially increase the long term productivity of traditionally used forest resources and availability of those resources across the landscape. Access to visiting cultural resources (archaeological sites and TCPs) could be affected in the short term during implementation of prescribe burn treatments.

Conducting prescribed burns have the potential to restore the natural and cultural landscape, and the natural fire regime, reducing the potential for permanent adverse effects from high intensity, high severity fires. Mechanized treatments have the similar benefits to cultural resources as fire treatments because they would reduce the potential for permanent adverse effects from fire, but these treatments have the highest potential for long term indirect effects from erosion caused from intensive ground disturbance near sites. Also, slash from mechanized treatments is often piled burned resulting more locations with hydrophobic soils, increasing erosion to sites if the piles were located near sites.

Cumulative Environmental Consequences

The cumulative effects on cultural resources should take into account all surface-altering actions that have occurred or are likely to occur within the forests. Many recorded sites on the forests are at least regionally significant, and some are nationally significant. This regional or national importance of some sites within the forests reinforces the need for protecting significant local cultural resources that may be affected from cumulative impacts of management activities within the forests and region. Federal, tribal and state lands adjacent to the ASNF comprised the analysis area for cumulative effects.

Current and previous Forest Service management activities, public resource procurement and recreational use and natural processes have impacted cultural resources. Multiple archaeological sites will be adversely affected by U.S. 60 Silverking to Superior project and improvements along SR260 Overgaard to Show Low. Improvements to SR 77 may have additional adverse effects to prehistoric archaeological sites. Several land exchanges that involve forest lands may lead to adverse effects to multiple archaeological sites and one known TCP. Most of these sites would require data recovery (excavation) to resolve adverse effects. Data recovery involves the scientific recovery of significant information through destructive methods. The Coconino and Kaibab National Forests are in the process of completing a draft Environmental Impact Statement for the Four Forest Restoration Initiative (4FRI). The proposed action involves large scale vegetation treatments projects using mechanized vegetation removal and prescribed fire as treatments. The proposed alternatives are expected to result in no adverse effects to cultural resources and reduce the potential for permanent adverse effects from uncharacteristic high intensity and high severity fires. Inventory surveys that would be

conducted for 4FRI would result in recording archaeological sites and TCPs, providing information for better management of cultural resources and increasing scientific knowledge. Under all alternatives, implementation of the proposed treatments for 4FRI and future Apache-Sitgreaves treatments in the proposed plan would result in a beneficial indirect cumulative impact to cultural resources by increasing the amount of acres surveyed for cultural resources and reducing the potential adverse affects from uncharacteristic wildfires.

Unavoidable Adverse Impacts

The land management plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carryout any project or activity. Before any ground-disturbing actions take place, they must be authorized in a subsequent site-specific environmental analysis. Therefore none of the alternatives cause unavoidable adverse impacts. Mechanisms are in place to monitor and use adaptive management principles in order to help alleviate any unanticipated impacts that need to be addressed singularly or cumulatively.

Irreversible and Irretrievable Commitment of Resources

The land management plan provides a programmatic framework that guides site-specific actions but does not authorize, fund, or carryout any project or activity. Because the land management plan does not authorize or mandate any site-specific project or activity (including ground-disturbing actions), none of the alternatives cause an irreversible or irretrievable commitment of resources.

Adaptive Management

All alternatives assume the use of adaptive management principles. Forest Service decisions are made as part of an on-going process, including planning, implementing projects, and monitoring and evaluation. The land management plan identifies a monitoring program. Monitoring the results of actions will provide a flow of information that may indicate the need to change a course of action or the land management plan. Scientific findings and the needs of society may also indicate the need to adapt resource management to new information.

Consistency with Law, Regulation, and Policy

All alternatives are designed to guide Apache-Sitgreaves National Forests' management activities in meeting federal law, regulations, and policy.

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