



**National Park Service
U.S. Department of the Interior
Montezuma Castle National Monument
Tuzigoot National Monument
Camp Verde, Arizona**

Finding Of No Significant Impact Fire Management Plan

Background

Montezuma Castle and Tuzigoot National Monuments are in the Verde Valley of central Arizona in Yavapai County. Montezuma Castle is approximately 5 miles by road north-northwest of the city of Camp Verde. The Montezuma Well Unit of Montezuma Castle is located farther north approximately 13 miles by road north-northwest of the city of Camp Verde, and Tuzigoot is 3 miles northeast of the town of Clarkdale. Together they comprise approximately 1,386 acres.

Montezuma Castle National Monument consists of two detached units. Montezuma Castle is a prehistoric 20-room, 5-story cliff dwelling built by the Southern Sinagua people. Montezuma Well is a large, spring-fed travertine pool that contains pueblos, alcoves and cliff dwellings. Montezuma Castle National Monument was established in 1906 to protect one of the best-preserved cliff dwellings in the United States. Land was later added to the monument to protect additional sensitive resources and Beaver Creek. Montezuma Well was added to the monument in 1943.

Tuzigoot National Monument, established in 1939, protects prehistoric and historic resources, including an 87-room dwelling built by the Southern Sinagua. The monument includes the spring-fed Tavasci Marsh, used by early Native Americans as well as Anglo-American farmers, ranchers, and miners. Tavasci Marsh was added to the Monument in December 2005. Over a century of farming greatly changed the topography and ecology of the marsh.

In compliance with the National Environmental Policy Act (NEPA), the National Park Service (NPS) prepared an environmental assessment (EA) to examine alternatives and environmental impacts associated with the proposed new Fire Management Plan (FMP) for Montezuma Castle and Tuzigoot National Monuments.

The National Park Service *Management Policies 2006* and Director's Order #18 require that "each park with vegetation capable of burning would prepare a fire management plan to guide a fire management program that is responsive to the park's natural and cultural resources objectives and to safety considerations for park visitors, employees, and developed facilities". Parks with an approved fire management plan and accompanying National Environmental Policy Act compliance may use wildfire to achieve resource benefits in predetermined fire management units. The 2008 Interagency Standards for Fire and Fire Aviation Operations "Red Book" states that the Superintendent will "identify resource management objectives in a current FMP." The activities defined in the fire management plan will be implemented in accordance with agency and departmental policy, including, but not limited to, procedural updates contained in the following documents:

- Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide (September 2006)
- Wildland Fire Use Implementation Procedures Reference Guide (May 2005, as amended in March 2006)
- Interagency Standards for Fire and Fire Aviation Operations (January 2008; updated January 2013)
- Direction to Leaders – 2008 Action Plan
- Guidance for Implementation of Federal Wildland Fire Management Policy (February 2009)

Montezuma Castle and Tuzigoot National Monuments currently follow the 2004 *Fire Management Plan* to guide their wildland fire program. The plan was developed with the Saguaro National Park Fire Management Office, which leads fire management activities at both monuments. In the past, national park system units could use the 2003 Healthy Forest Initiative Categorical Exclusion to be in compliance with National Environmental Policy Act requirements. The Healthy Forest Initiative Categorical Exclusion was codified in "Interim Guidance Director's Order 12 Categorical Exclusions" on May 22, 2009. The reference for this categorical exclusion under Director's Order #12 guidance is 3.4 G, 1. Based on National Park Service reinterpretation of policy in response to recent case law, the decision was made to discontinue the use of the 2003 Healthy Forest Initiative Categorical Exclusion for compliance with the National Environmental Policy Act, and to prepare an environmental assessment in support of the Monuments' Fire Management Plan.

The environmental assessment for the fire management plan brings the monuments into compliance with Director's Order #18 and National Environmental Policy Act requirements and allows Montezuma Castle and Tuzigoot National Monuments to continue implementing applicable fire management programs.

A new FMP and supporting EA is necessary for these reasons:

- The NPS has directed discontinued use of the Healthy Forest Initiative categorical exclusion (HFI CE). The HFI CE was the supporting NEPA document for the MOCATUZI FMP. Therefore, a new NEPA document and new FMP is required by NPS direction, and RM-18.
- To incorporate current interpretation of federal fire policy, and associated terminology.
- To incorporate most recent scientific and technological advances pertaining to fire management.

Selected Action

In accordance with the National Environmental Policy Act of 1969 (NEPA), the NPS prepared an Environmental Assessment/Assessment of Effect (EA/AEF) for the FMP to provide for public involvement in the planning process, and to examine alternatives and their potential impacts on the environment. Two alternatives were examined: No Action Alternative and Proposed Action or Preferred Alternative. Topics of concern that were identified during scoping and evaluated in the EA/AEF include: geology and soils; vegetation; special status species; wildlife; air quality; soundscapes; hydrology and water quality; visitor use and experience; monument operations; archeological and ethnographic resources; and historic structures and cultural landscapes.

After a thorough review of fire management objectives, potential impacts of the alternatives, consideration of public comment, and after consultation with the culturally-affiliated tribes, State Historic Preservation Office, State Agencies and the U.S. Fish and Wildlife Service (USFWS), the selected action has been carefully chosen for implementation. This alternative is consistent with Federal policy, which prioritizes public health and safety, protecting at-risk communities and infrastructure, managing for natural historic fire regimes, protecting sensitive resources, and collaborating with other agencies and stakeholders.

The selected action will allow for implementation of a range of fire management activities. These activities and treatments will be centered on public and firefighter safety, communities identified as at risk from wildfires (wildland-urban interface), current condition class, and collaboration with other agencies and stakeholders. These activities will be part of potential planned events (prescribed burns, mechanical or manual fuel reduction, and ecological restoration) and/or in response to unplanned (wildland fires) events. Pile burning, which has been occurring at all three units, will also be considered for mechanical and/or manual hazardous fuels reduction. Prescribed burns may be used in order to maintain open native grassland areas at the Montezuma Well unit of Montezuma Castle National Monument.

Project activities within the next five years at Montezuma Well are cutting and thinning of 40 acres and pile burning of 12 acres. Project activities within the next five years at Tuzigoot are 4 acres of cutting and thinning. Prescribed burning of Tavaschi Marsh is outside the scope of this proposed project and will require additional compliance prior to implementation. Due to the small size of the monuments and proximity of private property, the importance of its cultural resources, and the sensitivity of native plant communities to fire, wildfires will be suppressed. The exact nature of that response to put the fire out may vary, based on firefighter and public safety and values to be protected. Foot and/or vehicle traffic to access the fire, water drops, burnouts to lessen fuel levels, and construction of firelines are possible responses.

Mitigation Measures

The following practices will be incorporated into planned projects; emergency responses to wildland fire may supersede these measures for the protection of human life.

- Because disturbed soils are susceptible to erosion until revegetation takes place, standard erosion control measures such as silt fences and/or sand bags will be used to minimize any potential soil erosion.
- To reduce noise and emissions, heavy equipment will not be permitted to idle for long periods of time.
- To minimize possible petrochemical leaks from heavy equipment, the equipment operators will regularly monitor and check heavy equipment to identify and repair any leaks.
- Project workers and supervisors will be informed about special status species.
- All ground disturbances will be monitored by the monument archeologist and/or archeological technicians. Should fire activities threaten any known sites or unearth previously undiscovered cultural resources, work will be stopped in the area of any discovery and the monument will consult with the Arizona State Historic Preservation Office and the Advisory Council on Historic Preservation, as necessary, according to Section 36 CFR 800.13, Post Review Discoveries. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) will be followed.
- The National Park Service will ensure that all workers, contractors, and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. Project workers and supervisors will be informed about the special sensitivity of the monument's values, regulations, and appropriate housekeeping.
- Project activities generating high levels of noise will be avoided during the sensitive breeding season from March through September as much as possible.
- Activities generating potential soil runoff events will be avoided during the heavy monsoon period of July-September.

Additionally, the National Park Service (Procedural Manual #77-1: *Wetland Protection*) has identified conditions for the selected action:

- Effects on hydrology: Action must have only negligible effects on site hydrology, including flow, circulation, velocities, hydroperiods, water level fluctuations, and other characteristics. Care must be taken to avoid any rutting caused by vehicles or equipment.
- Water quality protection and certification: Action is conducted so as to avoid degrading water quality to the maximum extent practicable. Measures must be employed to prevent or control spills of fuels, lubricants, or other contaminants from entering the waterway or wetland. Action is consistent with state water quality standards and Clean Water Act Section 401 certification requirements.
- Erosion and siltation controls: Appropriate erosion and siltation controls must be maintained during construction, and all exposed soil or fill material must be permanently stabilized at the earliest practicable date.
- Effects on fauna: Action must have only negligible effects on normal movement, migration, reproduction, or health of aquatic or terrestrial fauna, including at low flow conditions
- Heavy equipment use: Heavy equipment use in wetlands must be avoided if possible. Heavy equipment used in wetlands must be placed on mats, or other measures must be taken to minimize soil and plant root disturbance and to preserve preconstruction elevations.
- Topsoil storage and reuse: Revegetation of disturbed soil areas should be facilitated by salvaging and storing existing topsoil and reusing it in restoration efforts in accordance with National Park Service policies and guidance. Topsoil storage must be for as short a time as possible to prevent loss of seed and root viability, loss of organic matter, and degradation of the soil microbial community.
- Native plants: Where plantings or seeding are required, native plant material must be obtained and used in accordance with National Park Service policies and guidance. Management techniques must be implemented to foster rapid development of target native plant communities and to eliminate invasion by exotic or other undesirable species.
- Endangered species: Action must not jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, including degradation of critical habitat.

Alternatives Considered

Two alternatives were evaluated in the EA including the no action alternative, and one action alternative. Under the no action alternative, the monuments would suppress all fires, and no planned projects (manual/mechanical, and prescribed fire fuel reduction projects) would be implemented. The action alternative, described herein as the selected action, includes a management plan to reduce fire fuels, thereby reducing disturbances caused by fire.

Environmentally Preferable Alternative

According to the CEQ regulations implementing NEPA (43 CFR 46.30), the environmentally preferable alternative is the alternative "that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified upon consideration and weighing by the Responsible Official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative."

The selected action is the environmentally preferable alternative for several reasons. The selected action allows for flexibility in response to wildfires and provides more opportunities for management of hazardous fuels. Under the selected action, managers may select a combination of treatments of hazardous fuels, and thus will be most effective for protection of natural and cultural resources. By reducing fuels, the fire management plan will provide for the preservation of natural and cultural resources, including protection from unwanted wildfires with fewer disturbances.

Why the Selected Action Will Not Have a Significant Effect on the Human Environment

As defined in 40 CFR §1508.27, significance is determined by examining the context (including duration) of an impact, and its intensity, including a consideration of the criteria that follow. Based on the analysis in the EA, which is summarized in the following sections, the NPS has determined that the selected alternative can be implemented without significant adverse effects. All impact threshold definitions (negligible, minor, moderate, major) referred to in this FONSI are defined in the EA.

Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial

The EA/AEF analyzed potential impacts of the actions on all topics identified during internal and public scoping. There were no major impacts, either beneficial or adverse. There will be long-term beneficial impacts for most impact topics as fuels reduction objectives are met. Most adverse impacts will be negligible to minor and short term, while a few adverse impacts will be negligible to moderate and long-term. The impacts from suppressing wildfires have the greatest potential for adverse impacts to resources. Reducing fuels adjacent to sensitive resources will reduce the fire severity, and fire will be excluded from the immediate site as necessary to protect the resource. Resources of specific concern include cultural landscapes, archeological resources, ethnographic resources, historic structures and special status species. A complete list of mitigation measures can be found on pages 4 – 5 of this document.

Not all of the mitigation measures will be applied in all situations; the measures that will reduce or negate adverse impacts to resources will be applied to the greatest extent possible without compromising public and firefighter health and safety. The appropriate mitigation measures will be incorporated in planned projects; responses to unplanned wildland fire ignitions will include appropriate mitigation measures when possible, and will most likely be successful.

The degree to which the selected action affects public health or safety

Public health and safety is a primary concern of the selected action. Reducing wildland fire intensity by implementing planned fuel reduction projects will result in the protection of life and property. Potential fuel reduction projects pose very little threat to visitors, adjacent residents, or staff. Planned manual fuel reduction projects and/or prescribed burns could minimize the frequency and intensity of unplanned wildland fire by reducing fuels, therefore resulting in long-term beneficial effects to health and safety. Unplanned wildland fires pose some inherent risk to the human environment.

Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas

Montezuma Castle and Tuzigoot National Monuments preserve archeological sites representing the Southern Sinagua archeological culture. These areas also include ecologically critical areas such as riparian habitat.

Vegetation at the monuments is varied. Typically the fuels consist of mesquite, fourwing saltbush, cattails, and creosote. Ground fuels consist mostly of shrubs, native bunch grasses, and exotic annual grasses with the exception of cattails and bulrushes in Tavaschi Marsh at Tuzigoot. Extreme fire years in the grasslands are due to increased spring rainfall promoting new growth followed by a period of hot and dry weather. All monuments have had few fires; however, there is potential for fire to carry given the current fuel conditions, especially Tuzigoot with the dense marsh cattails and to a lesser extent Montezuma Castle and Montezuma Well. All three monuments have the potential for high severity crown fires in the riparian vegetation, with a high potential for spotting.

Impacts from the selected action were identified in the E/AEF. It was determined that impacts are negligible to moderate and will cause no significant effects on special status species, wildlife, wetlands or historic or cultural resources. Prime and unique farmlands, wild and scenic rivers and wilderness areas do not exist within the Monuments.

The degree to which effects on the quality of the human environment are likely to be highly controversial

The NPS selected action is consistent with accepted fire management strategies that are currently employed at other NPS units and other adjacent Federal lands. Based upon public and agency involvement in the planning process and comments received during scoping efforts and on the EA/AEF, the effects of the selected action are not highly controversial, nor is it expected to have future controversial effects on the quality of the human environment.

The degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks

The risks to the quality of the human environment associated with the selected action will be adverse and beneficial. Unplanned wildland fires pose some inherent risk to the human environment. Impacts of these unplanned wildland fires, which are not unique, but which may be uncertain or unknown because of the many variables associated with such events. No additional unique or unknown risks to the quality of the human environment were identified.

The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration

The activities identified as part of the selected action are widely accepted under Federal fire management and NPS policies. Implementing the selected action neither establishes a NPS precedent for future actions with significant effects nor represents a decision in principle about a future consideration.

Whether the action is related to other actions with individually insignificant, but cumulatively significant impacts

No significant cumulative effects were identified in the EA/AEF. Impacts of the selected action on geology and soils, vegetation, special status species, wildlife, air quality, soundscapes, hydrology/water quality, visitor use and experience, monument operations, archaeological and ethnographic resources, and historic structures and cultural landscapes were identified in the EA/AEF. Cumulative impacts were determined by combining the impacts of the selected action with other past, present, and reasonably foreseeable future actions. The selected action results in beneficial or adverse cumulative impacts ranging in intensity from none to minor. Therefore, the selected action will not contribute or result in significant cumulative impacts.

The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed on the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources

The Environmental Consequences section of the EA/AEF analyzed effects of implementing the proposed Fire Management Plan. Due to mitigation measures implemented during fire management actions and unplanned fire events, the analysis concluded a finding of *No Adverse Effect on Historic Properties*, including archaeological resources, cultural landscapes, historic buildings, and ethnographic resources. Site specific consultation would be completed for activities not included in the EA/AEF. The Arizona State Historic Preservation Office concurred with this finding in a consultation letter dated August 2, 2012.

The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be cortical under the Endangered Species Act of 1973

Consultation with the United States Fish and Wildlife Service (USFWS) was initiated on April 1, 2011 with an NPS request for input on a species list and notice of proposed environmental assessment. That letter also served as a scoping letter to the USFWS. A Biological Assessment (BA) and request to initiate consultation was sent to the USFWS on September 4, 2012. A determination of *May affect-not likely to adversely affect* determination was made for seven species including the Razorback sucker, Gila chub, Loach minnow, Spikedace, Colorado pike minnow (NLAA 10j population) Southwestern Willow Flycatcher and Yuma Clapper Rail. The USFWS concurred with this finding in a letter dated October 23, 2012.

Whether the action threatens a violation of Federal, state, or local law or requirements imposed for the protection of the environment

This action violates no federal, state, or local environmental protection laws.

PUBLIC INVOLVEMENT

The environmental assessment/assessment of effect form was made available for public review and comment from August 6, 2012 to September 5, 2012. To notify the public of this review period, a letter was mailed to stakeholders, American Indian tribes, interested parties, and government agencies. Copies of the document were available in local repositories, and posted on the NPS PEPC website at <http://parkplanning,nps.gov/moca>. One comment was received from the Ak-Chin Indian Community, but resulted in no changes to the EA/AEF. Letters of concurrence were received from the Arizona State Historic Preservation Officer to complete the Section 106 of the National Historic Preservation Act, and from the Ecological Services/ U.S. Fish and Wildlife Services to complete the Section 7 of the Endangered Species Act. No substantive comments were received.

Conclusion

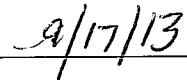
As described above, the selected action does not constitute an action meeting the criteria that normally require preparation of an environmental impact statement (EIS). The selected action will not have a significant effect on the human environment. Environmental impacts that could occur are limited in context and intensity, with generally adverse impacts that range from direct to indirect, short- to long-term, and negligible to minor. There are no unmitigated adverse effects on public health, public safety, threatened or endangered species, sites or districts listed in or eligible for listing in the National Register of Historic Places, or other unique characteristics of the region. No highly controversial or unique risks, significant cumulative effects, or elements of precedence were identified. Uncertain and unknown risks may occur from unplanned wildland fires. Implementation of the selected action will not violate any federal, state, or local environmental protection law.

Based on the foregoing, it has been determined that an EIS is not required for this project and thus will not be prepared.

Approved:



Laura E. Joss
Acting Regional Director, Intermountain Region



Date

Errata Sheets
**Fire Management Plan Environmental Assessment/
Assessment Of Effect**
**Montezuma Castle National Monument and
Tuzigoot National Monument**

According to NPS policy, substantive comments are those that 1) question the accuracy of the information in the EA, 2) question the adequacy of the environmental analysis, 3) present reasonable alternatives that were not presented in the EA, or 4) cause changes or revisions in the proposal.

Some substantive comments may result in changes to the text of the EA, in which case they are addressed in the *Text Changes* section of the Errata Sheets. Other substantive comments may require a more thorough explanatory response and are addressed in the *Response To Comments* section. NPS responds to all substantive comments in either or both of these sections.

Three comment letters concerning the Montezuma Castle National Monument and Tuzigoot National Monument Environmental Assessment/Assessment were received during the public comment period. The Ak-Chin Indian Community stated that there were no comments. The Arizona State Historic Preservation Officer issued a letter of concurrence on the Monument's Section 106/National Historic Preservation Act consultation. The Arizona Ecological Services Office of the U.S. Fish and Wildlife Service issued a letter of concurrence with the Monument's Biological Assessment in completion of Section 7/Endangered Species Act consultation.

Text Changes

1. Page 2, PURPOSE AND NEED section, 5th bullet, Guidance for Implementation of Federal Wildland Fire Management Policy (February 2009) – add “revised January 2013” to the reference.
2. Page 13, PROPOSED ACTION OR PREFERRED ALTERNATIVE section, following sentence “Pile burning, which has been occurring at all three units, would also be considered for mechanical and/or manual hazardous fuels reduction.” Add, “The need to apply herbicides in conjunction with other fire management actions was analyzed in the park's existing “Invasive Management Plan and Environmental Assessment” (2007)
3. Page 18, Table 2. Comparison of Alternatives, under Preferred Alternative, Planned Events: delete “herbicide applications” from the sentence reading “Mechanical and manual fuel reduction treatments and herbicide applications could occur”.

Appendix A – Non-Impairment Finding

The National Park Service's *Management Policies, 2006* require analysis of potential effects to determine whether or not actions will impair NPS resources. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values.

However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within park, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park; or
- Identified as a goal in the park's general management plan or other relevant NPS planning documents.

An impact would be less likely to constitute impairment if it is an unavoidable result of an action necessary to pursue or restore the integrity of park resources or values and it cannot be further mitigated.

The park resources and values that are subject to the no-impairment standard include:

- The park's scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;
- Appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;

- The park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefits and inspiration provided to the American people by the national park system; and
- Any additional attributes encompassed by the specific values and purposes for which the park was established.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. The NPS's threshold for considering whether there could be impairment is based on whether an action will have significant effects.

The impact topics carried forward and analyzed for the NPS selected alternative in the EA, and for which a non-impairment determination was completed include: geology and soils, vegetation, special status species, wildlife, air quality, soundscape, hydrology and water quality, archeological resources, ethnographic resources, historic structures and cultural landscapes.

Fundamental resources and values for the Monument are identified in the 2010 *General Management Plan/Environmental Assessment: Montezuma Castel National Monument and Tuzigoot National Monument*. According to the General Management plan document, the impact topics listed above are considered necessary to fulfill specific purposes identified in the legislative history of the monument, and/or are included in the GMP itself.

Geology and Soils The major rock unit forming cliffs in the Verde Valley is the Verde Formation. This rock type is found at all three park units. Verde Formation is a sedimentary deposit created by an ancient lakebed and consisting of limestone, mudstone and siltstone. Two types of soils are present in the monuments. Upland soils have developed through the decomposition of Verde Formation limestone. Bottomland soils consist of alluvial deposits of silt and sand.

While the selected action will not result in any impacts on geologic resources in the NPS units, the soils may be both adversely and beneficially affected by the selected action. Potential adverse impacts to soils include erosion after wildfire intense enough to remove above and below ground vegetative structure, soil compaction from foot and vehicle traffic, and fire may cause changes in soil chemistry (e.g., loss of nitrogen). Implementing planned fuel reduction and ecosystem restoration/maintenance projects, and responding to wildfires as described in the selected action will pose no risk of impairment to the monuments' geology and soils because impacts would be localized, and short in duration.

Vegetation The dominant upland vegetation community is desert scrub with elements of semi-desert grassland and coniferous woodland. Common species include creosote bush, mariola, velvet mesquite, perennial grasses such as tobosa, and often scattered one-seed juniper, Utah juniper, and crucifixion thorn. The dominant community in the lowlands is riparian woodland/gallery forest, with riparian trees such as the Arizona sycamore, and

Arizona ash and understory species such as the Gooding willow as well as grasses and flowering plants. Tavaschi Marsh vegetation includes emergent such as cattails and bulrush.

Potential impacts to vegetation from the selected action could be both adverse and beneficial. Impacts could include individual plant or groups of plants' mortality during manual/mechanical fuel reduction projects, prescribed burns, herbicide applications, and wildfires. Although individual plants may be perceived as adversely affected, the local population or the ecosystem would benefit from implementation of the selected action, by maintaining historic vegetation density levels, and by reducing fire intensity during wildfires. Implementing planned fuel reduction and ecosystem restoration/maintenance projects, and responding to wildfires as described in the selected action will pose no risk of impairment to the monuments' vegetation, because adverse impacts would be localized, and short in duration.

Special Status Species According to the USFWS and park staff, several special-status species could potentially occur in National Park Service units. These include Razorback Sucker (*Xyrauchen texanus*), Gila Chub (*Gila intermedia*), Loach Minnow (*Tiaroga cobitis*), Spikedace (*Meda fulgida*), Colorado Pikeminnow (*Ptychocheilus lucius*), Roundtail Chub (*Gila robusta*), Southwest Willow Flycatcher (*Empidonax traillii extimus*), Yuma Clapper Rail (*Rallus longirostris yumanensis*), Northern Mexican Gartersnake (*Thamnophis eques megalops*), Page Springsnail (*Pyrgulopsis morrisoni*).

Potential impacts to special status species from the selected action could be adverse and beneficial. Adverse impacts could include temporary degradation of habitat during and immediately after implementation of manual/mechanical fuel reduction projects, prescribed burns, and wildfires. Planned projects like manual/mechanical fuel reduction, prescribed burns, will be designed and implemented to minimize impacts to the special status species. Management responses to wildfire include mitigation measures to reduce adverse impacts like ash and soil in bodies of water, and protecting occupied habitat. Fuel management will have an overall beneficial impact by preventing large scale catastrophic fire in important habitat areas. Implementing planned fuel reduction and ecosystem restoration/maintenance projects, and responding to wildfires as described in the selected action will pose no risk of impairment to special status species located in the monuments, because adverse impacts would be localized, and short in duration.

Wildlife The monuments support a wide variety of wildlife including approximately 50 mammal species, 211 species of birds at Montezuma Castle and 248 species of birds at Tuzigoot along with reptiles and native fish. Montezuma Well has endemic water species including diatoms, springtails, water scorpions, amphipods, and leeches.

Potential impacts to wildlife from the selected action could be adverse and beneficial. Adverse impacts could include implementing mechanical and/or manual hazardous fuel reduction treatments which could temporarily displace wildlife species. All planned fuel reduction projects (prescribed burns, manual/mechanical treatment) will be designed and implemented to minimize impacts to the wildlife. Management responses to wildfire include mitigation measures to reduce adverse impacts like changes in vegetation used as habitat for local wildlife. Fuel management will have an overall beneficial impact by

preventing large scale catastrophic fire; increased plant diversity will be a beneficial result from non-fire and fire fuel reduction projects. Implementing planned fuel reduction and ecosystem restoration/maintenance projects, and responding to wildfires as described in the selected action will pose no risk of impairment to wildlife located in the monuments, because adverse impacts would be localized, and short in duration.

Air Quality Montezuma Castle and Tuzigoot are both class II air quality areas. The selected action involves planned fuel reduction projects intended to reduce the intensity of any wildland fire. Potential impacts to air quality from the selected action could be adverse and beneficial. Prescribed burns and management responses to wildfires will result in increased particulate matter in the monuments, and in local communities. Planned projects like prescribed burns will be designed and implemented to minimize adverse impacts to air quality. Management responses to wildfire would utilize mitigation measures that in an effort to reduce impacts to sensitive receptors. Some very minor beneficial impacts may result from reducing fuels, and suppressing wildland fire. Implementing planned fuel reduction and ecosystem restoration/maintenance projects, and responding to wildfires as described in the selected action will pose no risk of impairment to the monuments' air quality, because adverse impacts would be short in duration.

Soundscapes A natural soundscape is the total of all natural sounds (excluding human-caused sounds) along with the physical capacity for transmitting natural sounds. Natural sounds are within and beyond the range of human perception and can be transmitted through air, water, or solid materials. Visitor experience and reverence for resources are enhanced by the absence of human-caused noise. Lack of noise is also important for wildlife communication, courtship and mating, and effective use of habitat. Planned projects, including prescribed burning, manual and mechanical fuel reduction projects, and response to unplanned fires could add unwanted sound to the natural environment. These adverse impacts would be temporary. Implementing planned fuel reduction and ecosystem restoration/maintenance projects, and responding to wildfires as described in the selected action will pose no risk of impairment to the monuments' soundscape, because adverse impacts would be localized, and short in duration.

Hydrology/Water Quality Montezuma Castle and Montezuma Well protect riparian areas and water resources along Beaver and Wet Beaver Creeks. Tuzigoot National Monument includes the Verde River and Tavasci Marsh. Surface and groundwater resources create and sustain aquatic and riparian ecosystems in the monuments and supported prehistoric and historic land use. These highly productive ecosystems have been greatly reduced in areal extent and complexity in the Southwest by groundwater overdrafts, overgrazing, streambed channelization, road construction, surface water flow alterations, impoundments, mining, and developments.

Potential impacts to the monuments' hydrology and water quality from the selected action could be adverse and beneficial. Impacts could be perceived as adverse in the short-term, but would be long-term beneficial, due to removing vegetation in and around surface water. Maintaining healthy riparian and aquatic vegetation in turn protects water quality by filtering particles, and anchoring sediments on the edges of the surface water. Water quality may initially be reduced due to sediments in the water, but would be temporary.

All planned fuel reduction projects (prescribed burns, manual/mechanical treatment) will be designed and implemented to minimize impacts to the monuments' hydrology values and water quality. Management responses to wildfire include mitigation measures to reduce adverse impacts like introducing ash and sediments into the bodies of water. Fuel management will have an overall beneficial impact by preventing large scale catastrophic fire. Implementing planned fuel reduction and ecosystem restoration/maintenance projects, and responding to wildfires as described in the selected action will pose no risk of impairment to the monuments' hydrology and water quality, because adverse impacts would be localized, and short in duration.

Archeological Resources The entire Montezuma National Monument is an archeological site because it contains artifacts that can continue to yield new information about human habitation. Individually identified archeological sites in both of the Monuments consisting of prehistoric and historic architecture and artifact deposits have been identified, and subsurface deposits, isolated objects and unidentified sites may be present.

Potential impacts to the monuments' archeological resources from the selected action could be adverse and beneficial. Adverse impacts could include implementing mechanical and/or manual hazardous fuel reduction treatments and prescribed burns which could disturb the ground surface, and the heat from fire could degrade the surface artifacts. All planned fuel reduction projects (prescribed burns, manual/mechanical treatment) will be designed and implemented to minimize or remove impacts to the archeological resources. Management responses to wildfire include mitigation measures to reduce adverse impacts like ground disturbing actions including constructing fire lines and establishing spike camps. Fuel management will have an overall beneficial impact by preventing large scale catastrophic fire. Implementing planned fuel reduction and ecosystem restoration/maintenance projects, and responding to wildfires as described in the selected action will pose no risk of impairment to the monuments' archeological resources, because adverse impacts would be minimal by avoiding these resources during planned actions, and by applying mitigation measures during management responses to wildfires.

Ethnographic Resources The monuments' contain ethnographic resources representing plant collection areas, pilgrimage sites and other areas. Project-specific consultation with associated tribes will be completed in order to obtain resource information.

Potential impacts to the monuments' ethnographic resources from the selected action could be adverse and beneficial. Adverse impacts could include implementing mechanical and/or manual hazardous fuel reduction treatments and prescribed burns which could disturb the ground surface, changing the characteristics important to associated tribes. All planned fuel reduction projects (prescribed burns, manual/mechanical treatment) will be designed and implemented to minimize or remove impacts to the ethnographic resources. Management responses to wildfire include mitigation measures to reduce adverse impacts like ground disturbing actions including constructing fire lines and establishing spike camps. Fuel management will have an overall beneficial impact by preventing large scale catastrophic fire. Implementing planned fuel reduction and ecosystem restoration/maintenance projects, and responding to wildfires as described in the selected action will pose no risk of impairment to the monuments' ethnographic resources, because

adverse impacts would be minimal by avoiding these resources during planned actions, and by applying mitigation measures during management responses to wildfires.

Historic Structures The monuments contain historic structures representing Anglo-American ranching, the New Deal Era and Mission 66 periods. Many of these structures are formally listed on the National Register of Historic Places, while others are eligible for listing on the register.

Potential impacts to the monuments' historic structures from the selected action could be adverse and beneficial. Adverse impacts could include implementing prescribed burns and management responses to wildfires which could burn flammable structural material. All planned fuel reduction projects (prescribed burns, manual/mechanical treatment) will be designed and implemented to minimize or remove impacts to the historic structures. Management responses to wildfire include mitigation measures to reduce adverse impacts like protecting structures. Fuel management will have an overall beneficial impact by preventing large scale catastrophic fire, including removal of flammable vegetation adjacent to historic structures. Implementing planned fuel reduction and ecosystem restoration/maintenance projects, and responding to wildfires as described in the selected action will pose no risk of impairment to the monuments' historic structures, because adverse impacts would be minimal by avoiding these resources during planned actions, and by applying mitigation measures during management responses to wildfires.

Cultural Landscapes The monuments include identified and potentially eligible cultural landscapes representing prehistoric and historic period occupations. Landscapes can include vegetation, rock work and earthworks, view sheds, and built features.

Potential impacts to the monuments' cultural landscapes from the selected action could be adverse and beneficial. Adverse impacts could include implementing mechanical and/or manual hazardous fuel reduction treatments and prescribed burns which could disturb the ground surface, alter vegetation, or change viewsheds. All planned fuel reduction projects (prescribed burns, manual/mechanical treatment) will be designed and implemented to minimize or remove impacts to the cultural landscapes. Management responses to wildfire include mitigation measures to reduce adverse impacts like ground disturbing actions, and changes in the contributing vegetation. Fuel management will have an overall beneficial impact by preventing large scale catastrophic fire. Implementing planned fuel reduction and ecosystem restoration/maintenance projects, and responding to wildfires as described in the selected action will pose no risk of impairment to the monuments' cultural landscapes, because adverse impacts would be minimal by avoiding these resources during planned actions, and by applying mitigation measures during management responses to wildfires.

In conclusion, as guided by this analysis, good science and scholarship, advice from subject matter experts and others who have relevant knowledge and experience, and the results of public involvement activities, it is the Superintendent's professional judgment that there will be no impairment of park resources and values from implementation of the selected action.