

Natural and Cultural Resources Management Plan
Tuzigoot National Monument

June 1991 Revision

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INTRODUCTION

Legislation

Tuzigoot National Monument lies at the upper end of the Verde Valley in Yavapai County, Arizona, near the towns of Clarkdale and Cottonwood. It is about 90 miles north of Phoenix, located one mile east of State Highway 89a (See Figure 1). The monument was established in 1939 on 43 acres situated on a limestone ridge rising 100 feet above the Verde River floodplain. An additional 15 acres were added in 1966 as right-of-way for the construction of a new approach road over the river. The monument is centrally located in the state and is within the third Congressional District.

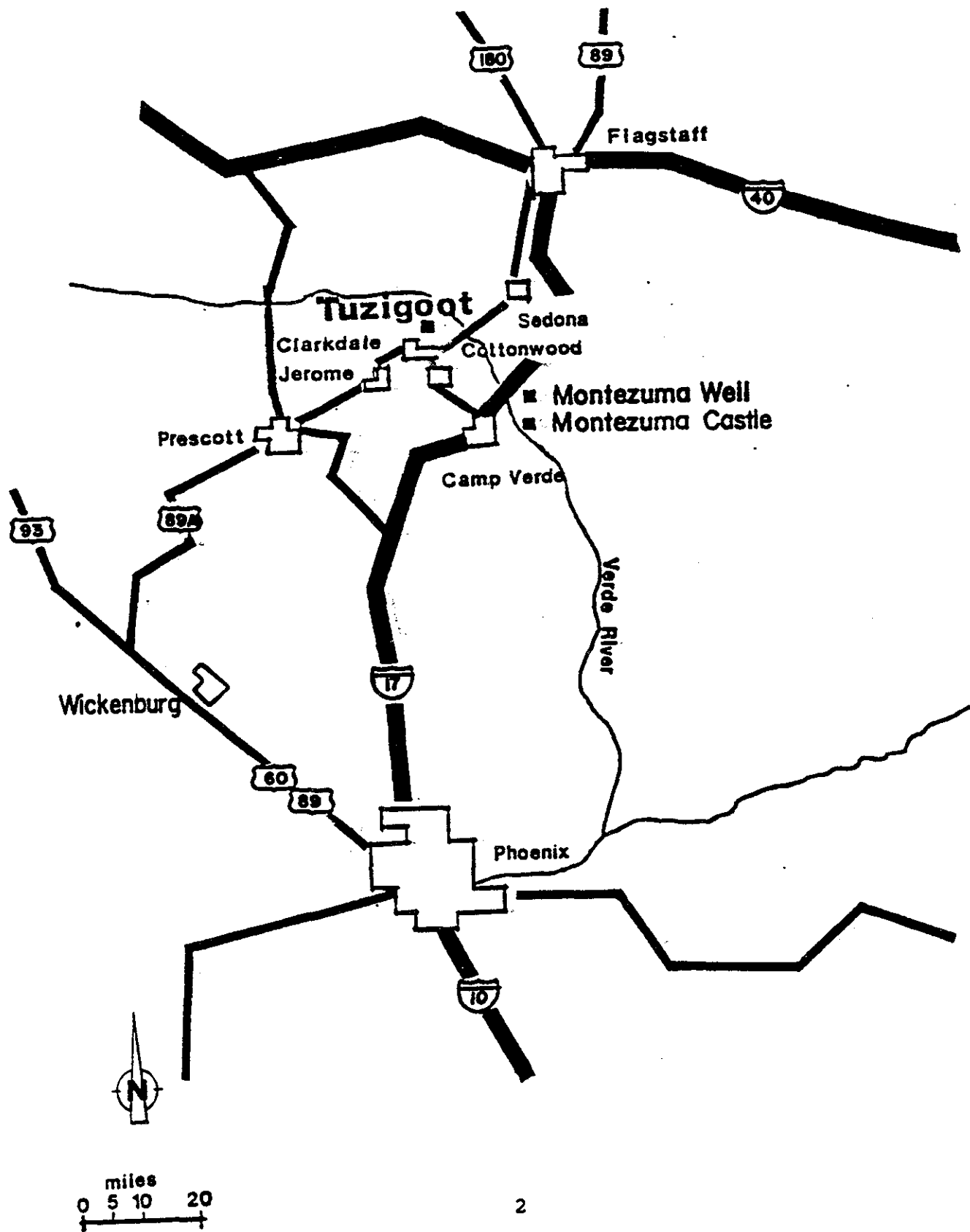
Tuzigoot was established by Presidential Proclamation on July 25, 1939. The Proclamation states that "...certain Government-owned lands in the State of Arizona have situated thereon historic and prehistoric structures and other objects of historic or scientific interest, and ...it would be in the public interest to reserve such lands as a national monument to be known as Tuzigoot National Monument." The 15 acre donation easement was added to the monument in December 1965 for the entrance road. The Approach Roads Act of January 31, 1931, was the vesting power for this addition. Public Law 95-625 (March 1978) expanded the boundary of the Monument by approximately 791 acres. The legislation established an acquisition ceiling of \$1,350,000 and authorized the acquisition of lands within the boundary through purchase, donation or exchange of other lands administered by the Secretary of the Interior in the State of Arizona.

Tuzigoot National Monument is a Registered Historic Landmark and is listed on the National Register of Historic Places. Two buildings are also on the List of Classified Structures. Management must comply with 36 CFR Part 800, "Procedures for the Protection of Historic and Cultural Properties" of the Advisory Council on Historic Preservation, and Guideline NPS-28: Cultural Resources Management.

Most of the land within the expanded boundary is within private ownership. Even though the boundary increase was legislated in 1978, the National Park Service has not acquired any of the property, which comprises two inholdings in separate ownerships.

One inholding consists of 47.74 acres of Verde River frontage owned by Arizona State Parks, and the second consists of 703.88 acres of land owned by Phelps Dodge Corporation. The latter property includes Verde River frontage, a marsh (Tavasci Marsh), an irrigated pasture, and a mine tailings dump. Several preliminary discussions have been held with Phelps Dodge about acquiring or cooperatively managing these inholdings.

Figure 1. Location of Tuzigoot relative to Phoenix and Flagstaff, Arizona.



Tavasci Marsh, owned by Phelps Dodge Corporation, not only represents a unique ecotype within the Verde Valley but also represents one of the few marsh habitats left in Arizona. It occupies an area of about 35 acres and receives water from several springs and drainage from Pecks Lake. The marsh supports a luxuriant growth of cattails often over six feet tall and provides seasonal habitat and nesting ground for several species of waterfowl. Willows and cottonwoods are found around the springs.

While preserving the cultural resources was the impetus to create Tuzigoot, the importance of the natural setting was recognized as an integral part of the life of the prehistoric and historic peoples. The expansion designated in the public law would encompass farming land and a marsh used by earlier people. The early people were attracted to the natural communities in the riparian area and adjacent uplands. The water, flora, and fauna resources created a productive environment for farming, gathering, and hunting. Maintaining the natural environment is crucial to the cultural setting of the monument.

Cultural and Historical Background

Tuzigoot National Monument contains the ruins for one of the largest known pueblos (110 rooms) built by the Sinagua Indians during the period 1100 - 1450 AD. The pueblo probably housed several hundred occupants who farmed in the floodplain below and hunted in the surrounding area. Within sight of Tuzigoot are the ruins of six other pueblos that give some indication of the concentration of population in the Verde Valley during this period. Also within sight of Tuzigoot is other evidence of human occupation of the Verde Valley, including relics of the copper mining town of Jerome, and modern farms and towns.

The occupants of Tuzigoot developed a strong irrigation-based horticultural economy, drawing on technological advances adopted from the Hohokam to the south and the Sinagua to the north. By AD 1300, the Verde River supported a hierarchical system of villages and population centers, integrated by exchange and seasonal interaction. This exchange network extended from the Mogollon Rim to the Sonoran Desert and beyond.

Shortly after abandonment of the Verde Valley by the Sinagua, groups of foragers and hunters reappeared. Around 1500 A.D., the Yavapai occupied the valley and the Apache lived in the mountains to the east. They, too, were farmers, hunters, and foragers.

In 1582, an expedition led by Spanish explorer Antonia de Espejo left the Hopi mesas on the trail to the copper mines. When in the Verde Valley, they found a group of Yavapai mining and trading the green and blue pigments (near the present town of

Jerome). In 1598, 1604, and 1776, other Spanish explorers and padres visited the valley and wrote about the inhabitants and their cultural and economic systems.

The earliest Anglo explorers and trappers used the Verde as a trail stop for many years, but not until the 1850s and 1860s did settlers begin to stay in the valley. The Yavapai were placed under military control in 1875 and moved to the San Carlos reservation. In 1900 they were returned to the valley at the Camp Verde reservation.

Tuzigoot has become an increasingly well known and popular park unit in recent years. This, coupled with efforts by the state to enhance tourism in Arizona, has led to significant increases in visitation. Below are figures that show visitation changes for the past ten years:

<u>Year</u>	<u>Visitation</u>
1978	71,755
1988	113,670

Natural Environment

The 1975 Master Plan and 1990 Statement for Management both state that the purpose of Tuzigoot National Monument is to provide for the protection, preservation, and enjoyment by the public of a prehistoric Indian pueblo. While preservation of cultural resources was the impetus to create the monument, the importance of the natural setting is recognized as an integral part in the life of prehistoric and historic peoples. The early residents were attracted to the natural resource communities in the riparian and marsh areas and adjacent uplands. The water, flora, and fauna resources created a productive environment for farming, gathering, and hunting. The geological formations, sculpted by erosion, provided the materials to build houses and support structures. Maintaining the natural environment is crucial to the cultural setting of the monument.

The climate is semiarid with mild winters and hot summers. Annual precipitation averages 11 inches.

The geology of the Verde River Valley is a long depression sunk by earthquake actions along several faults below the level of the Coconino Plateau. The middle Verde flows through a broad valley approximately 35 miles long. About 10 million years ago, large scale volcanic activity blocked the river's outlet and formed a huge lake. Deposition of sandstone and limestone on the lake bottom continued for thousands of years until the river cut a new

outlet and exposed the broad middle Verde Valley. This area is topographically diverse with terrain including valleys, mesas, canyons, plateaus, and peaks.

Increased land and water use patterns in the Verde Valley indicate that water rights, water quality, aquifer protection, floodplain regulation, instream mining, instream flow, riparian habitats, wildlife and endangered species are among the concerns to park management. A water resources management plan is being prepared to identify and help address problems such as those listed below.

Surface and ground water resources create and sustain aquatic and riparian ecosystems in the monuments and supported prehistoric and historic land occupation and uses. Riparian and aquatic environments have become increasingly important in the arid southwest due to widespread destruction and/or significant alteration. They are highly productive ecosystems that have been greatly reduced in areal extent and complexity by ground water overdrafts, overgrazing, streambed channelization, surface water flow alterations, impoundments, mining, and developments. These uses often conflict with protection and preservation of natural and cultural resources.

The importance of groundwater in the area is significant. About half the flow of the Verde River leaving the valley is due to groundwater discharge into the river and its tributaries. Most occurs as non-point discharge into streams along their courses. Another portion results from springs, such as Shea Springs in Tavasci Marsh, which discharges an unknown quantity. Adjacent land uses pose a threat to groundwater in the monument. Rapid urbanization in the Verde Valley has led to increased number of wells drilled for water supplies. The population of the locality is predicted to increase substantially.

Water rights to groundwater are currently being adjudicated. The NPS claims for the monument are for "ground water resources for both domestic use and fire protection."

Lack of data about the biological resources is a critical resources problem. The few studies and inventories done provide some information to manage resources, but much more is needed for comprehensive understanding of the environment and inter-relationships.

The juxtaposition of upland and lowland habitats dissected by floodplains produce unique and diverse biological communities. This area is one of the most significant bioregions of Arizona. Four plant associations occur in the monument and include the snakeweed-honey mesquite association, creosote bush-crucifixion thorn association, mixed deciduous association, and honey mesquite association.

The diversity of aquatic and terrestrial species in the habitats are also notable. Birds are the most commonly observed wildlife, and breeding densities in relatively undisturbed riparian habitats along the marsh are reported as being among the highest recorded from North America. Other fauna passing through or living on the monument include coyote, fox, bat, bobcat, mountain lion, ground squirrels, and other common rodents. Reptiles include several snakes and lizards.

A few sensitive species are found in the monument or have potential habitat. They include the Arizona cliffrose (endangered) for which habitat exists, and the southern bald eagle (endangered) nests in the area. Some endangered fish species, the razorback sucker and Colorado squawfish have been reintroduced into the Verde River. The endangered spikedace occurs in part of the Verde River.

Management Objectives

The management objectives regarding cultural and natural resources for Tuzigoot are listed below:

- Preserve and protect prehistoric and historic structures and objects.
- Manage the collection of cultural objects so they do not deteriorate.
- Preserve and protect water resources.
- Cooperate and plan with government agencies and community groups to protect the integrity of the cultural and natural environment within and surrounding the monument.
- Preserve the ecological processes of the abiotic resources and biotic components in a manner to perpetuate native species and suppress alien species.
- Preserve the cultural and natural landscape.
- Maintain natural resources, when appropriate, as they appeared to the first European explorers.
- Gather data through research programs and other studies in archeology, history, natural science, visitor use, and land use for information pertinent to managing and interpreting resources in the Monument.
- Monitor cultural and natural resources.

- Determine visitor characteristics, impacts, and carrying capacity.
- Manage developed zones in order to allow use with the least possible human impact on cultural and natural areas.

This Natural and Cultural Resources Management Plan is a revision of the original 1975 plan, including environmental assessment, and the subsequent updates in 1981, 1984, 1985, and 1987. In developing this current plan, an interdisciplinary approach was used with a team of cultural and natural resources managers and scientists. As a result, the program was enhanced. There was an increase from seven projects in the original plan to over 50 resources projects in this one.

This plan, as with the previous documents, guides the resources management program at Tuzigoot National Monument in accordance with the above mentioned objectives. Through the plan, resource issues are identified and actions are proposed to deal with problems and threats or else to conduct research in order to gather information for management.

This Resources Management Plan (like its predecessors) was prepared in conjunction with other park documents in order to be consistent with the purpose for establishment and with operational plans. It also complies with environmental and cultural legislation.

PRESENT RESOURCE STATUS

Natural Resource Baseline Information

The National Park Service is currently developing Servicewide "Standards for Natural Resources Inventory and Monitoring" which, when available, will be helpful in more uniformly describing information in this section. In the meantime, the status of Tuzigoot National Monument's resource information base is thoroughly inadequate for the job at hand. The major focus of the natural resources section of this Resources Management Plan is the development of an adequate baseline data base for the monument.

Some baseline information does exist for Tuzigoot, but the level of information in past and current studies is simply inadequate to gather complete knowledge of resources to guide proper management over the long run. Consequently, most of the natural resources project statements listed within this Natural and Cultural Resources Management Plan are designed to provide baseline data for the monument.

Currently, the natural resources data base is comprised of the following information:

1. A partial plant list resulted from an archeological survey conducted in 1986.
2. A complete bird checklist was prepared in 1980.
3. Low level air photographs were taken of the unit at a scale of 1" = 200'. These have proven invaluable for discussions, presentations, planning, and illustration of park concerns.
4. A vegetation study was contracted for the entire monument to do vegetation inventory, classification, and mapping in 1987. Permanent plots were established for long-term monitoring, and historic photos were retaken. The report included impacts and changes of vegetation communities due to human influences, such as grazing, fire, agriculture, and visitation.
5. In preparation for writing a water resources plan, a contract was let to gather information about water resources for the monument. It summarized historical data and research as well as identified water resources related issues. The report will be combined with project statements to form the final water resources plan.

Natural Resources

The natural environment in this rich riparian area and adjacent uplands provided shelter and sustenance as well as an aesthetic setting for the Sinagua and Hohokam people. Because the geological forms and biotic components are integral features of the cultural resources, the monument is dedicated to maintaining the landscape that attracted the early residents. To that end, it is essential to protect and preserve the ecological processes that created the cultural setting.

Some human activities threaten the natural resources. These are briefly discussed below and are the subject of several project statements.

The three most serious threats facing the monument are:

Lack of basic resource data--There is an insufficient understanding of park ecosystems and threats to them, as noted in the previous section on natural resources baseline information. This makes it difficult to properly assess the condition of resources or identify threats. In a very real sense, this lack of data represents a threat of its own. It renders it difficult for the superintendent to make well reasoned decisions on how to properly manage the resources.

Adjacent land uses--Increasing development on adjacent and surrounding lands, i.e., mining, feral animals, woodcutting, highway, a bisecting dirt through-road, subdivisions and associated developments, water demands, pesticide and fertilizer use draining into water resources, and visual intrusions to the cultural and natural setting all result in direct and indirect impacts to the monument resources.

Surface water diminution--Uncertain water rights, human-caused alterations in spring flows, and draining the marsh affect water resources. Water quality from Peck's Lake is affected by pesticide and fertilizer uses on the golf course. The future uses of Peck's Lake and the Verde River are questionable regarding diversion, quality, etc.

Other important issues facing the monument include:

Stream channel alteration--Alteration includes down cutting or deposition of the channel, flooding, or change of flow regime, which result from gravel mining, diversion, vegetation changes, or other human manipulation.

Non-native species invasion--Non-native plant and animal species accompanying human occupation have invaded the Monument with varying degrees of impact to native fauna and flora as well as the visiting public and employees.

Water pollution--Pollution deteriorates water quality and results from urbanization, other development, sewage disposal, irrigation (pesticides and fertilization), mining, and grazing.

Exceeding Visitor Carrying Capacity--Enhanced notoriety and popularity is resulting in increased visitation. The physical and social human impacts due to increased visitation cause a strain on the natural and cultural resources, facilities, and quality of the visit.

Cultural Resource Baseline Information

Baseline information for the monument is lacking in a number of areas. A list of these deficiencies is as follows: 1) cataloging of backlogged museum objects for basic federal property accountability; 2) analysis of records and objects from the site which are associated with the 1930's excavation and subsequent stabilization efforts; 3) Historic and Prehistoric Structures Preservation Guides; 4) an updated administrative history; 5) inclusion of previous studies in the Cultural Resource Management Bibliography (CRIB); 6) updating of the List of Classified Structures (LCS); 7) National Register of Historic

Places nomination forms for two structures of historic-architectural significance; and 8) entry of sites into the Cultural Sites Inventory (CSI) once the standards have been established.

The following sections of this plan provide more specific details on cultural resource needs for Tuzigoot National Monument: 1) project statements, which provide additional information on needed actions; 2) Appendix 2, Cultural Resources Documentation Checklist, which provides a summary of completed cultural resources related studies in the monument; and 3) Appendix 4, Bibliography, which contains a list of references to projects and studies conducted in the monument.

Cultural Resources

Sites. The sites at Tuzigoot National Monument are of national significance and include the primary site under the main ruin. An archeological survey in 1986 updated to current standards all information on the previously recorded sites. The USFS is also updating their archeological study of the Verde Valley, and will include the new Tuzigoot data in their report.

An archeological analysis of the Tuzigoot records and artifacts is needed which would include a major effort to locate data and artifacts from Tuzigoot prior to Service acquisition of the area in 1939. The effort will address and reflect the advances made in archeology in the last 49+ years.

The prehistoric setting and land use associated with Tuzigoot are endangered and being altered by current land use. Acquisition, restoration and interpretation of the lands is indicated.

The current Tuzigoot lands have a 100% survey for cultural resources.

Structures. There is one major prehistoric structure in Tuzigoot National Monument at the National Level of significance. It is the primary resource for which the area was established. This prehistoric structure has a low impact resulting primarily from weather and visitation.

There are two remaining historic structures in the area which have not yet gone on the register and have undetermined significance. These two structures, the masonry museum and headquarters building and a masonry tool storage shed, are in good condition with a low impact level from occupants. However, the preservation of the structures is becoming more complicated as the materials of construction are beginning to show signs of age. Guidance for the preservation maintenance for these historic buildings is now required.

Tuzigoot has been completely surveyed for potential register structures. The List of Classified Structures represents a complete inventory of structures that are either on the National Register or which the Western Regional Office considers eligible for the National Register.

Objects. The Tuzigoot National Monument collections are comprised of primarily archeological material recovered from excavation of the Tuzigoot ruins. These collections, most of which were excavated in 1937, under a variety of federal projects, are either on exhibit in the park museum (about 500 items) or stored and curated at the Museum Collections Repository, Western Archeological and Conservation Center (MCR - WACC), Tucson, Arizona. There are a small number of other types of objects in the collection including ethnographic, historic, and biological (please refer to the Summary Chart for Objects for exact numbers).

The MCR - WACC is responsible for cataloging the relatively small backlog of uncatalogued material (341 items), primarily archeological in nature. They expect to complete the cataloging this fiscal year. Basically the collections are in good condition with little impacts to them. The Tuzigoot museum is in need of a climate control system to maintain environment to NPS standards. The park acquires items at a very slow rate; the last acquisitions were in 1985 (148 items in 12 accessions). The park has not been creating more backlog.

Cultural Context/Theme

Tuzigoot National Monument preserves archeological sites and features representing Hohokam and Sinagua settlement in the Middle Verde drainage from AD 600 to AD 1450. During this span of time, a native hunting/gathering population developed a strong irrigation-based horticultural economy, drawing on technological advances taken from the Hohokam from the south and the Sinagua from the north. By AD 1300, the Verde River supported a hierarchical system of villages, and population centers, integrated by exchange and seasonal interaction. This exchange network extended from the Mogollon Rim to the Sonoran Desert and beyond. Within the settlement chain, Tuzigoot was a major population center. Because of the archeological attention it has received, Tuzigoot is one of the best-documented sites architecturally. The Tuzigoot collection is the largest artifact assemblage for this cultural phase.

In the thematic analysis, History and Prehistory in the National Park System and the National Historic Landmarks Program (1987), Tuzigoot represents:

- I. THE ORIGINAL INHABITANTS (Theme)
- B. Native Villages and Communities (Sub-theme)
- 1. Southwestern United States (Facet)

In the period 1916-1942 there developed in the western parks a style of architecture employing native materials to blend the structure into the environment which has been referred to as "rustic architecture", "Parkitecture" or "Architecture in the Parks". Rustic is a style which, through the use of native materials (in the particular park or area of the park) in proper scale, and through the avoidance of rigid straight lines and over-sophistication, gives the feeling of having been executed by pioneer craftsmen with limited hand tools. It thus achieves sympathy with natural surroundings, and with the past.

At Tuzigoot National Monument, the Visitor Center (building one) and Garage (building two) constructed in the stone Pueblo style of rustic architecture in 1936 are excellent examples. The structures are on the List of Classified Structures and have been identified in previous surveys as meeting the National Register Criteria.

In the thematic analysis, History and Prehistory in the National Park System and the National Historic Landmarks Program (1987), Tuzigoot represents:

- VII. AMERICA AT WORK (Theme)
- E. Architecture (Sub-theme)
- 6. Other Specialized-Rustic (Facet)

NATURAL AND CULTURAL RESOURCES MANAGEMENT PROGRAM

Overview of Current Program and Needs

Since Tuzigoot has a complete archeological inventory, and interpretation will continue to focus on the same sites and objects now on exhibit, the primary cultural resource program needs are to maintain these objects and sites. In addition, collection and assessment of existing records and data is needed to provide background for management and interpretation of the archeology and history of the monument.

There is a continuous need to stabilize the sites on exhibit at Tuzigoot. Although the main ruin is in excellent preservation, its condition still requires periodic monitoring. An important source of data on the condition of the ruin as it has appeared over the last century is historic photographs, many of which are in private collections or institutions; an inventory of these photographs is needed (C-15). It is important that a specialist in historic structure maintenance inspect the ruins at regular

intervals, prepare historic preservation guides, and establish a regular schedule for stabilization and repair (See project statements I-01, C-07, C-13, C-14, and C-16).

The monument has a significant and very valuable collection of artifacts on display, which interpret both prehistoric and historic Native American cultures of the area. These are presently in exhibit cases that cannot be continuously monitored, and which could be easily burglarized. New security measures are required for their protection (C-18). The fluctuation of temperature and humidity in the existing visitor center has real potential for harm to some unique artifacts made from organic material, and needs to be controlled by modification or replacement of the existing exhibit space (C-02 and C-09). In addition to the approximately 140 items at the monument, the Western Archeological and Conservation Center stores over 5000 artifacts from the monument. Planning storage, treatment and security of these objects requires a Collection Management Plan (C-12). Since Tuzigoot was excavated by archeologists and amateurs prior to establishment of the monument, there are probably more objects in private and institutional collections than there are stored by the Service. The location and extent of the collections have never been determined; a survey and inventory of them would provide valuable data for future research and interpretation (C-05).

Site records, reference bibliography and interpretive context for the prehistoric and ethnographic resources of the monument have been periodically revised, but need to be updated for ready use in interpretation, management and research. An archeological overview and annotated bibliography were prepared in 1977; since then research on the Sinagua and Hohokam has been accomplished within the monument and in nearby areas, which can add to interpretation. These should be incorporated in a revised bibliography (C-11).

Some historic research can contribute to management of the monument's cultural resources. The last administrative history was written in 1965; documenting activities at the monument since then in an Administrative History (C-10) would provide general historical data for present and future managers. An Historic Structure Preservation Guide should also be prepared for the museum and headquarters building and the tool storage house (C-13), following which a systematic program of structures maintenance should be carried out (C-16).

Tuzigoot has a small staff, with no single position having full-time responsibility for either cultural or natural resources planning or protection. Current staffing levels are sufficient to allow for the continuance of minimum levels of natural

resource protection through such activities as pest management (I-02), tree hazard removal and other vegetation management activities (N-01), and program administration (I-01).

Cultural resources management being conducted with current staffing levels includes such activities as conserving museum objects (C-01), museum collection management (C-02), maintaining ANCS program (C-03), and program administration (I-01). These activities are routinely carried out on a recurring basis to protect cultural resources from depreciative activities.

Tuzigoot receives cyclical preservation assistance from the Ruins Preservation Specialist of the Southern Arizona Group Office. The Western Archeological and Conservation Center provides assistance in curation of museum objects and assistance in archeological site management. The Cooperative Park Studies Unit at the University of Arizona provides assistance with natural resources research issues. The Southern Arizona Group Office provides natural resources management and planning assistance. Almost all of this assistance, however, is predicated on project specific funding rather than on base funded activities.

Only one of the major threats to the monument's natural resources is currently being addressed (adjacent land use), due to a lack of adequate staffing and associated project funds. Similar restrictions inhibit the cultural resource management efforts in the monument.

The breadth and complexity of the cultural and natural resource issues at Tuzigoot and Montezuma Castle National Monuments demand the attention of a professional resource manager. A full-time resources management specialist could be shared between the two monuments. This position has been outlined as project statement MOCA-I-03 in the Montezuma Castle National Monument Resources Management Plan and will not be repeated here. In addition, at least \$40,000 per year in project support funds is needed by Tuzigoot National Monument to carry out the baseline research and management activities listed in this plan within a reasonable period to time. Even with funding of \$40,000 per year, it would take Tuzigoot ten years to complete four of their top five natural resource projects (out of 18 unfunded natural projects identified to date) and four of their top cultural resource projects (out of 19 unfunded cultural projects identified to date). This excludes the acquisition and restoration of Tavasci Marsh and other culturally significant lands needed to preserve a more complete picture of the prehistoric scene in the Tuzigoot area (projects C-04 and N-03).

An indication of the resource funding shortage at the monument is provided by the fact that the total project funding for both cultural and natural resources programs in the last 5 years at Tuzigoot has been only about \$29,000. This funding has come

entirely from cultural cyclic maintenance and natural resource regionbase funding. Increased base funding is needed by the monument to adequately do the job at hand.

When funding becomes available the monument will undertake the following long-term strategies to address the major resource threats to the monument's natural resources outlined in the Present Resource Status section of this plan:

Lack of basic resource data--An interdisciplinary team of experts was convened in July 1988 to identify the range of resource components that need to be studied. The interdisciplinary group recommended that the selected components be inventoried, the status of each component be assessed, a long-term monitoring protocol be developed to track health of the ecosystem over time, the monument staff be trained to use the monitoring protocol, and that long-term monitoring be conducted by the monument staff. Once a series of these inventory and assessment projects have been completed it will be necessary to integrate the individual protocols into a unified long-term monitoring program for the monument.

Further, it was recommended that the monument use a Geographic Information System (GIS) to manage the inventory and monitoring data (I-07). The GIS themes should be developed prior to the inventory and assessment projects to ensure that all data is gathered in a format compatible with GIS requirements and consistent with anticipated analysis needs. The actual digitization of data and any purchase of GIS hardware can occur at a later date, as needed.

These recommendations have been developed into a series of project statements in the following priority order:

- N-02 Identify and Inventory Water-Related Resource Attributes
- N-05 Conduct Riparian and Wetland Ecosystem Research
- N-06 Delineate and Evaluate Strategies for Wetlands Protection
- N-08 Conduct Inventory & Assessment: Vegetation & Flora
- N-09 Conduct Assessment of Rare and Endemic Species
- N-11 Conduct Inventory & Assessment: Birds
- N-12 Conduct Inventory & Assessment: Invertebrates
- N-13 Conduct Inventory & Assessment: Non-native Species
- N-14 Conduct Inventory & Assessment: Amphibians and Reptiles
- N-15 Conduct Inventory & Assessment: Mammals
- N-16 Conduct Inventory & Assessment: Soils
- I-03 Develop Bibliographic Assessment & Computer Retrieval System
- I-06 Establish Program for Long-Term Monitoring of Natural and Cultural Setting
- I-07 Develop Geographic Information System

Groundwater withdrawal--Experts from the National Park Service Water Resources Division (WRD) met with the interdisciplinary team mentioned above and helped develop a strategy for protecting the monument's groundwater resources. First, a broad-based inventory of water-related resource attributes throughout the monument will be conducted (N-02), followed by the conduct of riparian and wetland ecosystems research (N-05) and the delineation and evaluation of strategies for wetlands protection (N-06). These projects, in conjunction with the associated long-term monitoring, will enable the monument to better understand the consequences of additional groundwater withdrawal in the area and to work effectively with other agencies, groups, and individuals to minimize adverse impacts on monument resources.

Alteration of flow regimes--The National Park Service Water Resources Division staff also assisted in developing a strategy for protecting monument resources from altered flow regimes. Again, the initial step will be the broad inventory of water-related resource attributes throughout the monument (N-02). Next, more intensive research will be conducted to better understand the monument's riparian and wetland ecosystem (N-05), followed by the delineation and evaluation of strategies for wetlands protection (N-06). Again, these projects, in conjunction with the associated long-term monitoring, will enable the monument to better understand the impact of the alteration of flow regimes and to work effectively with other agencies, groups, and individuals to minimize adverse impacts on monument resources.

Adjacent land use--An effort is currently underway (N-04) to identify the issues, concerns, and opportunities presented by rapid changes in adjacent land use; analyze the management situation and assess the risk level associated with these land use changes; develop a monitoring protocol to track changes; and train monument staff to conduct the monitoring. A project statement has also been prepared to restore Tavaschi Marsh from the effects of past grazing impacts (N-03). Once again, these projects will prepare monument staff to work effectively with others to minimize any adverse impacts of adjacent land use on monument resources.

The other important natural resource issues identified in the Present Resource Status section will be addressed by the following project statements as funding becomes available:

Visitor use impacts:

TUZI-N-07 Conduct Visitor Use Survey
TUZI-I-05 Determine Visitor Impacts and Use Limits

Non-native species invasion:

TUZI-N-13 Conduct Inventory and Assessment: Non-native Species

Vegetation management:

TUZI-N-01 Manage Vegetation: Rehab, Landscaping, & Tree Hazard
Removal

Management of prehistoric fields:

TUZI-I-04 Investigate Oldfield Vegetation Dynamics

Tables 1 and 2 show the levels of funding and personnel currently available for cultural and natural resources management activities in the monument.

TABLE 1
 NPS RESOURCES PERSONNEL
 (current year only)

FY: 91
 PARK: TUZI
 REGION: WR

TYPE OF NPS EMPLOYEE		FTE's of RESOURCES WORK			
		Natural	Cultural	Total	
RESEARCH SCIENTISTS (i.e., Research Grade Evaluation and Research Grant Administration Programs)		0	0	0	
RESOURCES SPECIALISTS (i.e. 170, 190, 193, 401, 404, 430, 808, 1015, 1016, 1215, etc.)		0	0	0	
025 PARK RANGERS - Resource Management		0.11	0.38	0.49	
025 PARK RANGERS - Resource Protection		0	0	0	
025 PARK RANGERS - Resource Interpretation		0	0	0	
MAINTENANCE PERSONNEL		0	0	0	
TOTALS OF ALL RESOURCES PERSONNEL		0.11	0.38	0.49	
TOTAL PARK FTE (ALL PERSONNEL)	4	PERCENTAGE OF PARK FTE DEVOTED TO RESOURCES	2.8%	9.5%	12.3%

TABLE 2
 CURRENT YEAR NATURAL AND CULTURAL RESOURCES FUNDING
 (\$ in thousands - funding by activity type)

FY: 91
 PARK: TUZI
 REGION: WR

FUNDING SOURCE	TOTAL	RESEARCH/ DOCUMENTATION	MITIGATION/TREATMENT	MONITORING	PROTECTION	INTERPRETATION	PROGRAM ADMIN/TRAINING
CF2	\$7.3	\$1.4	\$5.9	0	0	0	0
NF2	\$10.0	0	\$7.0	0	0	0	\$3.0
NF3	\$5.7	\$5.7	0	0	0	0	0
ALL SOURCES	\$23.0	\$7.1	\$12.9	0	0	0	\$3.0

Natural, Cultural, and Integrated Resources Projects Programming
Sheets

The following tables show the currently funded and ongoing natural and cultural resources projects in the monument, as well as priority listings of unfunded needs for both subject areas.

PROGRAMMING SHEET 1
 CURRENT YEAR FUNDED NATURAL RESOURCES ACTIVITIES
 (\$ in thousands)

FY: 91
 Park: TUZI
 Region: WESTERN

PROJ STMT NUM	PROJECT OR ACTIVITY TITLE	PKG NUM	CULT RES TYPE	SERVICE- WIDE ISSUE(S)	FUNDING SOURCE	ACT TYPE	CURRENT YEAR		OUTYEAR 1		OUTYEAR 2		OUTYEAR 3		TOTAL	
							\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE
N-01	Manage Vegetation: Rehab- ilitation, Landscaping, and Hazard Tree Removal	N/A	N/A	N24	NF2	MIT	1.0	0.05	1.0	0.05	1.0	0.05	1.0	0.05	4.0	0.2
N-04	Analyze Adjacent Land Use and Status	N/A	N/A	N16	NF3	RES	0.0*	0.00	6.2	0.00	0.0	0.00	0.0	0.00	6.2	0.0
TOTAL FOR ALL FUNDED NATURAL RESOURCES ACTIVITIES							1.0	0.05	7.2	0.05	1.0	0.05	1.0	0.05	10.2	0.2

* The first two years of Project N-04 were funded with FY90 monies; the remaining year will be funded with FY92 funds.

PROGRAMMING SHEET 2
 UNFUNDED NATURAL RESOURCES ACTIVITIES
 (\$ in thousands)

FY: 91
 Park: TUZI
 Region: WESTERN

PK PRI NUM	PROJ STATM NUM	PROJECT OR ACTIVITY TITLE	PKG NUM	CULT RES TYPE	SERVICE- WIDE ISSUE(S)	FUNDING SOURCE	ACT TYPE	STARTING YEAR		OUTYEAR 1		OUTYEAR 2		OUTYEAR 3		TOTAL	
								\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE
1	N-02	Identify and Inventory Water related Resource Attributes	N/A	N/A	N20	NF8	RES	25.0	0	25.0	0	25.0	0	0	0	75.0	0
2	N-03	Restore Tavasci Marsh	N/A	N/A	N12	NF3	RES	59.0	0.8	48.0	0.6	33.0	0.6	0	0	140.0	2.0
3	N-05	Conduct Riparian and Wetland Ecosystem Research	N/A	N/A	N20	NF3	RES	15.5	0.6	15.5	0.6	17.0	0.6	18.0	0.6	66.0	2.4
4	N-06	Delineate and Evaluate Strategies for Wetland Protection	N/A	N/A	N16	NF6	RES	20.0	0	30.0	0	33.0	0	0	0	83.0	0
5	N-07	Conduct Visitor Use Survey	N/A	N/A	N24	NF3	RES	11.8	0.5	0	0	0	0	0	0	11.8	0.5
6	I-04	Investigate Oldfield Vegetation Dynamics	N/A	N/A	N08	NF3	RES	15.0	0.6	0	0	0	0	0	0	15.0	0.6
7	I-05	Determine Visitor Impacts and Use Limits	N/A	N/A	N22	NF3	RES	15.5	0.7	12.0	0.5	0	0	0	0	27.5	1.2
8	N-08	Conduct Inventory and Assessment: Vegetation and Flora	N/A	N/A	N20	NF3	RES	7.5	0.3	8.0	0.3	8.0	0.3	0	0	23.5	0.9
9	N-09	Conduct Assessment of Rare and Endangered Species	N/A	N/A	N20	NF3	RES	15.8	0.6	0	0	0	0	0	0	15.8	0.6

PROGRAMMING SHEET 2
 UNFUNDED NATURAL RESOURCES ACTIVITIES
 (\$ in thousands)

FY: 91
 Park: TUZI
 Region: WESTERN

PK PRI NUM	PROJ STATH NUM	PROJECT OR ACTIVITY TITLE	PKG NUM	CULT RES TYPE	SERVICE- WIDE ISSUE(S)	FUNDING SOURCE	ACT TYPE	STARTING YEAR		OUTYEAR 1		OUTYEAR 2		OUTYEAR 3		TOTAL		
								\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE	
10	N-10	Construct Boundary Fence	N/A	N/A	N19	NF3	MIT	70.0	0	0	0	0	0	0	0	0	70.0	0
11	N-11	Conduct Inventory and Assessment: Birds	N/A	N/A	N20	NF3	RES	8.0	0.25	7.4	0.25	8.7	0.25	0	0	0	24.1	0.75
12	N-12	Conduct Inventory and Assessment: Invertebrates	N/A	N/A	N20	NF3	RES	12.3	0.5	11.8	0.5	12.8	0.5	0	0	0	36.9	1.5
13	N-13	Inventory & Evaluate Control of Non- native Species	N/A	N/A	N04 N05	NF3	RES	16.5	0.6	16.0	0.6	17.0	0.6	0	0	0	49.5	1.8
14	N-14	Conduct Inventory and Assessment: Amphibians and Reptiles	N/A	N/A	N20	NF3	RES	8.0	0.3	8.1	0.3	9.4	0.3	0	0	0	25.5	0.9
15	N-15	Conduct Inventory and Assessment: Mammals	N/A	N/A	N20	NF3	RES	9.3	0.3	9.8	0.3	10.8	0.3	0	0	0	29.9	0.9
16	N-16	Conduct a Survey and Assessment of Soils	N/A	N/A	N20	NF3	RES	12.3	0.3	0	0	0	0	0	0	0	12.3	0.3
17	I-06	Establish Program for Longterm Moni- toring of Natural and Cultural Setting	N/A	N/A	N20 C12	NF1 CF1	MON	30.0	0	30.0	1.0	30.0	1.0	30.0	1.0	30.0	120.0	3.0

PROGRAMMING SHEET 2
 UNFUNDED NATURAL RESOURCES ACTIVITIES
 (\$ in thousands)

FY: 91
 Park: TUZI
 Region: WESTERN

PK PRI NUM	PROJ STATH NUM	PROJECT OR ACTIVITY TITLE	PKG NUM	CULT RES TYPE	SERVICE- WIDE ISSUE(S)	FUNDING SOURCE		ACT TYPE	STARTING YEAR		OUTYEAR 1		OUTYEAR 2		OUTYEAR 3		TOTAL	
									\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE
18	I-07	Establish Geographic Information System	N/A	N/A	N20 C26	NF3	CF3	RES	22.2	0.3	14.5	0.3	16.0	0.3	0	0	52.7	0.9
TOTAL FOR ALL UNFUNDED NATURAL RESOURCES ACTIVITIES									373.7	6.65	236.1	5.25	220.7	4.75	48.0	1.6	878.5	18.25

PROGRAMMING SHEET 1
 CURRENT YEAR FUNDED CULTURAL RESOURCES ACTIVITIES
 (\$ in thousands)

FY: 91
 Park: TUZI
 Region: WESTERN

PROJ STMT NUM	PROJECT OR ACTIVITY TITLE	PKG NUM	CULT RES TYPE	SERVICE- WIDE ISSUE(S)	FUNDING SOURCE	ACT TYPE	CURRENT YEAR		OUTYEAR 1		OUTYEAR 2		OUTYEAR 3		TOTAL	
							\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE
C-01	Conserve Museum Objects	N/A	OBJC	C05	CF2	MIT	2.5	0.08	2.5	0.08	2.5	0.08	2.5	0.08	10.0	0.32
C-02	Manage Park Museum Collection	N/A	OBJC	C05	CF2	MIT	3.4	0.20	3.4	0.20	3.4	0.20	3.4	0.20	13.6	0.80
C-03	Update and Maintain Auto- mated National Catalog System Program	N/A	COMB	C02	CF2	RES	1.4	0.08	1.4	0.08	1.4	0.08	1.4	0.08	5.6	0.32
TOTAL FOR ALL FUNDED CULTURAL RESOURCES ACTIVITIES							7.3	0.36	7.3	0.36	7.3	0.32	7.3	0.32	29.2	1.44

PROGRAMMING SHEET 2
 UNFUNDED CULTURAL RESOURCES ACTIVITIES
 (\$ in thousands)

FY: 91
 Park: TUZI
 Region: WESTERN

PK PRI NUM	PROJ STATM NUM	PROJECT OR ACTIVITY TITLE	PKG NUM	CULT RES TYPE	SERVICE- WIDE ISSUE(S)	FUNDING SOURCE	ACT TYPE	STARTING YEAR		OUTYEAR 1		OUTYEAR 2		OUTYEAR 3		TOTAL	
								\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE
1	C-04	Preserve and Restore the Prehistoric Scene	N/A	SITE	C13	CF12	MIT	Land Acquisition Funding Needs Are Uncertain. Legislative Ceiling is \$1,350,000									
2	C-05	Survey and Inventory Collections for Tuzigoot Objects	N/A	OBJC	C09	CF5	RES	36.0	1.4	18.0	0.6	0	0	0	0	54.0	2.0
3	C-06	Catalog Backlog of Museum Collection	N/A	OBJC	C03	CF11	RES	11.0	0.4	0	0	0	0	0	0	11.0	0.4
4	C-07	Maintain Stabilized Prehistoric Ruins	N/A	STRC	C12	CF7	MIT	10.0	0.4	10.0	0.4	10.0	0.4	10.0	0.4	40.0	1.6
5	C-08	Analyze and Report on Tuzigoot Records and Artifacts	N/A	OBJC	C08	CF5	RES	20.0	0.6	20.0	0.6	10.5	0.3	0	0	50.5	1.5
6	C-09	Install Environ- mental Controls for Tuzigoot Museum	N/A	COMB	C16	CF6	MIT	35.0	0	90.0	0	5.0	0	0	0	130.0	0
7	I-04	Investigate Oldfield Vegetation Dynamics	N/A	CULL	C11	CF3	RES	15.0	0.6	0	0	0	0	0	0	15.0	0.6
8	C-10	Prepare Adminis- trative History	N/A	COMB	C08	CF5	RES	20.0	0	5.0	0	0	0	0	0	25.0	0

PROGRAMMING SHEET 2
 UNFUNDED CULTURAL RESOURCES ACTIVITIES
 (\$ in thousands)

FY: 91
 Park: TUZI
 Region: WESTERN

PK PRI NUM	PROJ STATM NUM	PROJECT OR ACTIVITY TITLE	PKG NUM	CULT RES TYPE	SERVICE- WIDE ISSUE(S)	FUNDING SOURCE	ACT TYPE	STARTING YEAR		OUTYEAR 1		OUTYEAR 2		OUTYEAR 3		TOTAL	
								\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE
9	I-05	Determine Visitor Impacts and Use Limits	N/A	COMB	C18	CF3	RES	15.5	0.7	12.0	0.5	0	0	0	0	27.5	1.2
10	C-11	Update/Correct the Cultural Resources Bibliography	N/A	COMB	C26	CF5	RES	5.0	0.2	0	0	0	0	0	0	5.0	0.2
11	C-12	Write Collection Management Plan	N/A	OBJC	C09	CF5	RES	4.8	0.2	0	0	0	0	0	0	4.8	0.2
12	C-14	Prepare Historic Structures Preservation Guide: Historic Structures	N/A	STRC	C06	CF5	RES	30.0	0	0	0	0	0	0	0	30.0	0
13	C-14	Prepare Historic Structures Preservation Guide: Pre-historic Structures	N/A	STRC	C06	CF5	RES	13.5	0.6	0	0	0	0	0	0	13.5	0.6
14	I-06	Establish Program for Longterm Monitoring of Natural and Cultural Setting	N/A	COMB	C12	CF1	MON	15.0	0	7.0	0.3	7.0	0.3	7.0	0.3	36.0	0.9
15	I-07	Establish Geographic Information System	N/A	COMB	C26	CF3	RES	22.2	0.3	14.5	0.3	16.0	0.3	0	0	52.7	0.9
16	C-15	Obtain Historic Photographs of Tuzigoot	N/A	COMB	C10	CF6	RES	21.0	0.8	0	0	0	0	0	0	21.0	0.8

PROGRAMMING SHEET 2
 UNFUNDED CULTURAL RESOURCES ACTIVITIES
 (\$ in thousands)

FY: 91
 Park: TUZI
 Region: WESTERN

PK PRI NUM	PROJ STATM NUM	PROJECT OR ACTIVITY TITLE	PKG NUM	CULT RES TYPE	SERVICE- WIDE ISSUE(S)	FUNDING SOURCE	ACT TYPE	STARTING YEAR		OUTYEAR 1		OUTYEAR 2		OUTYEAR 3		TOTAL	
								\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE
17	C-16	Maintain Historic Structures	N/A	STRC	C13	CF7	MIT	15.0	0.8	0	0	0	0	0	0	15.0	0.8
18	C-17	Establish Exhibit Maintenance	N/A	OBJC	C12	CF8	MIT	4.0	0.2	4.0	0.2	4.0	0.2	4.0	0.2	16.0	0.8
19	C-18	Analyze Existing Security System	N/A	COMB	C20	CF7	PRO	15.0	0.3	0	0	0	0	0	0	15.0	0.8
TOTAL FOR ALL UNFUNDED CULTURAL RESOURCES ACTIVITIES								308.0	7.5	180.5	2.9	52.5	1.5	21.0	0.9	562.0	12.8

PROGRAMMING SHEET 1
CURRENT YEAR FUNDED INTEGRATED ACTIVITIES
(\$ in thousands)

FY: 91
Park: TUZI
Region: WESTERN

PROJ STMT NUM	PROJECT OR ACTIVITY TITLE	PKG NUM	CULT RES TYPE	SERVICE- WIDE ISSUE(S)	FUNDING SOURCE	ACT TYPE	CURRENT YEAR		OUTYEAR 1		OUTYEAR 2		OUTYEAR 3		TOTAL	
							\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE	\$\$	FTE
I-01	Natural Resources Manage- ment and Administration	N/A	N/A	N24	NF2	ADM	3.0	0.1	3.0	0.1	3.0	0.1	3.0	0.1	12.0	0.40
I-02	Manage Pest Species	N/A	N/A	N24	NF2	MIT	6.0	0.2	6.0	0.2	6.0	0.2	6.0	0.2	24.0	0.80
I-03	Develop Bibliographic Assessment and Comp- uterized Biblio- graphic Information Retrieval System	N/A	N/A	N20	NF3	RES	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	0.00
TOTAL FOR ALL FUNDED INTEGRATED RESOURCES ACTIVITIES							14.7	0.3	9.0	0.3	9.0	0.3	9.0	0.3	41.7	1.20

Natural Resources Project Statements: Funded Program

The following project statements are a description of the natural resources protection and information program currently funded at Tuzigoot National Monument.

PROJECT STATEMENT

1. Project Number: TUZI-N-01
2. Project Title: Manage Vegetation: Rehabilitation, Landscaping, and Hazard Tree Removal

3. Service-wide Issue(s):

N22 - Overuse/Impacts to Recreation and/or Landscaped Zones

4. Problem Statement: Tuzigoot National Monument contains concentrated visitor use, past site excavation, past cattle grazing, social trailing, work access, and facilities development that result in occasional impacted areas. Staff has been careful to rehabilitate these sites with various techniques such as planting native plants, scarifying the soil and allowing natural restoration, closing work access to vehicles, etc.

Landscaping is also needed to maintain native plant composition that align with the prehistoric and historic land uses. It is also done with native plants to screen structures, to create a setting (some with cultural purposes), and to provide shade.

Hazardous trees have not yet been a problem at Tuzigoot because of the limited tree cover. However, trees were planted around the visitor center and residences several years ago, so periodic surveys will be done to document and remove hazardous trees and problem branches.

5. Alternative Actions/Solutions And Their Probable Impacts:

- a. No Action. This alternative would mean not rehabilitating impacted sites, not landscaping to maintaining native vegetation regardless of the relation with historic and prehistoric land uses, not perpetuating shade trees and aesthetic screenings, and not removing hazardous trees.

- b. Continue To Manage Vegetation. With this alternative, park staff will continue a comprehensive approach to manage vegetation. This will be done in a proactive manner by identifying areas that need revegetation and landscaping, gathering botanical information about specific species, obtaining seed stock for demonstration gardens, and identifying and removing hazardous trees.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. Develop a vegetation management plan for the monument that is comprehensive in providing information as well as guidelines for managing the plant systems. Staff will implement the program, which will entail site restoration, propagation of selected native species, demonstration garden, and landscaping for screening structures and perpetuation of the natural setting. Identification of hazardous trees will be done by trained park staff and their removal will be carried out by park staff or by a contractor.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least four other projects listed in this plan. These are as follows:

- TUZI-N-05 Conduct Riparian and Wetland Ecosystem Research
- TUZI-N-07 Conduct Visitor Use Survey
- TUZI-N-14 Inventory and Evaluate Control of Non-Native Species
- TUZI-C-04 Preserve and Restore the Prehistoric Scene

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personal Services	\$ 800	\$ 800	\$ 800	\$ 800
Travel and Per Diem	0	0	0	0
Supplies & Materials	<u>200</u>	<u>200</u>	<u>200</u>	<u>200</u>
Total	\$1,000	\$1,000	\$1,000	\$1,000

10. Annual Project Status and Accomplishments: This report will be initiated once final determination is made by WASO on the proper Servicewide format.

PROJECT STATEMENT

1. Project Number: TUZI-N-04
2. Project Title: Analyze Adjacent Land Use and Status
3. Service-wide Issue(s):
N16 - Visual and Biological Impacts of Urbanization and Other
Near-Park Development on Park Resources
4. Problem Statement: The Verde Valley of Arizona has an enormous array of recreational opportunities. According to Marshall A. Worden in the publication Papers in Community and Rural Development, 1981, "the Verde valley may well contain the greatest density of different types of vacation or recreational experiences of any similarly sized area in Arizona".

Concomitant local population growth has also increased dramatically as economic employment opportunities increased. Consequently, the diversification of land use practices are changing at an alarming rate. For example, one adjacent landowner is considering a development project that would build a large apartment complex adjacent to the Monuments boundary approximately 700 yards from the Tuzigoot ruins. Accelerated growth increases the frequency and complexity of resource issues while simultaneously reducing the amount of time that management has to react to resource concerns. The ingredients and characteristics that have created such an unusually rich and diverse environment for resource concerns are many.

A few examples of nearby land uses are: urbanization, aggregate stream mining, mine tailing deposition and storage, surface water diversions, agriculture, grazing, ranching, and recreational opportunities such as camping, golf, fishing, horseback riding, and boating. These activities are impacting the Monument's cultural and natural resources.

Without the basic baseline information necessary for assessing future changes in the area's hydrological regime and associated proximate land utilization factors coupled with development the historic and cultural scenes cannot be maintained adequately. An analysis of adjacent land use is a prerequisite step in determining the degree and magnitude of proximate factors that may influence management's ability to resolve or anticipate potential resource utilization conflicts. Preliminary investigations suggest that recent habitat conversions have already resulted in a loss of biological diversity and are

impacting the adjacent riparian corridor and the potential Tavaschi Marsh natural area.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. With this action the Monument will have to continue to operate without being able to estimate or predict significant external threats resulting from changing land use patterns. This places management in a difficult position of trying to preserve and protect a Cultural landmark without adequate knowledge of existing external threats.

b. Analysis of Adjacent Land Use and Status. Contract a Land Use research study that compares past and present land use patterns, evaluates present utilization conflicts and resource concerns that are currently impacting the Monument. The project should also attempt to develop a system that quantifies the potential risks associated with each resource threat or concern.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. The NPS will issue a research contract to document and map existing land uses, evaluate historical patterns of land use, and identify external threats resulting from adjacent land use practices. This would entail a three phase research study as follows:

1) Identify issues, concerns, and opportunities through the creation of land utilization maps that illustrate present uses, historical changes, and legal land status. Develop a research program to quantify and evaluate potential threats resulting from land use conflicts.

2) Analyze the management situation and assess the risks stemming from each external threat attributed to a land use pattern or concern.

3) Develop a cost effective monitoring protocol system to monitor external threats on a periodic basis, recommend management actions to mitigate or if possible eliminate external threats stemming from external land use patterns, and make recommendations on how to develop community awareness programs through interpretive and outreach programs.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2. Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project will support numerous other management activities or program that are trying to evaluate or monitor the condition of the culture and natural resources of the monument.

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Research Contract	\$18,000	\$18,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

Natural Resources Project Statements: Unfunded Program

The following project statements are a description of the natural resources protection and information program currently unfunded at Tuzigoot National Monument.

PROJECT STATEMENT

1. Project Number: TUZI-N-02
2. Project Title: Identify and Inventory Water-related Resource Attributes
3. Service-wide Issue(s):

N20 - Lack of Basic Data: Insufficient Understanding of Park Ecosystems and Threats to Them

4. Problem Statement: The water-related resource attributes of the monument have not been fully identified. This identification is necessary in the event that water development and use by parties outside of the boundaries of the monument affects or is likely to affect the resources of this unit or the purposes for which it was created. The identification and inventory is needed to both identify the possibility of impact and to measure its magnitude in the event impact does occur. This information will be required in water rights litigation or in any other similar arena in which the NPS seeks relief from such impact.

At present there exists an incomplete, and perhaps inadequate understanding of the relationship of water to the resources of the monument. The first step in developing this understanding is identifying and inventorying the nature and magnitude of resource attributes that are affected by or dependent upon water, both surface and subsurface.

The possibility of future impact to water-related resource attributes exists because of residential and commercial development which is increasing in locations peripheral to the site. Water withdrawals from aquifers underlying the monument or alterations in surface water flow regimes are likely to affect water-related resource attributes. Without an identification and inventory, assessments to arrest and reverse effects will be delayed resulting in additional or longer-lasting effects.

5. Alternative Actions/Solutions and their Probable Impacts:
 - a. No Action. This action would leave the monument without an adequate data base to protect its water rights or to understand the relationships between water resources of the monument and early man's activities at the site. Water resource attributes might be lost under such stewardship.

b. Conduct a Thorough Inventory of All Water-related Resource Attributes in Tuzigoot National Monument. Such a study will give the superintendent an adequate data base from which to make informed management decisions and to protect water rights. Such results will also be of use to other resource related inventories conducted in the monument.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. Identification and inventory of water-related resource attributes require a technical assessment of physical resources and scientific literature. This project is best undertaken by an interdisciplinary team working as a unit. Field and office assessments will result in summary reports, maps and atlases. When completed, additional projects and/or studies may be required to evaluate the nature and magnitude of the relationship between water and water-related resource attributes.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least two other projects listed in this plan. These are as follows:

- TUZI-C-06 Survey and Inventory Collections for Tuzigoot Objects
- TUZI-N-05 Conduct Riparian and Wetland Ecosystem Research
- TUZI-N-06 Delineate and Evaluate Strategies for Wetlands Protection

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Research Contract	\$25,000	\$25,000	\$25,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-N-03
2. Project Title: Restore Tavaschi Marsh
3. Service-wide Issue(s):

N12 - Alteration of Natural Flow Regimes/Groundwater Levels

4. Problem Statement: Tavaschi Marsh is located 0.6 miles southeast of Peck's Lake and about 650 yards northeast of Tuzigoot National Monument Headquarters. Tavaschi Marsh is fed by springs that emerge upstream from the 35 acre marsh. Of the 35 Tavaschi Marsh acres, approximately 10 acres are covered by cattails (Typha), and 25 acres consists of open water and or intermittently submerged meadows populated by Ranunculus, Cyperus, and Eleocharis species.

The most unusual faunal elements of this area are two species of Cattail marsh inhabiting birds. It is likely that both Sora (Porzana carolinensis) and Virginia Rails (Rallus limicola) breed at Tavaschi Marsh. Both are uncommon Arizona species and are only two examples of the 73 species of birds that are known to occur in the marsh area. Other water orientated vertebrates known to occur at the marsh include the Bullfrog (Rana catesbiana), Leopard Frog (Rana pipiens), Sonoran Mud Turtle (Kinosternon sonoriense) and the Muskrat (Ondatra zibethicus). Numerous other species such as coyotes, deer, and rabbits undoubtedly occur in the area. The marsh is drained by the Verde River which extends North and South. Archaeologically, Tavaschi Marsh is situated adjacent to the Tuzigoot pueblo-type dwellings that were occupied until the 14th century.

The marsh, an oxbow remnant of the Verde River, is owned by the Phelps-Dodge Corporation and is currently leased to the Tavaschi Family of Clarkdale, Arizona. Past negotiations have discussed the possibility of transferring Tavaschi marsh to the National Park Service (Arizona Academy of Science, Report No. 1, Tavaschi Marsh, 1973). Prior to reestablishing Tavaschi Marsh as a natural area this feasibility study which will delineate all potential concerns including, an ecological viability assessment, potential hydrological effects from nearby mine tailings, water quality issues, and jurisdictional liabilities, should be conducted. The marsh and its associated riparian habitats are valuable and scarce natural resources that are significantly integrated with the surrounding cultural landscapes. There are few marshes of scientific interest available in Arizona.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. This alternative entails maintenance of the status quo. The Tavaschi Marsh would remain under private ownership. Potential future development concerns of the marsh area would not be eliminated. Loss of cultural landscapes are expected along with visual and biological impacts resulting from the loss or conversion of this natural area to a more developed status.

b. Once Acquisition of the Marsh is Imminent, Conduct a Tavaschi Marsh Restoration Study. This action would entail assembling a NPS multidisciplinary team to evaluate all potential liabilities and develop strategies to restore the marsh area. Special attention would be given to marsh ecology, subterranean water flow and stability, adjacent stream dynamics, water quality and hydrological factors that influence the stability of Tavaschi Marsh in the general vicinity. Water quality issues and soils evaluations would require some laboratory testing. Spring gauges and local well information would have to be gathered in addition to information on potential point pollution sources. The multidisciplinary NPS team would decide on how to prioritize the issues and allocate monetary resources.

c. Accept Tavaschi Marsh Without Examining the Issues. This option would transfer stewardship of the marsh to the National Park Service without examining potential liabilities or other marsh restoration issues that may arise. The monument staff would have little information on how to restore or manage the Tavaschi Marsh as a natural area. Ecological and hydrological concerns may not be addressed adequately to satisfy local or national interests.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. A Multidisciplinary team would be assembled to examine all restoration issues. The team would conduct ecological and hydrological inventories along with legal assessments prior to restoration. Water quality, hydrological dynamics, and ecological evaluations would require some analytical laboratory testing over the first and second years. The study would be conducted over three years to obtain the necessary seasonal data which may be highly variable. A final report would be issued in the third year identifying the resources, manpower, monitoring programs, and management strategies necessary for complete restoration.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least seven other projects listed in this plan. These are as follows:

- TUZI-N-01 Manage Vegetation: Rehabilitation, Landscaping, and Hazard Tree Removal
- TUZI-N-04 Analyze Adjacent Land Use and Status
- TUZI-N-05 Conduct Riparian and Wetland Ecosystem Research
- TUZI-N-06 Delineate and Evaluate Strategies for Wetland Protection
- TUZI-N-08 Conduct Inventory and Assessment: Vegetation and Flora
- TUZI-N-13 Inventory and Evaluate Control of Non-Native Species
- TUZI-N-15 Resource Basic Inventory and Assessment: Mammals

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personal Services	\$25,000	\$20,000	\$20,000	\$ 0
Travel & Per Diem	5,000	4,500	3,500	0
Lab & Field Testing	10,000	20,000	5,000	0
Monitoring Equip.	15,000	0	0	0
Misc. Supplies	4,000	2,500	2,500	0
Reproductions/Reports	<u>0</u>	<u>1,000</u>	<u>2,000</u>	<u>0</u>
Total	\$59,000	\$48,000	\$33,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-N-05
2. Project Title: Conduct Riparian and Wetland Ecosystem Research
3. Service-wide Issue(s):
N20 - Lack of Basic Data: Insufficient Understanding of Park Ecosystems and Threats to Them
4. Problem Statement: Two levels of concern with this issue are: a) completion of an inventory and assessment of natural riparian and wetland resources; and b) an assessment of past, current, and proposed management actions and visitor activities on natural riparian and wetland resources. The prehistoric structures around which the major interest for visitors is focused are located on a hill immediately adjacent to the floodplain and riparian lands along the Verde River. Tavaschi Marsh is located in an ancient oxbow of the Verde River just north of the visitor's center. The surface and groundwater sources that currently support riparian ecosystems also served as water supplies for domestic and agricultural use for historic and prehistoric humans. Additionally, riparian vegetation produces the cooler, more mesic landscape that is so attractive to visitors in this arid region. Additional information is also needed for increasing the interpretive values and general understanding of these riparian lands. Tavaschi Marsh has been partially drained and badly overgrazed. Methods for rehabilitating this area need to be developed.
5. Alternative Actions/Solutions and Their Probable Impacts:
 - a. No action: Manage with insufficient knowledge of existing ecosystem components and processes with possible losses to both the natural and cultural landscapes and reduction in visitor satisfaction.
 - b. Conduct Riparian Ecosystem Research and Provide Management Alternatives Based on Scientific Findings. This option will provide management alternatives including proposed actions and probable results based on solid research findings. In addition to vegetation and faunistic implications of proposed management actions, attempts will be made to integrate information on soils, hydrology and flood regimes, and supporting information from current and past research programs in the area.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. An inventory of the riparian zone and wetlands adjacent to the ruins will examine both biotic and abiotic ecosystem components with emphasis on vertebrates and flowering plants. An assessment of major components will be conducted, e.g. for riparian trees, birds, and other groups that are determined to be of outstanding significance during the study. In addition, close monitoring of other studies is needed to interrelate and synthesis information of value to this project. Emphasis will be placed on ecological components, e.g. indicator species, that are of particular concern to interpreters and resource managers.

While additional subprojects may be identified from information gathered during the course of this study, major components of this project, as currently identified, are as follows:

1) Conduct an inventory and assessment of tree and shrub populations, their demographic structure, distribution, and health.

2) Examine hydrologic and soil parameters associated with riparianlands and wetlands.

3) Conduct an assessment of riparian and wetland plants and their interrelationships with hydrology, soil, and animals species.

4) Use information from the avian inventory and assessment to examine avian populations in relation to vegetational parameters and interpretive values.

5) Use information from the mammalian inventory and assessment to examine mammalian populations in relation to vegetational parameters with special emphasis on pest species, e.g. rock squirrels and ring-tailed cats.

6) Use information from the herpetological inventory and assessment to examine amphibians and reptiles with emphasis on their interrelationships with vegetational communities and interpretive values.

7) Use information from the invertebrate inventory and assessment to examine interrelationships with plants and other animals and interpretive values of such information.

8) Evaluate the ecological health of Tavasci Marsh. The marsh is located along with Peck's Lake in an ancient abandoned meander (oxbow) of the Verde River encircling much of the hill on which the ruins and visitor's center are located. The marsh has been largely drained and heavily overgrazed during the past several decades. Means of rehabilitating the marsh will be

examined.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least three other projects listed in this plan. These are as follows:

TUZI-N-02 Identify and Inventory Water-related Resources
Attributes
TUZI-N-03 Restore Tavaschi Marsh
TUZI-N-06 Delineate and Evaluate Strategies for Wetland
Protection

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personal Services	\$12,000	\$12,000	\$12,500	\$12,500
Travel and Per Diem	2,000	2,000	2,000	2,000
Supplies	1,500	1,500	1,500	1,500
Publication Costs	0	0	1,000	2,000
Total	\$15,500	\$15,500	\$17,000	\$18,000

First Year: Begin research with riparian and wetland vegetation, especially woody plant communities of the Verde River and wetland plants of Tavaschi Marsh, and make collections of riparian non-woody species.

Second Year: Begin collection of information documenting interrelationships between plant species and communities, and plants and animals in the riparian and wetland ecosystems.

Third Year: Start integration of information from other studies for riparian and wetland biotas, particularly information on vertebrates, endemic invertebrates, and riparian and wetland processes.

Fourth Year: Complete integration of information from all files, studies, etc. and prepare reports for resources management and interpretive programs. Provide management alternatives and projected results of management actions.

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-N-06
2. Project Title: Delineate and Evaluate Strategies for Wetland Protection
3. Service-wide Issue(s):
N16 - Visual and Biological Impacts of Urbanization and Other Near-Park Development on Park Resources

4. Problem Statement: Corp of Engineers and EPA regulations (33 CFR Section 238.3 and 40 CFR Section 230.3 respectively) define wetlands as "...areas that are inundated or saturated with surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions". This definition has been effect since 1977. Tuzigoot National Monument and the potential Tavaschi Marsh natural area have water resources that have not been evaluated or clearly delineated. External factors may be impacting the quality and quantity of the water at Tuzigoot National Monument which directly affects managements ability to preserve and protect the potential Tavaschi Marsh natural area and Monuments cultural resources. Ground water withdrawal may effect the long stability of the 14th century archeological ruins.

The Verde River and adjacent wetlands are integrated components of the cultural setting and are the primary resources responsible for maintaining the existing biological diversity. The General Management Plan (1975) calls for monument staff to preserve the integrity of the cultural and natural settings. This cannot be accomplished without evaluating the permanence of the existing riparian areas and wetlands using a multidisciplinary approach. A multidisciplinary strategy must be developed to generate management options to reduce the external pressures exerted upon the monument's resources. Furthermore, an examination of regulatory issues is mandatory to provide management with the appropriate context for decision making.

In addition to developing a multidisciplinary approach to collect the necessary field data and information, many technical judgments and inferences will have to be made to delineate and evaluate the wetlands in the appropriate jurisdictional setting. Operational methodologies need to be developed so that the monument can monitor the health and stability of the water resources. Administrative policies, guidelines, and constraints

will have to be reviewed extensively in the delineation process to secure and protect the monument's resources.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. With this alternative the monument will not be able to assess the degree of external threats and pressures exerted upon its cultural, natural and water resources. Management will have to make decisions in the absence of knowledge and without quantification of hydrological factors that are used in evaluating, delineating, and protecting cultural and natural resources and adjacent wetlands.

b. Delineate and Evaluate Monument Wetland Strategies for Protection. This option would entail contracting with a multidisciplinary research team to evaluate and delineate all wetlands and water resources issues and to quantify the current status of existing and potential water resource threats. Subterranean water flow, stability, and other hydrological factors should be examined along with stream dynamics and erosion potentials. Administrative guidance for these actions may be found in Executive Order 11990, the monument's 1975 General Management Plan, the current Resources Management Plan, and numerous DOI regulatory requirements and or guidelines. In addition to quantifying water resource threats, the research team would develop action orientated strategies to protect the Monuments water resources and the adjacent landscapes. Management alternatives and options would be identified to mitigate each threat after data collection and multiple factor analysis. All recommendations would be subsequently prioritized and evaluated on evidence.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. A multidisciplinary team would be contracted or assembled to address the above concerns as outlined in the above problem statement. NPS specialists, along with other subject experts, would participate actively to develop the necessary management strategies involved in protecting the monument's resources. Some technological analysis may have to be contracted to obtain the necessary field data and hydrological information.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least three other projects listed in this plan. These are as follows:

- TUZI-N-02 Identify and Inventory Water-related Resources
Attributes
- TUZI-N-03 Restore Tavaschi Marsh
- TUZI-N-05 Conduct Riparian and Wetland Ecosystem Research

9. Funding:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Research Contract	\$20,000	\$30,000	\$33,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-N-07
2. Project Title: Conduct Visitor Use Survey
3. Service-wide Issue(s):
N24 - Other Issue (Lack of visitor use information)

4. Problem Statement: No formal visitor use data collection is known to have ever occurred at Tuzigoot National Monument. The Summary Results of the Public Area Recreation Visitor Survey Open-ended Questions memo (resulting from the interagency PARVS study conducted in 1985) distributed to participating areas by the WASO Recreation Resources Assistance Division in December, 1986 contained only cursory information regarding visitor impressions of the Montezuma Castle, but not Tuzigoot, recreational experience. Results from the balance of this survey are still pending and are not expected to contain much additional information addressing Tuzigoot. Available baseline visitor data addressing Tuzigoot is therefore at a premium.

Visitor use information provides a manager with highly valuable insight into a host of visitor characteristics including demographics, perceptions, expectations, satisfactions, and behavior. Knowledge of these aspects enhances the manager's ability to: 1) provide the user public with high-quality recreational experiences, and 2) preserve and protect the values which attract visitors and for which the monuments were established.

Visitor use information is helpful under any level of visitation, but its value increases greatly as visitation grows. Visitation at Tuzigoot has roughly doubled since 1970, increasing 30 percent since 1980 and exceeding 108,000 in 1988. The trend for sharply increased visitation is expected to continue indefinitely, thereby steadily increasing the already great need for essential baseline visitor information.

Although never satisfied, the need to accumulate basic visitor data through research on "visitor use patterns pertinent to Tuzigoot for its resource management and interpretive programs" is clearly stated as a resource management objective in the 1975 Final Master Plan for the monument.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. The historical lack of baseline visitor information continues, further suppressing monument personnel in their efforts to sensitively and effectively manage visitors while providing them with quality visits. Lack of survey implementation also fails to satisfy the visitor use information directive stated in the 1975 Final Master Plan for the monument.

b. Conduct Visitor Use Survey. This survey could and would ideally be done in conjunction with the survey for Montezuma Castle and Well since all three units are typically visited as a group and are administrated together. A mail-in questionnaire design would be least expensive in terms of taxing monument personnel. This type of survey is widely used in public recreation areas nationally because of its flexibility, comprehensiveness, and relative ease of administration and interpretation of results. Such surveys can be tailored to provide managers with precisely what they need to know concerning their visitor population. Survey information can identify visitor related problems and form the basis for appropriate management actions.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. Conduct a visitor use survey using a mail-in questionnaire tailored to the perceived visitor use informational needs of monument personnel would be constructed off-site by NPS/CPSU or private contractor. The questionnaire would be distributed on-site by monument personnel according to specified random distribution guidelines. All questionnaire data would be computerized and results generated using appropriate social science software.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least two other projects listed in this plan. These are as follows:

TUZI-I-05 Determine Visitor Impacts and Use Limits
TUZI-I-06 Establish Program for Long-term Monitoring of
Natural and Cultural Setting

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>
Survey Questionnaire Design	\$ 3,500	\$ 0
Questionnaire Execution	3,000	0
Data Analysis	3,500	0
Travel and Per Diem	1,000	0
Publication Costs	<u>800</u>	<u>0</u>
Total	\$11,800	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-N-08
2. Project Title: Conduct Inventory and Assessment:
Vegetation and Flora
3. Service-wide Issue(s):

N20 - Lack of Basic Data: Insufficient Understanding of Park
Ecosystems and Threats to Them

4. Problem Statement: This project will consist of a botanical RBI (resources base inventory) of the monument to provide new information for management and interpretation. Vegetation is the keystone of natural ecosystems, serving as a basis for animal life and as a synthesizer of environmental factors, including geology, soils, slope, exposure, and climate. Thus, vegetational analyses can be used as a tool for examining potential environmental problems within the monument. The baseline established by this study will allow future managers to assess such factors as changes in alien plant species and communities, changes in surface and groundwater regimes, and stability or lack of stability in plant communities.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. This will leave management vulnerable to being unable to detect changes in the vegetation and flora, thus also related changes, e.g. in flow levels of surface or groundwater. Additional information for interpretation of botanical parameters will not be forthcoming.

b. Conduct Vegetation Inventory and Assessment Only. This will assist management in monitoring long time environmental changes in the monument environment but will not allow early detection of such problems as invasion of alien species.

c. Conduct Flora Inventory and Assessment Only. This will assist management in detecting undesirable changes, e.g. invasion of alien plant species but will not provide adequate vegetational information to serve as an effective early warning system for undesirable changes in the monument's environment.

d. Conduct Vegetation and Flora Inventory and Assessment. This will increase management's ability to assess changes in the natural resources of the monument. Close monitoring of the vegetation and flora can serve as an early warning system for

undesirable changes and increase management's ability to respond effectively to these changes in a timely manner. Additional botanical information will be provided for interpretive programs.

6. Description of the Recommended Project or Activity: Option d. is the recommended solution for this issue. This project will consist of the following two components: 1) inventory and assessment of the flora; and 2) inventory and assessment of the vegetation. Vegetation is composed of plant communities, e.g. desertscrub or riparian woodland, and is the keystone of natural ecosystems, serving as a basis for animal life and as a synthesizer of environmental factors, including geology, soils, slope, exposure, and climate. Vegetation, in turn, is made up of the collective plant species of the monument, or flora. Data will be collected concerning the distribution, composition, structure, evolution, and aerial extent of vegetation.

A basic botanical survey, description, and synthesis of existing and new information will be completed, adding new information from the project to the information now contained in the herbarium and monument files. Researchers will provide information which will upgrade interpretation of the monument's flora and vegetation.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least one other project listed in this plan. This is as follows:

TUZI-N-05 Conduct Riparian and Wetland Ecosystem Research

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personal Services	\$6,000	\$6,500	\$6,500	\$ 0
Travel and Per Diem	1,300	1,300	1,300	0
Equipment and Supplies	200	200	200	0
Publication Costs	<u>0</u>	<u>0</u>	<u>1,000</u>	<u>0</u>
Total	\$7,500	\$8,000	\$8,000	\$ 0

First Year: Begin collection and identification of flora during all four seasons.

Second Year: Continue collection and identification of flora during all four seasons. Start classification of vegetational communities.

Third Year: Finish collection and identification of flora. Prepare reports for resources management and interpretive programs. Provide management alternatives and projected results of management actions.

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-N-09
2. Project Title: Conduct Assessment of Rare and Endemic Species
3. Service-wide Issue(s):
N20 - Lack of Basic Data: Insufficient Understanding of Park Ecosystems and Threats to Them

4. Problem Statement: Some rare and endemic species have been identified within the monument. There has not been, however, a systematic survey and search to identify all rare plants and animals at Tuzigoot. It is probable that additional rare and endemic life forms occur in the monument that may require protective management. Of special concern are Federally listed threatened, endangered or candidate species which require protection under the Endangered Species Act and its amendments.

Monument staff also needs to be aware of any rare plants and animals that potentially occur near monument boundaries. Adjacent land uses at boundaries can have positive or negative impacts on limited populations. For example, wildlife at boundaries move into and out of monument lands through wildlife corridors such as stream riparian systems. Knowledge about rare forms is required in order to work with monument neighbors in protecting biologic and genetic diversity.

5. Alternative Actions/Solutions and Their Probable Impacts:
 - a. Continue Current Activities. Rare and endemic species will be identified and mapped intermittently over the years on a hit or miss basis. Lack of knowledge regarding endemic species limits the Superintendent in making proper judgments about managing the Monument's resources. It will be unclear whether a species is naturally rare or rare due to man's activities.
 - b. Carry Out Recommended Assessment of Species. By assessing occurrence and distribution of rare and endemic species, the superintendent can properly manage these species in accord with NPS management policies, monument enabling legislation, and the Endangered Species Act.

6. Description of the Recommended Project or Activity: Action b. is the recommended solution for this issue. Published and gray literature will be searched, reviewed and annotated. An annotated bibliographic report will be prepared of all reported rare, endemic or otherwise sensitive plant and animal species. Annotators will scrutinize existing ecologic, life historical, taxonomic and distributional information for each species.

A thorough search of monument habitats will be conducted of all terrestrial and aquatic plants and animals considered to be rare and endemic. Through consultation with other specialists, the principal investigator will prioritize the list of rare and endemic life forms. For species not requiring complex management strategies, action plans will be prepared. Where additional species-specific studies may be required, the principal investigator will propose in writing draft project statements for inclusion in the monument's Resources Management Plan.

A final report will be prepared summarizing findings from this investigation. It will include, but not be limited to, lists of species with annotated summaries of life history and ecologic information, range/distribution data, maps of species occurrences in and around the monument. Written recommendations will be provided to the Superintendent for use of study findings in the Monument's interpretive plan.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least ten other projects listed in this plan. These are as follows:

- TUZI-N-01 Manage Vegetation: Rehabilitation, Landscaping, and Hazard Tree Removal
- TUZI-N-04 Analysis of Adjacent Land Use and Status
- TUZI-N-05 Conduct Riparian and Wetland Ecosystem Research
- TUZI-N-06 Delineate and Evaluate Strategies for Wetland Protection
- TUZI-N-08 Conduct Inventory and Assessment: Vegetation and Flora
- TUZI-N-12 Conduct Inventory and Assessment: Invertebrates
- TUZI-N-13 Inventory and Evaluate Control of Non-Native Species
- TUZI-N-14 Resource Basic Inventory and Assessment: Amphibians and Reptiles
- TUZI-I-03 Develop Bibliographic Assessment and Computerized Bibliographic Information Retrieval System
- TUZI-I-04 Investigate Oldfield Vegetation Dynamics

9. Funding Requirements

	<u>Year 1</u>	<u>Year 2</u>
Personal Services	\$12,000	\$ 0
Travel and Per Diem	2,000	0
Supplies	1,000	0
Publication Costs	<u>800</u>	<u>0</u>
Total	\$15,800	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-N-10
2. Project Title: Construct Boundary Fence
3. Service-wide Issue(s):

N19 - Loss of Park Resources Due to Consumptive Practices
(hunting, fishing, commercial fishing, grazing)

4. Problem Statement: Tuzigoot is located in an area that is becoming more urbanized. The Verde Valley is popular retirement location in addition to people who want to live and work in a less busy area than nearby cities of Flagstaff and even Phoenix. Tourism is also increasing due to the prehistoric and historic interests of the Valley as is recreation in the riparian area.

When the locality was rural, Tuzigoot had little pressure from trespass or vandalism. Occasionally, neighboring cattle would wander onto the monument, but fencing and a cattle guard around the existing boundary has stopped that problem.

The problem now has magnified due to a housing development on the ridge south of the monument. A current plan of the Phelps Dodge Corporation is to develop Verde Valley Ranch, which entails 1700 sites on 900 acres. Some of this is within the current authorized boundary (Public Law 95-625, 1978), but on land that park management has stated it does not want. The Regional Director approved an amendment to the Tuzigoot Master Plan on January 21, 1989 which details the preferred boundary. The Verde Valley Ranch will abut the west boundary of the monument, and houses will be built along that edge.

External activities to the monument are partying along the Verde River, ATV touring, fishing, woodcutting, hiking, farming, grazing, boating, residing, pleasure driving, country club activities (golfing), etc. At this time there has been no vandalism to the ruins or park developments, but with increased development and adjacent residential areas, the monument will be predisposed to damage and theft.

A fence is needed to designate the boundary when the boundary revision occurs. It would provide protection to the cultural and natural resources and facilities. While a boundary fence can not totally protect the monument, it provides some deterrence to vandalism and theft. By identifying the boundary, trespassers will be notified about property ownership, poaching, theft, etc.

Without a fence, people could not know they were on monument land.

5. Alternative Action/Solutions and Their Probable Impacts:

a. No Action. This action will be to keep the fence around the existing boundary and not fence the new, expanded boundary when it is revised. This will not designate the revised boundary and notify people when they are on monument land.

b. Fence Revised Boundary. When the existing boundary is revised, a fence would be constructed around the approximate seven-mile perimeter.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. Construct a fence around the seven mile perimeter. A four strand, smooth wire fence will be built and NPS boundary line posted along it. The fence would be built to accommodate wildlife, such as deer, elk, and antelope that would want to cross it. A contractor would be hired to survey the line and build the fence.

7. Compliance: This project is categorically excluded from NEPA compliance, Department Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U. S. Department of Interior. However, a search along the boundary will be necessary for endangered species. NHPA compliance under Section 106 will be necessary as well due to potential disturbance of archeological sites by the process of fence construction.

8. Relationships: This project is related to at least six other projects listed in this plan. These are as follows:

TUZI-I-02 Manage Pest Species
TUZI-N-03 Restore Tavaschi Marsh
TUZI-N-06 Delineate and Evaluate Strategies for Wetland Protection
TUZI-C-07 Maintain Stabilized Prehistoric Ruins
TUZI-C-16 Maintain Historic Structures
TUZI-I-05 Determine Visitor Impacts and Use Limits

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>
Survey and Fencing Contract	\$70,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-N-11

2. Project Title: Conduct Inventory and Assessment:
Birds

3. Service-wide Issue(s):

N20 - Lack of Basic Data: Insufficient Understanding of Park
Ecosystems and Threats to Them

4. Problem Statement: Changes in riparian and adjacent upland ecosystems, such as those in the vicinity of Tuzigoot National Monument, have resulted in severe reductions in avian species diversity and population densities through most of the Southwest. Important attributes of birds include diurnal activity, songs and prominent displays, and the interest of a large number of people in birdwatching. These factors have provided an information base generally making the avifauna one of the best tools for evaluating the biological health of an ecosystem. Tuzigoot has been maintained in relatively pristine conditions since establishment of the monument. Still, reconstruction of the earlier biological landscapes of the area from journals of earlier explorers and residents and through comparison of modern photos with old photos indicate that even these areas were heavily impacted by the end of the 20th century. Activities that reduced and modified the extensive riparian and adjacent upland vegetative communities, and presumably the dependent avifauna, included trapping of beavers and destruction of their dams, overgrazing, and surface water withdrawal. This project is designed to supplement the basic avifaunal information contained in the monument files by providing more information about the interaction of key avian species (indicator species) with the rest of the monument environment.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. Problems which need to be addressed, such as those in the riparian forest, and that need information from these avian studies will continue to exist. Additional information about birds for interpretive programs will not be forthcoming.

b. Conduct Avian Biological Inventory and Assessment. This will provide information which will serve as an additional management tool for examining the ecological health of the monument,

especially riparian ecosystems. Interpretive information about the avifauna will be made available for visitors.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. Species richness and relative densities for avian species in the monument will be examined. Species that have specialized ecological requirements related to interpretive programs or resource management problems will be studied in relationship to those requirements. An annotated checklist of birds seen at Tuzigoot National Monument, suitable for sale at the visitor center, will be produced in conjunction with a similar checklist for Montezuma Castle National Monument.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least one other project listed in this plan. This is as follows:

TUZI-N-05 Conduct Riparian and Wetland Ecosystem Research

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personal Services	\$5,200	\$5,400	\$5,700	\$ 0
Travel and Per Diem	1,800	1,800	1,800	0
Equipment and Supplies	1,000	200	200	0
Publication Costs	0	0	1,000	0
Total	\$8,000	\$7,400	\$8,700	\$ 0

First Year: Begin avian studies for species richness and relative densities.

Second Year: Continue avian studies as first year plus select indicator species and special status species (rare, declining or increasing populations, etc.).

Third Year: Write up studies, prepare interpretive information, prepare annotated checklist in conjunction with Montezuma Castle birds.

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-N-12
2. Project Title: Conduct Inventory and Assessment:
Invertebrates
3. Service-wide Issue(s):

N20 - Lack of Basic Data: Insufficient Understanding of Park
Ecosystems and Threats to Them

4. Problem Statement: The invertebrates are a large and diverse group of animals occupying terrestrial and aquatic environments at Tuzigoot National Monument. The vast number of species and difficulties of identifying specimens make invertebrates relatively difficult to study. Nonetheless, they are responsible for a number of vital ecosystem functions. The best known groups of invertebrates are probably the Classes Insecta, Crustacea and Mollusca. Many members of these groups are known because they are economically and medically important as pests. However, the description of species new to science is not atypical among workers specializing in a particular Family or Genus of insect, crustacean or mollusk. It is highly probable that tens of taxa in these three groups remain undescribed in the monument.

There are no known impacts on health and public safety, however, a number of insects, ticks and other invertebrates are known to cause debilitating and life-threatening diseases. Biting insects such as bees and wasps may also threaten hyper-allergic people.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. This alternative entails maintenance of the status quo. No research on native invertebrates would be undertaken.

b. Inventory the Existing Invertebrates. This alternative calls for an inventory of invertebrates at Tuzigoot. The project should be phased to concentrate on Families or Orders of invertebrates. Specific taxonomic groups to be inventoried should include those that are preserved and studied easily. Protozoans, although of interest and importance in the monument, could only be studied cost-effectively on a very limited scale. This is true of other groups such as the Platyhelminthes and nematode worms as well. Only a few specialists are available world-wide to study some groups of invertebrates. The studies

should be designed to sample the biotic diversity of insects, crustaceans, mollusks and other better known groups of invertebrates. Organisms occupying different environments (i.e., aquatic or terrestrial) will probably be studied most effectively by different specialists.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. An inventory of native invertebrates will be conducted at Tuzigoot National Monument. This effort should initially concentrate on insects, crustaceans, mollusks and other relatively well known groups. Inventories should also be defined by habitats. A variety of collecting techniques should be used to effectively sample the diversity of invertebrates and their habitats. A seasonal sampling regime would allow the researcher to make initial determinations of relative abundance, reproductive strategies, and other natural history attributes.

The inventories should be implemented with a comprehensive review of pertinent literature. Data should be analyzed using simple descriptive statistics (e.g., mean, standard deviation, etc.) and the entire set should be presented to NPS. The research should also develop recommendations for subsequent studies which may provide information having management significance. Studies during the last two years of the project should concentrate on taxa of management concern or exceptional scientific interest.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least three other projects listed in this plan. These are as follows:

TUZI-N-09	Conduct Assessment of Rare and Endemic Species
TUZI-N-13	Inventory and Evaluate Control of Non-native Species
TUZI-I-06	Establish Program for Long-term Monitoring of Natural and Cultural Setting

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personnel Services	\$ 9,500	\$ 9,500	\$ 9,500	\$ 0
Travel and Per Diem	1,800	1,800	1,800	0
Supplies	1,000	500	500	0
Publication Costs	<u>0</u>	<u>0</u>	<u>1,000</u>	<u>0</u>
Total	\$12,300	\$11,800	\$12,800	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-N-13
2. Project Title: Inventory and Evaluate Control of Non-native Species
3. Service-wide Issue(s):
N05 - Degradation of Park Resources Due to Non-Native Plants
N04 - Degradation of Park Resources Due to Non-Native Animals

4. Problem Statement: The National Park Service is aware of some non-native species that occur at Tuzigoot National Monument. Less is known, however, about their abundance, distribution, and population trends. Lacking an inventory, it is likely that additional non-native species occur in the monument but have not yet been detected. Some problems perhaps have not yet been identified because of their subtlety. For example, a non-native insect(s) might compete with and replace a native insect which is essential (a symbiotic partner) in pollinating a native plant.

However, some non-native problems have been identified. Salt cedar is invading the Verde Valley and is spreading into riparian habitats near Tuzigoot National Monument. Other non-native plants, displaying differing aggressiveness on a case by case basis include Russian thistle, Russian olive, horehound, woolly mullein, puncturevine, filaree, red brome, and bermuda grass. Several non-native plant species have been introduced to the monument as a result of past settlement, grazing, farming, excavation and construction in and around these areas. Cheatgrass, wild barley, and foxtail recently invade from grazed to ungrazed lands. Arizona Department of transportation seeds exotic Lehmann lovegrass along highways and it also occurs in these areas.

Known non-native animals at Tuzigoot include house sparrow, rock dove and starlings. Starlings are known to aggressively replace native primary and secondary cavity nesting bird species. Non-native mammals include feral cats and house mice. Non-native animals in aquatic habitats at Tuzigoot include bullfrog, eastern box turtle, smallmouth bass, mosquitofish, green sunfish, carp, and black bullhead. The Asiatic clam is found in the Verde River. Its larvae are aggressive colonizers and the species is still abundant throughout the Verde Valley.

5. Alternative Actions/Solutions and Their Probable Impacts:

- a. No Action. This alternative is not acceptable under NPS management guidelines and would constitute a dereliction of responsibilities on the part of the monument.
- b. Maintain Current Non-native Species Control Program. Current and recent non-native control at Tuzigoot have been sporadic and infrequent. Staff has removed some horehound and sour sweetclover in crucial locations. An on-going contracted plant survey at Tuzigoot National Monument will provide some preliminary information on non-native plants, but it is not designed to be an extensive survey.

Lacking both a thorough non-native species inventory and a set of recommendations for control strategies, little can be done to control or eliminate those non-native species causing the most extensive ecosystem alterations. Such ecosystem changes probably are not irreversible, but without baseline information about non-native species, resource managers can only use intuition and speculate on outcomes.

- c. Complete an Inventory and Carry out Non-native Species Control Program. Inventorying non-native plants, their distribution, abundance and seasonal occurrence, is necessary to understand the extent of these plants and assess any problems. With this information, management can determine which species need to be controlled and which will be tolerated. Some species may be very abundant and widespread, characteristics that make removal infeasible. Staff will also become aware of potential introductions outside the monument which could affect lands under their jurisdiction (e.g., roadside seeding, farming, grazing).

Without the inventory, gradual or rapid expansion of non-native species might remain unknown. Natural communities will be altered in some cases. NPS policies require removal of non-native species. Recommendations are needed regarding feasibility of eliminating non-native species and re-establishing natives.

6. Description of the Recommended Project or Activity: Option c. is the recommended solution for this issue. This project can be contracted through the Cooperative Park Studies Unit or conducted by NPS scientists. This study will be comprised of three phases, as follows:

1. Complete and inventory of alien plants and animals. Categorize these into species that are the most aggressive and that actually or potentially cause the greatest ecosystem change or loss of native biotic diversity.

2. Develop management guidelines with control feasibility and cost evaluations for the highest priority and most threatening alien species. Include basic information on distribution, rate of spread etc. Historic aerial and ground photographs may be useful for these determinations. Thoroughly review literature to determine what is known about the ecology of these species. Recommend available management (control techniques or if unavailable, recommend control strategies with associated re-establishment of native species where appropriate. Such strategies might include physical removal experiments, prescribed fire, use of herbicides or insecticides, biological control or some combination of these. Consult with other specialists, as required, to develop sound strategies. establish experimental treatment plots, where appropriate. Monitor success/failure of the treatment methodology during the course of the study. Train monument personnel to carry out long-term monitoring of test plots, if appropriate.

3. Prepare a scientific report providing results from the inventory and evaluations. Also provide the superintendent with written management plans ("cook books") or manuals for removing the most crucial alien plant and animal species. Finally, provide written material and recommendations for applicability of findings to the interpretive program of the monument. Proper explanation to the public of the problem and solution can develop public support and perhaps even participation in the removal program.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least seven other projects listed in this plan. These are as follows:

- TUZI-N-01 Manage Vegetation: Rehabilitation, Landscaping, and Hazard Tree Removal
- TUZI-N-04 Analysis of Adjacent Land Use and Status
- TUZI-N-05 Conduct Riparian and Wetland Ecosystem Research
- TUZI-N-06 Delineate and Evaluate Strategies for Wetland Protection
- TUZI-I-03 Develop Bibliographic Assessment and Computerized Bibliographic Information Retrieval System
- TUZI-I-04 Investigate Oldfield Vegetation Dynamics
- TUZI-I-06 Establish Program for Long-term Monitoring of Natural and Cultural Setting

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personnel Services	\$12,000	\$12,500	\$13,000	\$ 0
Travel and Per Diem	2,500	2,500	2,500	0
Supplies	2,000	1,000	500	0
Publication Costs	<u>0</u>	<u>0</u>	<u>1,000</u>	<u>0</u>
Total	\$16,500	\$16,000	\$17,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-N-14
2. Project Title: Conduct Inventory and Assessment: Amphibians and Reptiles

3. Service-wide Issue(s):

N20 - Lack of Basic Data: Insufficient Understanding of Park Ecosystems and Threats to Them

4. Problem Statement: Both upland and riparian herps will be studied. Herps are commonly the most poorly understood of the vertebrate species in an area. Since herps are poikilothermous ("cold-blooded") they are easily affected by slight changes in temperature, as between shady and sunny microhabitats, thus are probably the most reliable vertebrate indicators of habitat change. In addition, many species require moist habitats, during parts or all of their life cycles, especially amphibians such as frogs and toads.

Although changes in riparian ecosystems have resulted in severe reductions in species diversity and population densities for many plant and animal species the impacts of these riparian habitat losses on the herpetofauna (amphibians and reptiles) have not been as well documented as for birds. One group of reptiles, rattlesnakes, constitutes a safety hazard for visitors and their distribution needs to be better understood. Understanding distribution and relative stability of amphibian and reptile species is thus an important element of vertebrate biology in relation to resource management and interpretation.

5. Alternative Actions/Solutions and Their Probable Impacts:

- a. No Action. Baseline information important to interpretive programs will not be gathered. Information that would assist in monitoring of environmental changes and changes in biological diversity will not be available for resource managers or for interpretation to the visiting public.

- b. Conduct Biological Inventory and Assessment of Amphibians and Reptiles. This will provide additional information to aid the management in maintaining biological diversity in the monument as well as providing information for interpretive exhibits and presentations.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. Species richness and relative densities for amphibians and reptiles in the monument will be examined. Species that have specialized requirements that are of interest to interpretive programs or resource management problems will be studied in relationship to those requirements. A field checklist will be produced.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least two other projects listed in this plan. These are as follows:

- TUZI-N-05 Conduct Riparian and Wetland Ecosystem Research
- TUZI-I-06 Establish Program for Long-term Monitoring of Natural and Cultural Setting

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personal Services	\$6,000	\$6,500	\$7,000	\$ 0
Travel and Per Diem	1,300	1,300	1,300	0
Equipment and Supplies	700	300	100	0
Publication Costs	<u>0</u>	<u>0</u>	<u>1,000</u>	<u>0</u>
Total	\$8,000	\$8,100	\$9,400	\$ 0

First Year: Begin herp project with contractor.

Second Year: Continue projects with emphasis on rare and poorly known species, using information gathered during the first year.

Third Year: Finish field work and prepare reports for management and assistant superintendent with interpretive information.

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-N-15
2. Project Title: Conduct Inventory and Assessment: Mammals
3. Service-wide Issue(s):

N20 - Lack of Basic Data: Insufficient Understanding of Park Ecosystems and Threats to Them

4. Problem Statement: Changes in riparian and upland ecosystems have resulted in species composition and population densities through most of mammals in the Southwest. Some mammalian species are of interest because of recreational pursuits (i.e., hunting), they are disease vectors or they cause economic losses. The majority of mammalian species are poorly known by land managers, wildlife managers and the general public. Tuzigoot National Monument has been maintained in relatively pristine conditions since establishment of the monument in 1939. Still, reconstruction of the earlier biological landscapes of the area from journals of earlier explorers and residents and through comparison of modern photos with old photos indicate that even these areas were heavily impacted by the end of the 20th century. Activities that reduced and modified the extensive riparian vegetative communities, and presumably many mammals included, trapping and predator control, grazing, conversion of plant communities and surface water withdrawal. This project is designed to supplement and develop baseline information on mammals within the monument, providing more information about the interaction of key mammalian species (indicator species) with the rest of the monument environment, and document the biological diversity of mammals.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. This alternative entails maintenance of the status quo. Monument staff will rely on the existing scant database to make management decisions affecting native mammals. No research on native mammals will be conducted.

b. Conduct Mammalian Inventory and Assessment. This will provide information on native mammals which will serve as an additional management tool for examining the ecological health of the monument ecosystems. It will also provide information on relative abundance and natural history characteristics of species. The inventory will be conducted using non-destructive

sampling techniques such as live trapping, mist netting and observation.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. This program will document the occurrence of native mammals and their relative abundance within riparian, wetland and upland habitats. Species that have habitat requirements that are related to interpretive programs or resource management problems will be studied in relationship to those requirements. An annotated checklist suitable for sale at the visitor center will be produced.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least three other projects listed in this plan. These are as follows:

TUZI-N-02 Manage Pest Species
TUZI-N-05 Conduct Riparian and Wetland Ecosystem Research
TUZI-I-06 Establish Program for Long-term Monitoring of Natural and Cultural Setting

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personal Services	\$ 6,500	\$ 7,000	\$ 7,500	\$ 0
Travel and Per Diem	1,800	1,800	1,800	0
Supplies	1,000	1,000	500	0
Publication Costs	0	0	1,000	0
Total	\$ 9,300	\$ 9,800	\$10,800	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-N-16
2. Project Title: Conduct a Survey and Assessment of Soils
3. Service-wide Issue(s):
N20 - Lack of Basic Data: Insufficient Understanding of Park Ecosystems and Threats to Them

4. Problem Statement: The soils of Tuzigoot National Monument have never been surveyed or mapped. No site specific information exists that can be used by the superintendent to make informed decisions regarding management of pastures and open fields on prehistoric agricultural lands within the monument, location of visitor use facilities, protection of cultural sites and critical habitats, and prevention of soil erosion.

This project will also develop data for the monument's geographic information system, and provide baseline information useful in integrating other ecological studies performed at Tuzigoot National Monument.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. This alternative would force the superintendent to continue to manage the monument without a general soils map and the attendant information a soil survey provides. Better information makes for better management. This no action alternative may well leave the superintendent out of compliance with laws and regulations governing protection of antiquities, water quality, historic landscapes, and visitor safety.

b. Conduct a Soil Survey. The information resulting from this survey will contribute significantly to allowing the superintendent to manage the monument resources, both cultural and natural, on an informed basis. Visitor facilities can be located in areas with stable soils; areas of high erosive potential can be delineated and protected from human impacts; management requirements for the prehistoric agricultural fields can be scientifically developed; and, information on soils, which often are a major ecological controlling factor, can be made available to researchers working on other park problems, thus enhancing their ability to draw solid conclusions from their data bases.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. The Soil Conservation Service, the U.S. Forest Service, a university researcher, or a private consultant should be funded to conduct a level III soil survey of the monument. This project can be conducted independent of any other project underway or planned for the monument. Products of this survey should include a detailed soils map, soil series descriptions, and an assessment of the significant properties of the monument's soils as related to cultural site preservation, prehistoric landscape scene preservation, ecological protection, and visitor services development.

This project will first require that low level black and white aerial photography be taken of the monument. Once the photography has been acquired, approximately one person-week of office work with the aerial photographs will be needed to delineate soil associations on a preliminary working map. Following this work, approximately one person-week will be required on-site to ground truth and refine the preliminary map. Following the field work, approximately one person-month will be needed in the office to finalize the maps, prepare the soil series descriptions, prepare an assessment of soil properties relative to managing Tuzigoot National Monument, and write the final report. A draft final report should be ready for NPS review within six person-weeks of project initiation. Professional skills equivalent to or above GS-11 is needed for this project.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This is a baseline project that supports all other Tuzigoot National Monument projects that are concerned with ecological components or cultural resources scene preservation.

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>
Personal Services	\$ 6,500	\$ 0
Travel and Per Diem	1,800	0
Aerial Photography	3,000	0
Publication Costs	<u>1,000</u>	<u>0</u>
Total	\$12,300	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

Cultural Resources Project Statements: Funded Program

The following project statements are a description of the cultural resource protection and information program currently funded at Tuzigoot National Monument.

PROJECT STATEMENT

1. Project Number: TUZI-C-01

2. Project Title: Conserve Museum Objects

3. Service-wide Issue(s):

C15 - Need for Conservation Treatment of Museum Objects

4. Problem Statement: The museum collection still at Tuzigoot National Monument, about 500 items, has been on exhibit for about 50 continuous years. Many of the items are organic or repaired archeological items that may be particularly fragile. A Collection Condition Survey, conducted in August of 1988, identified those objects that are in need of conservation treatment.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. Without conservation treatment these items will continue to deteriorate leading to irretrievable loss of primary resources. The park would fail to meet NPS standards.

b. Preservation and Conservation Work by Division of Conservation, Harper's Ferry Center. HFC conservators have the expertise and accommodations to do professional conservation and preservation work for any park in the system. Because all parks compete Service-wide for time and funds for these projects, objects may wait years before receiving attention now needed. In addition, fragile objects would travel a considerable distance placing them in jeopardy and would be in an environment that is different and unfavorable to their preservation.

c. Preservation and Conservation Work Through Contracts With Professional Conservators. There are a few professional conservators in the southwestern area who have experience in working with the materials in the TUZI collection. The travel distance would be minimal and the environment would be relatively the same as at the park.

d. Preservation and Conservation Work by the Conservation Lab, MCR - WACC. The conservators at MCR - WACC have the expertise and accommodations to do professional conservation and preservation work for any park in their service area. Transfer of objects to the Center for conservation work would be conducted under optimal conditions for the safety of the objects. In

addition, environmental conditions at the Center are similar to those at Tuzigoot.

6. Description of the Recommended Project or Activity: Option d. is the recommended solution for this issue. Preservation and conservation of museum collections in their service area is the responsibility of the conservators at MCR - WACC. Artifacts in need of conservation would be prioritized by the Collection Condition Survey and Object Treatment Requests would be submitted by the park to the Regional Curator for approval. Conservators would treat objects following approval of the treatment proposal by the Superintendent and the Regional Curator. A treatment report, including before and after photographs, will be submitted when treated objects are returned to the park.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least eight other projects listed in this plan. These are as follows:

TUZI-C-02 Manage Park Museum Collection
TUZI-C-05 Survey and Inventory Collections for Tuzigoot Objects
TUZI-C-06 Catalog Backlog of Museum Collection
TUZI-C-08 Analyze and Report on Tuzigoot Records and Artifacts
TUZI-C-09 Install Environmental Control, Tuzigoot Museum
TUZI-C-12 Write Collection Management Plan
TUZI-C-17 Establish Exhibit Maintenance
TUZI-C-18 Analyze Existing Security System

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personal Services	\$2,000	\$2,000	\$2,000	\$2,000
Travel and Per Diem	0	0	0	0
Supplies & Materials	500	500	500	500
Publication Costs	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	\$2,500	\$2,500	\$2,500	\$2,500

10. Annual Project Status and Accomplishments: This report will be initiated once final determination is made by WASO on the proper Servicewide format.

PROJECT STATEMENT

1. Project Number: TUZI-C-02
2. Project Title: Manage Park Museum Collection
3. Service-wide Issue(s):

CO9 - Need for Collection Management Plans, Collection Storage Plans, Collection Condition Surveys

4. Problem Statement: Tuzigoot has a museum collection on-site of approximately 500 items; the remainder of the collection is located at the Museum Collections Repository, Western Archeological and Conservation Center (MCR - WACC). These items are on display at the Tuzigoot museum. Primarily archeological, there are a number of ethnographic objects - pottery, basketry, and jewelry - on display.

To maintain these objects, there are a number of actions that need to be accomplished on an annual or more frequent basis: Collection Management Report (form 10-94), Annual Inventory for Museum Property, IPM Monitoring, curatorial housekeeping, curatorial record keeping (accession and catalog records), Scope of Collection Statement review, and environmental recording of all spaces with museum objects.

The park has identified a museum collection manager for the TUZI museum who is responsible for all duties related to the museum collection.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. This would result in non-compliance with NPS-28, Manual for Museums, Museum Handbook, Part II, and Special Directive 80-1 (revised).

b. Management of park collection through contract with a Non-NPS Curator. This action would not be cost-effective. A non-NPS curator may not have the background in NPS standards and regulations. This person could change on a yearly basis leading to a lack of continuity and record keeping.

c. Management of Park Collection Through Use of MCR - WACC Curator. This action would not be cost- or time-effective. The MCR - WACC curator would only be able to come to the park on a specifically scheduled basis. Any emergency or other unscheduled

(accessions) actions would require special trips and additional funding. MCR - WACC might not always send the same staff member leading to a lack of continuity.

d. Management of Park Collection Through Park Staff Member Specifically Assigned Collections Management Duties. This action would ensure an on-site, trained person who would be available as-needed to perform any collections management duties. This alternative would also ensure continuity of work and records.

6. Description of the Recommended Project or Activity: Option d. is the recommended solution for this issue. A park staff member, identified as the museum collections manager, should have these duties identified in his position description and performance standards (critical elements). Proper training, through Curatorial Methods, regional, or MCR - WACC training, must be provided for any staff member working with the collection.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least eight other projects listed in this plan. These are as follows:

TUZI-C-01 Conserve Museum Objects
TUZI-C-05 Survey and Inventory Collections for Tuzigoot Objects
TUZI-C-06 Catalog Backlog of Museum Collection
TUZI-C-08 Analyze and Report on Tuzigoot Records and Artifacts
TUZI-C-08 Install Environmental Control, Tuzigoot Museum
TUZI-C-12 Write Collection Management Plan
TUZI-C-17 Establish Exhibit Maintenance
TUZI-C-18 Analyze Existing Security System

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personal Services	\$2,900	\$2,900	\$2,900	\$2,900
Travel and Per Diem	0	0	0	0
Supplies & Materials	500	500	500	500
Publication Costs	0	0	0	0
Total	\$3,400	\$3,400	\$3,400	\$3,400

10. Annual Project Status and Accomplishments: This report will be initiated once final determination is made by WASO on the proper Servicewide format.

PROJECT STATEMENT

1. Project Number: TUZI-C-03
2. Project Title: Update and Maintain Automated National Catalog System Program
3. Servicewide Issue(s):
C03 - Incomplete Cataloging of Museum Collections (ANCS)
4. Problem Statement: In fall 1987, the Automated National Catalog System (ANCS) was issued to the field from the Curatorial Service Division, WASO. At MCR - WACC, during the inventory project, all previously cataloged items were entered into an ANCS test version. The items remaining at TUZI, about 500 items, have not been entered into any data base. Once the MCR - WACC data bases are transferred to the current ANCS program, the park will receive the data for installation in their data base. As the backlog is cataloged, it will be entered directly into the current data base. As this is completed and reviewed, copies of the data base will be provided to the park. This leaves the items located at the park as well as any future acquisitions to be added to the data base so that all the park museum collection will be on the computer and allow park staff and management to manipulate the data and provide reports on a variety of subjects.
5. Alternative Actions/Solutions and Their Probable Impacts:
 - a. No Action. An incomplete data base will not allow full use of the ANCS program for completion of reports such as the Collection Management Report (form 10-94).
 - b. Monument Staff Catalog Items. Staff will input the data for the 500 items located in the park. The ANCS program can be used with minimal training and the input of 500 records can be accomplished in a relatively short period of time.
6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. The park museum collections manager should be responsible for the input of these records. The purchase of a computer that is available to him would be necessary due to the fact that all park computers are located at the Yavapai-Apache Visitor Center and are heavily overused. The ANCS program requires a great deal of space for the data base as well as space for any indexes that are required

to access data.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least two other projects listed in this plan. These are as follows:

TUZI-C-02 Manage Park Museum Collection
TUZI-C-12 Write Collection Management Plan

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personal Services	\$1,400	\$1,400	\$1,400	\$1,400
Travel and Per Diem	0	0	0	0
Supplies & Materials	0	0	0	0
Publication Costs	0	0	0	0
Total	\$1,400	\$1,400	\$1,400	\$1,400

10. Annual Project Status and Accomplishments: This report will be initiated once final determination is made by WASO on the proper Servicewide format.

Cultural Resources Project Statements: Unfunded Program

The following project statements are a description of the cultural resource protection and information program currently unfunded at Tuzigoot National Monument.

PROJECT STATEMENT

1. Project Number: TUZI-C-04
2. Project Title: Preserve and Restore the Prehistoric Scene
3. Service-wide Issue(s):

C13 - Need for Rehabilitation or Restoration of Historic and Prehistoric Structures, and Cultural Landscapes

4. Problem Statement: Preserve and restore the prehistoric setting and scene immediately to the east and below the 100 room pueblo. This view area includes riparian areas, prehistoric croplands, desert uplands and Tavasci Marsh.

Tavasci Marsh, first identified as a significant Arizona rare type of habitat by the Arizona Academy of Science has also been identified in the National Natural Landmark Theme Study, Biotic Themes, Mojave-Sonoran Desert Region. The Marsh is of importance as a riparian habitat, with an extensive diversity of flora and fauna, and also represents geologic processes and lake formation.

The 60 acre marsh is a key aspect relating to the prehistoric occupation of the area. The marsh is being drained, heavy grazing is occurring, some development exists, a dirt road crosses the middle of the area and the flora and fauna is being adversely altered. The potential exists for extensive modern farming and development of most of the small valley for housing. Extensive development of adjacent lands is occurring for housing.

The 1975 Master Plan addressed the critical area and called for acquisition. The 1984 Land Protection Plan also recognized the critical area and called for acquisition. Discussions have been held with the owner of the property concerning possible exchange for other lands in the Southwest. The 1979, Natural Landmark Theme Study also recommended that Tavasci Marsh should be added to Tuzigoot National Monument.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. This option would fail to provide protection to Tavasci Marsh and adjacent lands. Changing land use patterns in the area will almost guarantee that these lands will be developed for housing and intense recreational pursuits in the near future if no protection is provided.

b. Purchase These Lands for Addition to the Monument. This option would guarantee that this important part of the prehistoric scene at Tuzigoot National Monument could be permanently protected from urban development. This area also has important ecological values as a wetland that should be protected.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. Acquisition of the culturally significant lands including riparian areas, prehistoric croplands, desert uplands and Tavaszi Marsh will provide protection for these lands and better preserve a more complete picture of the prehistoric scene in the Tuzigoot area.

7. Compliance: This project will require an environmental assessment or impact statement under NEPA regulations. Such compliance will be prepared on an individual basis at the time that the project is funded. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least two other projects listed in this plan. These are as follows:

TUZI-N-03 Restoration of Tavaszi Marsh
TUZI-I-04 Examine Old Fields

9. Funding Requirements: The current legislatively mandated acquisition ceiling for Tuzigoot National Monument is \$1,350,000. The cost of purchasing these additional lands has not yet been determined.

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-C-05
2. Project Title: Survey and Inventory Collections for Tuzigoot Objects
3. Service-wide Issue(s):

C09 - Need for Collection Management Plans, Collection Storage Plans, Collection Condition Surveys

4. Problem Statement: There are modern accounts on ruins in the Verde Valley dating from the mid-19th century when the Whipple expedition came through the area. Dr. Edgar Mearns, post surgeon at Camp Verde, provided the first description of Tuzigoot ruins in unpublished notes at the American Museum of Natural History in New York.

The decision to excavate Tuzigoot pueblo grew out of the Depression and a desire for a small local museum in Yavapai County. Under the supervision of Dr. Byron C. Cummings of the University of Arizona, the Yavapai County Chamber of Commerce in Prescott began a program of excavation on a small set of ruins near that town in the summer of 1932 to provide material for an exposition on the county's history in the "Smoki" museum at Prescott. With the completion of this excavation, the archeological committee delegated E.H. Spicer and L.R. Caywood, at the time graduate students at the University of Arizona, to select a large pueblo in the Verde Valley for excavation. The site later known as Tuzigoot was proposed to them by Earl Jackson because it represented a little known phase and locality of prehistoric occupation. The project began on October 31, 1933, with a crew of eight men under Spicer and Caywood, and was paid for by various federal relief agencies (FER and CWA). By June 1, 1934, with additional assistance from Arizona State Museum assistants H.T. Getty and G.C. Baldwin, the excavation and repair of artifacts was completed, display cases made, and the ruin stabilized and partially reconstructed.

Because of the speed of the project, few records were made during the excavation or of the artifacts collected. There apparently was no additional money for the writing and publication of a report of the excavations. According to the archeological overview done by the Museum of Northern Arizona in 1976, there are perhaps four institutions that have or may have collections from Tuzigoot (TUZI, WACC, Panhandle Plains Historical Museum,

and Smoki Museum); it seems likely that there are additional institutions that may have material as well.

Because of the general interest in southwestern archeology and the fact that these ruins were well-known long before establishment as a monument (1939), it is quite likely that there exist archeological collections from Tuzigoot in institutions outside the National Park Service.

In order to study and understand fully the people who built and lived at Tuzigoot, all artifacts and collections from the site need to be studied and compared. Those items collected within the monument following its establishment need to be cataloged into the NPS system and returned.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. This alternative would lead to continued lack of understanding of the Tuzigoot pueblo and, possibly lack of compliance with NPS standards regarding the cataloging and preservation of NPS museum collections.

b. Enlist a Qualified Volunteer to Undertake a Survey of the Most Pertinent Institutions and Longtime Local Families. This effort is needed to determine where artifacts and information related to the ruins and excavations might be located. This would require an individual with diplomatic skills in order to deal with people who may be hostile to the federal government.

c. Hire an Archeologist or a Curator With Archeological Experience to Conduct a Survey of the Most Pertinent Institutions and Longtime Local Families. This effort is needed to determine where artifacts and information related to the ruins and excavations might be located. This person would have the NPS background with regard to guidelines but may not have the entre to some individuals that a non-federal employee might have.

6. Description of the Recommended Project or Activity: Option c. is the recommended solution for this issue. The survey of appropriate institutions should be undertaken by a fully trained professional to determine where collections from the Monument lands are located. These would include those items collected prior to establishment as well as any that have been removed since. Initial work should begin with a letter to all institutions who were active in southwestern archeology prior to 1940. There would be no request for return of any material during this mail inquiry. Following initial contact, those institutions which have or may have material should be contacted and the items should be inspected.

At the same time, longtime local families should be contacted in a non-threatening manner to learn as much about the early explorations and information as possible; this might include family photographs, letters, etc. Every effort should be made to learn if anyone has any artifacts from the ruins; however, every effort should also be made to ensure that there are no feelings of threat from these contacts. The goal should be the gathering of information only.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least five other projects listed in this plan. These are as follows:

- TUZI-C-01 Conserve Museum Objects
- TUZI-C-02 Manage Park Museum Collection
- TUZI-C-03 Update and Maintain Automated National Catalog System Program
- TUZI-C-06 Catalog Backlog of Museum Collection
- TUZI-C-12 Write Collection Management Plan

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Personnel Services	\$28,000	\$13,000	\$ 0
Travel and Per Diem	8,000	4,000	0
Supplies and Materials	0	0	0
Publication Costs	0	1,000	0
Total	\$36,000	\$18,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-C-06

2. Project Title: Catalog Backlog of Museum Collection

3. Service-wide Issue(s):

C03 - Incomplete Cataloging of Museum Collections (ANCS)

4. Problem Statement: Tuzigoot National Monument has a museum collection of 4,850 items, of which only about 500 are curated in the monument. The remaining parts of the collection are located at the Museum Collections Repository - Western Archeological and Conservation Center in Tucson where they are stored, curated, and any needed conservation treatment provided. There is an uncatalogued backlog of about 3000 archeological items that must be cataloged to NPS standards.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. This alternative would lead to non-compliance with NPS guidelines. Lack of proper documentation and accountability for museum objects is documented in reports by the Inspector General and General Accounting Office.

b. Park Staff Catalog Museum Collections. The park staff is currently overworked; in addition, all uncatalogued items are located at MCR - WACC.

c. MCR - WACC Museum Technicians Catalog Museum Collections. Trained technicians and curators, experienced in cataloging such collections, are employed at MCR - WACC.

6. Description of the Recommended Project or Activity: Option c. is the recommended solution for this issue. Museum collections should be cataloged by the curatorial staff at MCR - WACC. This would ensure compliance with NPS guidelines by staff whose job it is to catalog. In addition, MCR - WACC would enter all records onto ANCS database and provide printed catalog records to the National Catalog and the park.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least five other projects listed in this plan. These are as follows:

- TUZI-C-01 Conserve Museum Objects
- TUZI-C-02 Manage Park Museum Collection
- TUZI-C-03 Update and Maintain Automated National Catalog System Program
- TUZI-C-05 Survey and Inventory Collections for Tuzigoot Objects
- TUZI-C-12 Write Collection Management Plan

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>
Personal Services	\$10,000	\$ 0
Travel and Per Diem	500	0
Supplies and Materials	500	0
Total	\$11,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-C-07
2. Project Title: Maintain Stabilized Prehistoric Ruins
3. Service-wide Issue(s):
C12 - Inadequate Preservation Maintenance Programs, Including Stabilization and Cyclic Maintenance

4. Problem Statement: The monument was originally excavated in 1933-1934 under the direction of Louis R. Caywood and Edward H. Spicer. Caywood and Spicer reconstructed all of the rooms in Group IV after this unit had been excavated. Due to the poor quality of the reconstruction and the danger from unstable roofs, seven rooms in this group were rebuilt to conform more closely to their appearance at the time Tuzigoot was abandoned.

Along with the major restoration of the Group IV rooms there were four other extensive post-excavation stabilization projects (which are described in Tuzigoot: An Overview). Stabilization has been an ongoing project since the inception of the monument. Most of the work has consisted of maintenance and periodic small stabilization jobs.

From the late 1970's until now the stabilization of the prehistoric structures was accomplished by a Ruins Stabilization Specialist. The structures are now in a maintainable condition and the impact is low, however to keep these structures in this condition they must be maintained on a cyclic basis.

Structure No. HS-1 Tuzigoot Ruins, is included in the work of this Project Statement.

5. Alternative Actions/Solutions and Their Probable Impacts:
 - a. No Action. Management of the Cultural Resources fails to meet the NPS Organic Act of 1916 and NPS-28 Cultural Resources Management Guidelines. The level of impact on the structures increases from low to moderate within two years.
 - b. Maintain the Structures. This option would ensure that the requirements of the NPS Organic Act of 1916 and NPS-28 will be met. Impacts on the ruins will remain low.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. This action will be accomplished by park maintenance staff. Following an Historic Structure Preservation Guide the maintenance staff will continue to maintain the structures.

The SOAR Ruins Stabilization Specialist will provide assistance for training and difficult maintenance tasks. The Specialist will provide closeout of all work undertaken.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. Under the National Historic Preservation Act of 1966, all undertakings will be reviewed by regional professionals under the XXX Form.

8. Relationships: This project is related to at least one other project listed in this plan. This is as follows:

TUZI-C-14 Prepare Historic Structure Preservation Guide:
Prehistoric Structures

9. Funding Requirements:

This request is for a permanent base increase for Tuzigoot National Monument.

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personal Services	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000
Travel and Per Diem	500	500	500	500
Supplies and Materials	<u>2,500</u>	<u>2,500</u>	<u>2,500</u>	<u>2,500</u>
Total	\$10,000	\$10,000	\$10,000	\$10,000

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-C-08
2. Project Title: Analyze and Report on Tuzigoot Records and Artifacts
3. Service-wide Issue(s):
C08 - Need for Historic Resource Studies and Administrative Histories
4. Problem Statement: The 1932 excavation of Tuzigoot ruin resulted in a large collection of artifacts and records of burials which were only briefly described in the 1935 report by Caywood and Spicer. A re-analysis of this material meeting current standard is needed to update understanding of Tuzigoot site growth, trade, and social status, as basis information for interpretation.
5. Alternative Actions/Solutions and Their Probable Impacts:
 - a. No Action. The only reference for this major excavation will remain the 42-year old summary report and a few reports on other work in the area. This leaves a number of interpretive questions unanswered, or based on outdated research.
 - b. Conduct the Study When Time and Funding From Other Projects Permits. Since no other projects are expected, this is not likely to happen.
 - c. Fund and Conduct this Study. This option would ensure that the project gets done and that the records for the monument are a true and accurate reflection of the facts. Currently, much information on the artifacts recovered during past excavations is unknown to the National Park Service.
6. Description of the Recommended Project or Activity: Option c. is the recommended solution for this issue. Collections and notes will be relocated, as far as possible, and will be re-studied with the goal of publishing more detailed descriptions and analyses that reflect archeological developments over the last 42 years. Objectives for this second study are as follows:
 - a) reconstructing field techniques and observations from notes and photographs;
 - b) re-analyzing burial records to find patterns of internment that reflect status differentiation;
 - c) re-

analyzing and describing ceramics for studies in comparison with other Verde Valley collections; d) re-analysis of ceramics and mineral items that were traded out of the Verde Valley; and e) outlining, as far as possible, the prehistoric construction sequence at Tuzigoot.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM. Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 may be required for this project should any destructive testing be planned.

8. Relationships: This project is related to at least five other projects listed in this plan. These are as follows:

- TUZI-C-01 Conserve Museum Objects
- TUZI-C-02 Manage Park Museum Collection
- TUZI-C-05 Survey and Inventory Collections for Tuzigoot Objects
- TUZI-C-06 Catalog Backlog of Museum Collection
- TUZI-C-12 Write Collection Management Plan

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personal Services	\$15,000	\$15,000	\$ 7,000	\$ 0
Travel and Per Diem	4,000	4,000	2,000	0
Supplies and Materials	1,000	1,000	500	0
Publication Costs	<u>0</u>	<u>0</u>	<u>1,000</u>	<u>0</u>
Total	\$20,000	\$20,000	\$10,500	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-C-09
2. Project Title: Install Environmental Controls for Tuzigoot Museum
3. Service-wide Issue(s):

C16 - Inadequate Storage and Environmental Controls for Museum Objects

4. Problem Statement: The Tuzigoot Museum, a stone masonry structure, was built by the WPA in 1936. At that time the building was located on land owned by the Phelps Dodge Corp., who then deeded the land to the local school district. On July 25, 1939, the area, comprising the ruin, museum, and 43 acres of land, was made a National Monument but no funds for its administration were available. The school board was asked to continue its responsibility and the Phelps Dodge Corp. provided a caretaker.

The standards for museum environment are fairly rigid and must be maintained for the preservation of the collection. The environment of the museum at the present time is placing a great deal of stress on the artifacts. High relative humidity coupled with rapid changes in both relative humidity and temperature are stressful to objects, particularly organic material. In addition, such an environment is conducive to the growth of museum pests. The items on display in the museum are made up of a variety of materials with a great number of the artifacts particularly vulnerable to the changes in environment. The environment in the Tuzigoot museum is currently unsatisfactory for the preservation of museum objects. The recording hygrothermograph located in the museum has recorded excessive changes in temperature, and especially relative humidity, in a 24-hour period.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. This would lead to non-compliance with NPS standards including Special Directive 80-1 (revised). The museum objects would deteriorate due to undue stress and pest infestation.

b. Revamp the Current Environmental Control System. This would provide an environment better able to preserve the collection.

c. Design and Install Climate Control System That Regulates Temperature and Relative Humidity. A complete climate control system would maintain the environment necessary to preserve the museum objects.

6. Description of the Recommended Project or Activity: Option c. is the recommended solution for this issue. A climate control system, specially designed to take into consideration the artifacts on exhibit, the historic structure, and the environment in the museum and the area, should be designed and installed. This system would provide a stable environment necessary for the preservation of the artifacts on exhibit. It should also be sensitive to the needs of the building and historic setting of the museum interior.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. Since this structure may be placed on the National Register of Historic Places in the near future and is currently on the List of Classified Structures, compliance under Section 106 will be required for certain actions. Park staff will consult with the Regional Office prior to beginning any work.

8. Relationships: This project is related to at least two other projects listed in this plan. These are as follows:

TUZI-C-01 Conserve Museum Objects
TUZI-C-02 Manage Park Museum Collection

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
DSC Construction Contract	\$35,000	\$90,000	\$ 5,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-C-10

2. Project Title: Prepare Administrative History

3. Servicewide Issue(s):

C08 - Need for Historic Resource Studies and Administrative Histories

4. Problem Statement: Tuzigoot National Monument has no administrative history. It also needs preparation of a National Register nomination form on its rustic visitor center, including some of its original furnishings. These projects should be combined into an administrative history which includes a chapter on the visitor center that also meets the standards of a historic resource study, along with a historic base map. (Note: Fred Peck's "History of Tuzigoot National Monument" does not meet standards of an administrative history).

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. Impact is failure to comply with NHPA requirements, management with lack of understanding of past problems and their solution, lack of "institutional memory:.

b. Fund and Accomplish Study. Will meet WASO directive on administrative histories and will accomplish compliance with National Historic Preservation Act.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. Prepare an administrative history of Tuzigoot National Monument, along with a chapter that constitutes a historic resource study of the visitor center, accompanied by National Register nomination of the visitor center and its original furnishings, and a historic base map.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least one other project listed in this plan. This is as follows:

TUZI-C-11 Update/Correct the Cultural Resources Bibliography

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Research Contract	\$20,000	\$ 5,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-C-11
2. Project Title: Update/Correct the Cultural Resources Bibliography
3. Service-wide Issue(s):
C26 - Other (need update of CRBIB)
4. Problem Statement: Tuzigoot National Monument has 15 cultural resources bibliography (CRBIB) entries. A quick search of the monument library reveals at least 12 additional titles that need to be added to the CRBIB, and there are believed to be many more not only in the monument library, but in the Regional Office library and in the library of the Western Archeological and Conservation Center. As it stands, the CRBIB is minimally useful because it is so incomplete. At present, it does not include the three most important studies of Tuzigoot.
5. Alternative Actions/Solutions and Their Probable Impacts:
 - a. No Action. The impact of this option will be the continued inadequacy of CRBIB. This creates a condition wherein the potential for repetition of research previously conducted remains high.
 - b. Fund and Accomplish Required Update. This update is required by WASO and the Western Region operations evaluation guidelines.
6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. This project will first check the accuracy of 15 existing CRBIB entries, then, based on a search of the monument library files, the Western Regional Office library, and the Western Archeological and Conservation Center Library, all relevant entries found will be entered into the CRBIB computer program.
7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least two other projects listed in this plan. These are as follows:

TUZI-C-08 Analyze and Report on Tuzigoot Records and Artifacts
TUZI-C-10 Prepare Administrative History

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>
Personal Services	\$4,000	\$ 0
Travel and Per Diem	750	0
Library Services	<u>250</u>	<u>0</u>
Total	\$5,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-C-12

2. Project Title: Write Collection Management Plan

3. Service-wide Issue(s):

C09 - Need for Collection Management Plans, Collection Storage Plans, Collection Condition Surveys

4. Problem Statement: Management of the collection of archeological, ethnological, and historical material is an on-going concern. The museum collection currently located at Tuzigoot National Monument numbers approximately 500 items; the remaining items are located at MCR - WACC. The park staff is responsible for the preservation of the collection in perpetuity. To assist in this work, a Collection Management Plan, required by NPS-28, needs to be written. This document would include a brief history of the collection and an overview of the present collection; a current Scope of Collection Statement with recommended changes to the statement; current status and recommendations regarding museum records; current status (environment and maintenance) of museum exhibits with recommendations for improvement; current status with recommendations for museum security and fire detection/protection; current status with recommendations for museum staffing; and future planning/sources of funding. With this plan, the park will be in compliance with the standards.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. The park would not be in compliance with NPS-28. The staff has managed the collection in accordance with NPS standards to the best of their ability. This has been accomplished by sending much of the collection to MCR - WACC and by properly cataloging and curating the items on display in the museum.

b. Collection Management Plan Written by Park Staff. An outside team of curatorial experts is recommended for writing such plans. This allows for fresh eyes to view the park, collection, and its problems and make recommendations.

c. Collection Management Plan Written by a Team From the Curatorial Services Division, WASO. These staff are mainly responsible for the production of such plans. This alternative

is not cost-effective do to the fact that the size of the collection located at MOCA and the amount of activity related to them do not, at this time, require the full-blown plan outlined in NPS-28.

d. Collection Management Plan Written by a Curator From a Park, MCR - WACC, or the Regional Office. This alternative is the most cost-effective while providing the outside expertise the park can draw on over the long run.

6. Description of the Recommended Project or Activity: Option d. is the recommended solution for this issue. This plan will be in the form of an expanded trip report and will include the sections listed above. Since the park has no collections in storage, it will not need to have a storage section but will include an overview of the collections stored at MCR - WACC and any other repositories, if appropriate.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least seven other projects listed in this plan. These are as follows:

TUZI-C-01 Conserve Museum Objects
TUZI-C-02 Manage Park Museum Collection
TUZI-C-05 Survey and Inventory Collections for Tuzigoot Objects
TUZI-C-06 Catalog Backlog of Museum Collection
TUZI-C-08 Analyze and Report on Tuzigoot Records and Artifacts
TUZI-C-09 Install Environmental Control, Tuzigoot Museum
TUZI-C-17 Establish Exhibit Maintenance

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>
Personal Services	\$4,000	\$ 0
Travel and Per Diem	500	0
Publication Costs	<u>300</u>	<u>0</u>
Total	\$4,800	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-C-13
2. Project Title: Prepare Historic Structure Preservation Guide: Historic Structures
3. Service-wide Issue(s):
C06 - Need for Historic Structure Preservation Guides
4. Problem Statement: There is a great need to provide direction for the preservation maintenance activities on these structures. It is imperative to provide maintenance personnel with a reference for programming, continued housekeeping, routine, and cyclic preservation maintenance. The HSPG will provide, as well, the necessary information for orderly, timely, and proper inspection and maintenance.

Specific key points that must be monitored in an annual inspection will be; impacting vegetation around the building base, delaminating sandstone, and water drainage. These are not the only points to be monitored, however, they are the elements that present the greatest areas of deterioration.

The impact on these structures is from visitation and normal daily use by park personnel. The level of impact is low for its effects are not a direct threat to visitor or staff safety. However, directing the maintenance activities on these structures is considered to be of the utmost importance to insure that the present maintainable condition of the structures is retained without loss of historic fabric or details.

The resources to be included in this HSPG are as follows:

Structure No.1 Museum and Headquarters Building
Structure No.2 Tool Storage House

5. Alternative Actions/Solutions and Their Probable Impacts:
 - a. No Action. Management of the Cultural Resources fails to meet the NPS Organic Act of 1916 and NPS-28 Cultural Resources Management Guidelines. The level of impact on the structures increases from low to moderate within two years.
 - b. Establish an HSPG for the Structures. The requirements of the NPS Organic Act of 1916 and NPS-28 will be met. Maintenance and Preservation activities on the structures will follow a

prescribed schedule and be accomplished along parameters that will insure the impact will remain low.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. A task directive, outlining the requirements and goals of the project, will be prepared by the Western Region Division of Park Historic Preservation.

The HSPG will be a working document, produced in loose-leaf format with the pages dated to facilitate updating without reprinting the entire document. The completed document will contain three major sections: instructions, schedules, and reference materials.

Personnel required for the compilation of the HSPG will be park maintenance personnel, a historical architect, a curator, and a historian. The following procedures for developing an HSPG will be used:

- 1) A historical architect, and a curator, and a historian will assemble basic inspection and preservation instructions, as well as specifications, and prepare or modify as-built drawings and other initial pertinent reference material.
- 2) Copies of an initial draft of the above documents will be forwarded to the area, Southern Arizona Group offices, and region for review and shortly thereafter the specialists and area and regional office staff will meet at the site to suggest additions, changes, or deletions.
- 3) Based on the initial draft, the area and SOAR staff will draft a cyclic preservation maintenance schedule to be reviewed by the specialists during the above site visit.
- 4) Based on the revised draft of the guide resulting from the above meeting, the document will be completed and submitted for area concurrence and regional approval.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. Under NHPA, all undertakings that will effect cultural resources will be reviewed for Compliance with Section 106 as the details of those undertakings become available.

8. Relationships: This project is related to at least two other projects listed in this plan. These are as follows:

- TUZI-I-01 Natural and Cultural Resources Management and Administration
- TUZI-C-16 Maintain Historic Structures

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>
DSC Contract -	\$30,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-C-14
2. Project Title: Prepare Historic Structure Preservation Guide: Prehistoric Structures

3. Service-wide Issue(s):

C06 - Need for Historic Structure Preservation Guides

4. Problem Statement: Until late in 1987 the prehistoric structures of Tuzigoot were maintained by a Ruins Stabilization Specialist operating out of the Western Archeology and Conservation Center. The Specialist provided preservation and stabilization of prehistoric ruins throughout National Parks in both the Western and Southwest Regions. His knowledge of preservation and stabilization, gathered through years of experience, served as the Preservation Guide for work on these structures.

There is a great need to provide direction for the preservation maintenance activities on the prehistoric structures of the area. The structures are now in a maintainable condition. However, it is imperative to provide maintenance personnel and stabilization teams with a reference for programming, continued housekeeping, routine, and cyclic preservation maintenance. The HSPG will provide, as well, the necessary information for orderly, timely, and proper inspection and maintenance.

The impact on these structures is from visitation and normal erosion. The level of impact is low for its effects are not a direct threat to visitor or staff safety. However, directing the maintenance activities on these structures is considered to be of the utmost importance to insure that the present maintainable condition of the structures is retained without loss of historic fabric or details. These prehistoric resources are of National Significance and are the prime resource for which the area was established.

The resources to be included in this HSPG are as follows:

Structure No. HS-1 Tuzigoot Ruins

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. Management of the Cultural Resources fails to meet the NPS Organic Act of 1916 and NPS-28 Cultural Resources Management Guidelines. The level of impact on the structures increases from low to moderate within two years.

b. Establish an HSPG for the Structures. The requirements of the NPS Organic Act of 1916 and NPS-28 will be met. Maintenance and Preservation activities on the structures will follow a prescribed schedule and be accomplished along parameters that will insure the impact will remain low.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. A task directive, outlining the requirements and goals of the project, will be prepared by the Western Region Division of Park Historic Preservation.

The HSPG will be a working document, produced in loose-leaf format with the pages dated to facilitate updating without reprinting the entire document. The completed document will contain three major sections: instructions, schedules, and reference materials.

Personnel required for the compilation of the HSPG will be park maintenance personnel, a ruins stabilization specialist, a historical architect, an anthropologist, and a historian. The following procedures for developing an HSPG will be used:

- 1) A ruins stabilization specialist, a historical architect, and an anthropologist, will assemble basic inspection and preservation instructions, as well as specifications, and prepare or modify as-built drawings and other initial pertinent reference material;
- 2) Copies of an initial draft of the above documents will be forwarded to the area, Southern Arizona Group offices, and region for review and shortly thereafter the specialists and area and regional office staff will meet at the site to suggest additions, changes, or deletions.
- 3) Based on the initial draft, the ruins stabilization specialist will draft a cyclic preservation maintenance schedule to be reviewed by the area and region during the above site visit.
- 4) Based on the revised draft of the guide resulting from the above meeting, the document will be completed and submitted for area concurrence and regional approval.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. Under NHPA, all undertakings that will effect cultural resources will be reviewed for Compliance with Section 106 as the details of those undertakings become available.

8. Relationships: This project is related to at least one other project listed in this plan. This is as follows:

TUZI-I-01 Natural and Cultural Resources Management and Administration

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>
Personnel Services	\$12,000	\$ 0
Travel and Per Diem	1,000	0
Publication Costs	<u>500</u>	<u>0</u>
Total	\$13,500	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-C-15

2. Project Title: Obtain Historic Photographs of Tuzigoot

3. Service-wide Issue(s):

C10 - Need for Specialized Studies for Unique or Complex Management Issues

4. Problem Statement: No systematic search of libraries, historical societies, museums, university anthropology and archeology departments or other relevant depositories to obtain copies of early historic photos of ruins, especially 19th century photographs, has ever been done. Photographs may show portions of ruins now collapsed, missing or vandalized, and structural details and conditions now lost.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. This option will allow essential historic data to remain unknown to monument staff.

b. Accomplish Research. This option will ensure that data contained in historic photographs of Tuzigoot National Monument will be made available to the National Park Service before they are lost. Much important information is likely contained in these photographs that are currently unknown to the Service.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. Search libraries, historical societies, museums, university archeology and anthropology departments and other relevant depositories of historic photos for photographs made before 1941 of prehistoric ruins in Tuzigoot National Monument, and acquire large format (4x5") copy negatives where possible and/or 8x10 prints (preferably on non-resin paper) of any views not already in Park files or other NPS repositories. Supplement with brief memorandum of depositories and collection searched, and any known but not searched. Photographs should be preserved in permanent park collection or in Western Archeological and Conservation Center.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least one other project listed in this plan. This is as follows:

TUZI-C-14 Prepare Historic Structure Preservation Guide:
Prehistoric Structures

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>
Personal Services	\$15,000	\$ 0
Travel and Per Diem	4,000	0
Supplies and Materials	0	0
Photo Reproduction Costs	<u>2,000</u>	<u>0</u>
Total	\$21,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-C-16
2. Project Title: Maintain Historic Structures
3. Service-wide Issue(s):

C13 - Need for Rehabilitation or Restoration of Historic and Prehistoric Structures, and Cultural Landscapes

4. Problem Statement: The existing program for maintenance of historic structures at Tuzigoot National Monument has resulted in buildings that are in a maintainable condition. However, cyclic maintenance must be performed on these structures to keep the impact from normal daily use at a low level.

The cyclic maintenance of these stone structures requires more attentive and specialized work than does that of the other area structures. The sandstone walls are constructed with stone grain laid in random directions which makes them extremely susceptible to deterioration from water. Cyclic inspections will be required to insure that water and other deteriorating elements are discovered before problems develop. After inspection the maintenance work must be performed according to an approved Historic Structures Preservation Guide.

The structures to be included in this work are as follows:

Structure No. - 1 Museum and Headquarters Building
Structure No. - 2 Tool Storage House

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. Management of the cultural resources fails to meet the NPS Organic Act of 1916 and NPS-28 Cultural Resources Management Guidelines. The level of impact on the structures increases from low to moderate within two years.

b. Maintain the Structures. The requirements of the NPS Organic Act of 1916 and NPS-28 will be met. The impacts to the structures will remain low.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. Following instructions in the Historic Structure Preservation Guide, the maintenance staff will continue to maintain the structures.

The SOAR Ruins Stabilization Specialist will provide assistance for training and difficult maintenance tasks. The specialist will provide closeout of all work undertaken.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. Under NHPA, all undertakings will be reviewed by regional professionals under the XXX Form.

8. Relationships: This project is related to at least one other project listed in this plan. This is as follows:

TUZI-C-14 Prepare Historic Structure Preservation Guide:
Prehistoric Structures

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>
Personal Services	\$15,000	\$ 0
Travel and Per Diem	500	0
Supplies and Materials	2,500	0
Publication Costs	0	0
Total	\$18,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-C-17

2. Project Title: Establish Exhibit Maintenance

3. Service-wide Issue(s):

C12 - Inadequate Preservation Maintenance Programs, Including Stabilization and Cyclic Maintenance

4. Problem Statement: The exhibits at the Tuzigoot museum were designed and installed as part of the federal work program that designed and built the museum building. They are about 50 years old but are excellent exhibits and good examples of the work done by the National Park Service staff. All exhibits need work from time to time to maintain them in good order. This includes installation of new photographs, cleaning of exhibit panels and cases, replacement of worn-out or damaged equipment, and, occasionally, the replacement of labels due to former inaccuracies or new research.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. The current fading and damaged photographs and other exhibit media would continue to deteriorate and distract from the exhibits. This would not meet NPS standards for exhibits.

b. Establish Program of Exhibit Maintenance. This should include replacement of damaged or worn material and cleaning of all exhibits as necessary. This would ensure that the exhibits would meet all NPS standards and would convey correct information to the public.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. The establishment of a program for exhibit maintenance to replace or clean any exhibit that is worn or incorrect is recommended. This program would annually inspect all exhibits and maintain a prioritized list of needed work. Work would be accomplished as needed to clean, upgrade, and/or replace any exhibit or part of an exhibit that is in need of such due to fading, damage, or inaccurate information. The maintenance of the Tuzigoot exhibits, however, are to be closely monitored to ensure that they only maintain the exhibits and not do total redesign of them.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA requires compliance under Section 106 (XXX form) for certain actions because these exhibits may soon be placed on the National Register of Historic Places. Park staff should consult with the Regional Office prior to beginning any work.

8. Relationships: This project is related to at least two other projects listed in this plan. These are as follows:

- TUZI-C-02 Manage Park Museum Collection
- TUZI-C-12 Write Collection Management Plan

9. Funding Requirements:

This request is for a permanent base increase for Tuzigoot National Monument.

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personal Services	\$3,000	\$3,000	\$3,000	\$3,000
Travel and Per Diem	500	500	500	500
Supplies & Materials	500	500	500	500
Publication Costs	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	\$4,000	\$4,000	\$4,000	\$4,000

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

PROJECT STATEMENT

1. Project Number: TUZI-C-18
2. Project Title: Analyze Existing Security System
3. Servicewide Issue(s):
C20 - Inadequate Security (looting, vandalism, graffiti, arson, fire and burglary systems)
4. Problem Statement: The Tuzigoot museum currently has an older intrusion alarm system activated when the park is closed to the public; this system dials park staff to notify them of a breach. The staff, some of whom live in Cottonwood (about 5 miles distance), then contact the local police as necessary. The collections on exhibit are scientifically valuable, however, they are also extremely popular as collectors items with high monetary value as well. Daytime security is based upon the park ranger/interpreter at the information desk having an excellent and unimpeded view of the museum.
5. Alternative Actions/Solutions and Their Probable Impacts:
 - a. No Action. The exhibited artifacts will remain vulnerable to theft or damage. The park would not be in compliance with Special Directive 80-1 (revised).
 - b. Survey the Current Security System and Evaluate Its Effectiveness. If additional and/or different systems are needed complete design and specifications, including cost estimate, for implementation. Special Directive 80-1 (revised) requires that all systems be evaluated annually and upgraded as needed.
6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. The security system currently installed should be evaluated and systems should be designed, if necessary, for the museum. Careful thought should be given to the system as integrated with local police or other security companies.

This system review and design should also integrate a fire detection system that includes local alarms and fire department notification.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of the Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is related to at least two other projects listed in this plan. These are as follows:

TUZI-C-02 Manage Park Museum Collection
TUZI-C-12 Write Collection Management Plan

9. Funding Requirements:

	<u>Year 1</u>	<u>Year 2</u>
Personal Services	\$ 5,000	\$ 0
Travel and Per Diem	800	0
Capital Equipment	10,000	0
Supplies and Materials	0	0
Publication Costs	0	0
Total	\$15,000	\$ 0

10. Annual Project Status and Accomplishments: This report will be initiated once action begins on this project.

Integrated Resources Project Statements: Funded Program

The following project statements are a description of the integrated resource protection and information program currently funded at Tuzigoot National Monument.

PROJECT STATEMENT

1. Project Number: TUZI-I-01

2. Project Title: Natural Resources Management and Administration

3. Service-wide Issue(s):

N24 - Other Issues (Administration of Program)
C24 - Insufficient Professional Staff

4. Problem Statement: This project consists of the planning and supervisory activities of monument staff in conducting ongoing natural and cultural resources management activities in the area. Considering the small staff available to perform resources management functions at Tuzigoot National Monument, administrative functions consume a large percentage of the allotted time. Hiring seasonals, supervising project teams, preparing funding justifications, preparing activity plans, purchasing supplies, etc. are all examples of some of the administrative functions performed.

5. Alternative Actions/Solutions and Their Probable Impacts:

a. No Action. Continue functioning as at present, with the same staffing and funding level, and with the same level of accomplishment as at present. This alternative maintains the status quo, but this has clearly been shown to be inadequate to properly manage both the cultural and natural resources from a substantial knowledge base and in a timely fashion.

b. Add Additional Staff and Funding. Add additional funding and a resources management specialist with exclusive duties in the professional resources management arena. It is estimated that \$30,000 per year in project funds are needed to adequately perform the research and resources management activities called for in this plan.

6. Description of the Recommended Project or Activity: Option b. is the recommended solution for this issue. It is further recommended that the resources management position be shared between Tuzigoot and Montezuma Castle National Monuments. Each monument should have its own pool of support funds however that is exclusively for activities within that monument.

7. Compliance: This project is categorically excluded from NEPA compliance, Departmental Categorical Exclusions, 516 DM, Chapter 2, Appendices 1 and 7, U.S. Department of Interior. NHPA compliance under Section 106 is likewise not required for this project.

8. Relationships: This project is the administrative foundation for all resources management activities in the monument. It is therefore related to every such function occurring or planned.

9. Funding Allocation:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Personal Services	\$3,000	\$3,000	\$3,000	\$3,000
Travel and Per Diem	0	0	0	0
Supplies and Materials	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	\$3,000	\$3,000	\$3,000	\$3,000

10. Annual Project Status and Accomplishments: This report will be initiated once final determination is made by WASO on the proper Servicewide format.