Final Draft Historic Preservation Plan for Cultural Resources Affected by Glen Canyon Dam Operations

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U.S. Department of the Interior
Bureau of Reclamation
Upper Colorado Region

and

National Park Service
Glen Canyon National Recreation Area
Grand Canyon National Park

With contributions from the
Havasupai Tribe, Hopi Tribe,
Hualapai Tribe, Navajo Nation,
San Juan Southern Paiute Tribe,
Southern Paiute Consortium,
and Zuni Pueblo

Acronyms and Abbreviations

AIRFA	American Indian Religious Freedom Act
AMP	Adaptive Management Program
AMWG	Adaptive Management Work Group
APE	Area of potential effects
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CRSP	Colorado River Storage Project
EIS	Environmental Impact Statement
GCDEIS	Glen Canyon Dam Environmental Impact Statement
GCES	Glen Canyon Environmental Studies
GCMRC	Grand Canyon Monitoring and Research Center
GCPA	Grand Canyon Protection Act
GIS	Geographic information system
GLCA	Glen Canyon National Recreation Area
GRCA	Grand Canyon National Park
HPP	Historic Preservation Plan
MRAP	Monitoring and Remedial Action Plan
NAGPRA	Native American Graves Protection and Repatriation Act
National Register	National Register of Historic Places
NHPA	National Historic Preservation Act
NPS	National Park Service
PA	Programmatic Agreement on Cultural Resources
P.L.	Public Law
Reclamation	Bureau of Reclamation
ROD	Record of Decision
SHPO	State Historic Preservation Officer
TCP	Traditional cultural property

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Executive Summary and Management Plan

This document provides the direction for management of cultural resources along the river corridor from Glen Canyon Dam to Pearce Ferry in Glen Canyon National Recreation Area and Grand Canyon National Park. The river corridor, as defined here, includes downstream areas along the Colorado River that are affected by the operations of Glen Canyon Dam. According to Section 106 of the National Historic Preservation Act, the Upper Colorado Region of the Bureau of Reclamation is responsible for project-oriented impacts to cultural resources. The National Park Service is responsible for long-term management of those resources under Section 110 of the same Act. As signatories to the Programmatic Agreement on Cultural Resources, tribal groups are responsible for overseeing the management of traditional cultural properties and places of religious significance. The Historic Preservation Plan describes the extent of these responsibilities and the specific ways that cultural resources will be managed in order to fulfill National Historic Preservation Act requirements as specified in the Programmatic Agreement on Cultural Resources on Glen Canyon Dam Operations.

CHAPTER I

Introduction

OVERVIEW AND RATIONALE FOR PROGRAM

Glen Canyon Dam was completed by the Bureau of Reclamation (Reclamation) in 1963 as a feature of the Colorado River Storage Project (CRSP). The underlying project purposes are defined by Section 1 of the Colorado River Storage Project Act of 1956, which authorized the Secretary of the Interior to construct, operate, and maintain Glen Canyon Dam

> *. . . for the purpose, among others, of regulating the flow of the Colorado River, storing water for beneficial consumptive use, making it possible for the states of the Upper Basin to utilize, consistently with the provisions of the Colorado River Compact, the apportionments made to and among them in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, providing for the reclamation of arid and semiarid land, for the control of floods, and for the generation of hydroelectric power, as an incident of the foregoing purposes . . .*

Given that Glen Canyon Dam was completed prior to enactment of the National Environmental Policy Act, no Environmental Impact Statement (EIS) was filed regarding construction or operation of the dam.

Although National Environmental Policy Act compliance was not required for the initial construction of Glen Canyon Dam, cultural resource compliance laws were in place during its construction. Salvage archeology of numerous sites was conducted in and around the former Glen Canyon prior to completion of the dam. The work was conducted under contract with the Museum of Northern Arizona and the University of Utah in the late 1950s and early 1960s. The materials from these excavations are curated at those institutions.

Of importance to this discussion is the Reservoir Salvage Act of 1960 (Public Law (P.L.) 86-523), later amended into the Archeological and Historic Preservation Act of 1974 (P.L. 93-291). Initial salvage archeology of Glen Canyon was undertaken using the authority provided to the National Park Service (NPS) under the Historic Sites Act (P.L. 74-292). Later work was accomplished using the authority provided by the Reservoir Salvage Act and the Archeological and Historic Preservation Act which provided for the preservation of historical and archeological data which might otherwise be lost as a result of the construction of a dam. This includes loss or destruction as a result of flooding, the building of access roads, the erection of workmen's communities, the relocation of railroads and highways, and other alteration of the terrain caused by the construction of a dam or any federal construction project or federally-licensed activity or program.

In addition to the direction provided by the Reservoir Salvage Act and the Archeological and Historic Preservation Act, federal agencies are mandated to consider the effects of their activities upon historic properties as dictated in the National Historic Preservation Act (NHPA) (P.L. 89-665), as amended in 1992. Direction for implementation of this Act is found in 36 Code of Federal Regulations (CFR), Part 800, which defines a federal undertaking as any

> *. . . project, activity, or program that can result in changes in the character or use of historic properties, if any such properties are located in the area of potential effects. Undertakings include new and continuing projects, activities, or programs and any of their elements not previously considered under Section 106.*

While cultural resource preservation laws mandate protection of cultural resources on federal lands potentially impacted by federal undertakings, additional laws have authority when issues pertain to the Colorado River. Referred to as the "Law of the River," these authorities represent a collection of federal and state statutes, compacts, court decisions and decrees, federal contracts, a treaty with Mexico, and formally determined long-range operating criteria which define the operation and management of the Colorado River.

The CRSP authorized the construction of Glen Canyon Dam and related facilities for the purposes of flow regulation, water storage for beneficial consumptive use, irrigation, and, as incident to the other purposes, hydroelectric power generation. Even though power production was incidental to other purposes, the powerplant at Glen Canyon Dam has been used primarily for generating power during high demand periods, a method of generation referred to as "peaking power." The daily fluctuating releases associated with peaking power operations have caused concern among federal, state, and tribal resource management agencies; fishing and rafting interests; and environmental groups concerned about detrimental effects on downstream cultural resources, vegetation, wildlife, and other river resources, including endangered species.

In response to these concerns and a proposed uprating and rewinding of the generators at Glen Canyon Dam, Reclamation initiated the Glen Canyon Environmental Studies (GCES) in 1982 to evaluate the effects of low and fluctuating flows caused by the operation of Glen Canyon Dam on downstream resources. Shortly after the initiation of research associated with the GCES, Glen Canyon Dam began spilling water, with a maximum flow of 93,000 cubic feet per second (cfs) achieved in July of 1983. Water releases above powerplant capacity were common over the next four years, with detrimental impacts documented to many of the downstream resources. High releases were the result of unusually high snowpack in the upper basin, confounded by late winter storms and the resultant runoff into an already full reservoir.

Public concerns about possible increases in peaking power generation at Glen Canyon Dam continued to be expressed. The uprate and rewind of powerplant generators was completed in 1987. Reclamation agreed not to use the increased generating capacity until completing additional studies of impacts on downstream resources from dam operations. Maximum peak releases were limited to 31,500 cfs, even though the generators have the capacity of releasing 33,200 cfs because of the uprate and rewind.

On July 27, 1989, public concern and scientific documentation of the detrimental effects of Glen Canyon Dam operations resulted in former Secretary of the Interior Manuel Lujan directing Reclamation to prepare a full EIS on the operations of Glen Canyon Dam. The purpose of the EIS was to determine specific options that could be implemented to minimize—consistent with law—adverse impacts on the downstream environmental and cultural resources and Native American interests in Glen and Grand Canyons.

In addition to the evaluation called for by the EIS, Congress passed the Grand Canyon Protection Act (GCPA) (P.L. 102-575) on October 30, 1992. Section 1802(a) of the Act requires the Secretary of the Interior to

> *. . . operate Glen Canyon Dam in accordance with the additional criteria and operating plans specified in Section 1804 and exercise other authorities under existing law in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources and visitor use.*

In accordance with Section 1804(a) of the Act, Reclamation completed the final Glen Canyon Dam Environmental Impact Statement (GCDEIS) and filed it with the Environmental Protection Agency on March 21, 1995.

Another component of the GCPA, Section 1805, "Long-Term Monitoring," identifies the need for both long-term monitoring and any necessary research and studies to determine the effects of dam operations upon the natural, recreational, and cultural resources.

The Colorado River is a highly complex and dynamic system affected by variables and conditions outside the parameters of dam operations. These variables and conditions were significantly altered by the completion of the dam. Without the influx of sediment, seasonally variable water temperatures, and yearly cleansing floods, the river system can never function as it had before the dam was built. In recognition of the changed river system and the ability Reclamation has to manage flow regimes from Glen Canyon Dam, the Secretary of the Interior is authorized to implement a program of research and monitoring related to Glen Canyon Dam operations to ensure that the dam is operated as stated in Section 1802(a), ". . . to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established."

MONITORING PHILOSOPHY FOR GLEN CANYON DAM OPERATIONS AND FOR RESOURCES OF THE GRAND CANYON

In order to fulfill the requirements of Section 1805 of the GCPA, the final GCDEIS includes a commitment for long-term research and monitoring through a program called the Adaptive Management Program (AMP). Many of the resources considered by the GCES program for long-term monitoring are ecosystem related, and cultural resources are identified as a long-term program

need. As discussed in the GCDEIS, the long-term monitoring and research program will focus on defining a balance between the extremes of (1) very restricted monitoring which recognizes the impacts of scientific study on the essence of what Grand Canyon means to most humans, and (2) full measurement of all ecosystem attributes predicated on a belief that an unmeasured parameter might be critical at a later time (Reclamation 1995).

Details of the long-term monitoring and research program and adaptive management can be found in the GCDEIS and accompanying supporting documents. Of relevance to this discussion are the specific monitoring requirements for cultural resources based upon NHPA mandates for federal undertakings which will adversely affect historic properties.

For the purposes of this project, the federal agencies, Arizona State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation, and the participating tribes have agreed to a finding of no adverse effect contingent upon the implementation of a long-term monitoring and remedial action program which is described in this Historic Preservation Plan (HPP).

AREA OF POTENTIAL EFFECTS OF THE HISTORIC PRESERVATION PLAN

Considerable discussion has occurred related to the definition of the area of potential effects (APE) for dam operations. Cultural resources are affected by agents other than direct impact from Glen Canyon Dam water releases. Pre-dam river terraces form the substrate for most cultural resources. These terraces are directly affected by both river flow and sediment depletion caused by the emplacement of Glen Canyon Dam.

For the purposes of this program, the lateral extent of the monitoring effort is defined by the extent of processes and conditions influenced by dam discharges and pre-dam river flows. The relevant flow related to lateral extent is the maximum pre-dam flood, estimated to be approximately between 220,000 to 300,000 cfs. Because this proposed monitoring program is long term in scope, the maximum discharge considered must reflect all potential operational scenarios. Although the maximum release from Glen Canyon Dam is expected never to exceed 180,000 cfs, the dam is capable of releasing 256,000 cfs (Reclamation 1995:8). Therefore, for the purposes of impact evaluation for Section 106 of the NHPA, all resources located below the lateral extent of maximum possible flow from Glen Canyon Dam, estimated to be 256,000 cfs (Reclamation 1995), were included in the HPP.

The linear extent of potential effect to cultural resources is the Colorado River corridor between Glen Canyon Dam and Lake Mead reservoir. This area is approximately 280 river miles long, with approximately 255 miles representing the free-flowing river from Glen Canyon Dam to the slack water created by Lake Mead at Separation Canyon. River elevation between Separation Canyon (river mile 240) and Lake Mead is primarily controlled by the operations of Hoover Dam. Limited examination of cultural resources in this area is included within the HPP program, given the effects of flooding, changes in the pre-dam sediment regime, and equalization flows.

SUMMARY OF IMPACTS

With the closure of Glen Canyon Dam in 1963, the pattern of deposition, erosion, and flooding on the Colorado River through Glen and Grand Canyons was changed forever. As a result, general loss of river-deposited terraces has occurred. Cultural resources once protected by sandbars and terraces have become increasingly exposed to erosion by the river and by rainfall-induced terrace erosion.

The initial impacts on cultural resources began with the construction of Glen Canyon Dam and the resulting change in the amount and distribution of sediment. The preservation of cultural resources depends on the terraces that have formed along the river corridor. Without a mechanism for sediment augmentation and re-deposition to pre-dam terrace levels, dam operations will continue to negatively impact cultural resources. Given that none of the GCDEIS alternatives alter the basic change in post-dam sediment input to the system, it is expected that dam-related impacts to cultural resources will continue. These impacts are permanent, and the damage is irreversible. However, the rate at which impacts occur could be affected by alternative operations, principally through flood frequency reduction measures and special flows intended to redistribute and deposit sediment throughout the system.

The post-dam river cannot rebuild high terraces, resulting in more cultural resource erosion than occurred in the pre-dam environment. Although the flood flows from 1983-1986 caused direct erosion to some terraces, extreme rainfall conditions between 1978-1985 also accelerated the rate of erosion through the pre-dam terraces, resulting in erosion of cultural resources. Because the dam traps sediment and reduces floods, little or no sediment is deposited at the mouths of small ephemeral tributary streams, which compounds the situation. Only low elevation sediment deposits can be replenished in the post-dam environment. Large sediment-laden floods may rebuild the bases of high terraces at most locations, but may erode terraces at other locations.

The analysis of impacts is based on our present understanding of changes to the stability and integrity of cultural resources known to have occurred as a result of Glen Canyon Dam. Some impacts are direct while others are indirect.

The influence of dam operations on a traditional cultural property (TCP) is based on information provided by ethnographic research and knowledge shared by Indian tribes known to have contemporary use and a history of ancestral use of the Grand Canyon. "A traditional cultural property . . . can be defined generally as one that is eligible for inclusion in the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history and (b) are important in maintaining the continuing cultural identity of the community" (Parker and King 1992). TCPs may be archeological sites, river confluences, geologic formations, mineral collecting locations, or specific locations such as mountains. TCPs may also include riparian vegetation and wildlife as well as cultural resources. The impacts on these resources are also of concern.

Some impacts identified as being caused by Glen Canyon Dam are considered beneficial to certain interest groups and tribes. For example, post-dam changes in the riparian ecosystem within Grand Canyon have favored growth of certain vegetation types, while other vegetation is thought to be declining. The net effects of these changes in riparian vegetation are dynamic; however, some of the

traditional resources (willows, giant reeds, yellow warblers, yellow throats, and other plants and riparian birds) have clearly increased since construction of the dam.

Impacts to cultural resources will continue under all operational scenarios for Glen Canyon Dam (Reclamation 1995). These impacts are cumulative, and result from the significant environmental changes which have occurred to the river system due to both the existence and operation of Glen Canyon Dam. The HPP provides guidance for fulfilling NHPA requirements as specified in the Programmatic Agreement on Cultural Resources (PA) for Glen Canyon Dam Operations.

ARTICULATION WITH THE PROGRAMMATIC AGREEMENT ON CULTURAL RESOURCES AND THE MONITORING AND REMEDIAL ACTION PLAN

In order to meet Reclamation's NHPA Section 106 responsibilities, as outlined in 36 CFR 800, and the NPS Section 110 responsibilities, both agencies have entered into a PA. The PA stipulates inventory of cultural resources, monitoring of these resources for impacts from dam operations, and remedial actions to mitigate damage identified during monitoring.

On February 9, 1994, the PA became a legally binding document when it was signed by the Advisory Council on Historic Preservation. Other signatories include the Arizona SHPO; Reclamation's Upper Colorado Regional Director; the NPS's Western Region and Rocky Mountain Regional Directors; and the chairmen or governors of the Hopi Tribe, the Hualapai Tribe, the Navajo Nation, the Paiute Indian Tribe of Utah, the Kaibab Paiute Tribe, the San Juan Southern Paiute Tribe (representing the Shivwitz Band of Paiute Indians), and Zuni Pueblo. The Havasupai Tribe has been invited to participate in the PA process from the beginning, but to date has not signed the PA.

The PA lays out a plan for agency compliance with Section 106 of the NHPA through the development of monitoring and management protocols for cultural resources in the river corridor. Starting with the inventory and evaluation of those resources, it then directs Reclamation and the NPS to develop and implement a plan for monitoring and remedial actions (Monitoring and Remedial Action Plan (MRAP)), and, finally, directs Reclamation and the NPS to develop a plan (HPP) for long-term monitoring and management. The HPP builds on the previously developed documents by incorporating them and expanding their scope. The HPP incorporates the MRAP and therefore supersedes it and becomes the implementation plan for the PA.

Preparation of the HPP by Reclamation and the NPS, its subsequent review by the signatories of the PA, and its implementation satisfies the requirements outlined in the PA for management of cultural resources in the river corridor. The main points of the PA are elaborated in Chapter II and the PA is included as Appendix A.

CONTENTS OF THE HISTORIC PRESERVATION PLAN

The remainder of the HPP contains the following information:

Chapter II: addresses the legal authorities for protection and mitigation of cultural resources within the river corridor. It also describes the respective missions of Reclamation and the NPS as they pertain to cultural resources within the corridor. Tribal authorities for those tribes who manage lands within the river corridor or who have status as tribal historic preservation offices (Hualapai and Navajo) are detailed. Tribal mission statements for all tribes participating in the PA are included, along with reference to the status of tribal historic preservation offices as they relate to this program. A brief description of the Native American Graves Protection and Repatriation Act (NAGPRA) and the legal responsibilities of Reclamation and the NPS as they pertain to NAGPRA follows. Finally, the requirements of the PA are described.

Chapter III: summarizes the GCDEIS, the APE for cultural resources, and the AMP and its responsibilities. Standard operating procedures for Glen Canyon Dam are described in terms of daily and hourly operations and in terms of beach/habitat-building flows. Conditions outside standard operating procedures are discussed and the requirements for consultation prior to high- or low-flow events are outlined.

Chapter IV: describes the role of the Grand Canyon Monitoring and Research Center (GCMRC) in terms of its administrative responsibilities, how it will articulate with PA signatories, and how it will integrate with Reclamation and NPS Section 106 and 110 responsibilities. The GCMRC's other roles will also be briefly described. These include coordinating the needs of the Adaptive Management Work Group (AMWG) with the scientific community, providing technical peer review and National Research Council review, coordinating cultural resources research with other research projects, and representing tribal interests external to the PA.

Chapter V: outlines the long-term management goals of the GCMRC as they pertain to cultural resources and the PA.

Chapter VI: describes the history of cultural resource inventories in the river corridor and summarizes the history of human adaptation to and occupation of the river corridor. Classes of cultural resource properties within the river corridor are defined. Archeological site types identified along the corridor are discussed. TCPs, resources, and values are defined by each tribe, and specific tribal examples are provided. The adequacy of the present data base is evaluated, in terms of both archeological inventories and inventories of TCPs.

Chapter VII: discusses long-term research goals and domains. Theoretical and cultural themes include chronology; demography/cultural affiliation; socio-political and ideological issues; technology and industry; exchange, trade, and commerce; subsistence; transportation and communication; and government. Methodological and ethnographic/tribal research domains are also included. Data needs are outlined for each research domain.

Chapter VIII: incorporates and replaces the previous MRAP. It therefore describes the parameters of the ongoing monitoring and remedial action program within the river corridor. It also outlines monitoring evaluation and mapping tasks that need to be completed to provide baseline data for long-term monitoring, and includes a plan for notification of agencies and tribes in the event of archeological discoveries. It describes the parameters of tribal monitoring programs, and outlines the long-term standard operating procedures for monitoring and remedial action, tribal monitoring, and repeat mapping of threatened sites.

Chapter IX: describes long-term data management procedures for cultural resources data. It includes sections on data to be maintained by the NPS, data to be maintained by the tribes, and data to be maintained by the GCMRC. Specifically in relation to the GCMRC, it details classes of data to be managed, access to data, procedures for updating data, procedures for incorporating cultural resources data sets and cultural resources concerns into non-cultural research, and procedures for reporting cultural resources research. Procedures for reporting cultural resources research incorporate the Secretary of the Interior's Standards for Reporting, the schedules established by the PA and by this document for reports, and procedures for reviewing requests for cultural resources research and research reports by investigators outside the PA and other GCMRC programs.

Chapter X: covers public outreach and education programs, both as they pertain to the PA and as they will be conducted by the GCMRC outside the scope of the PA.

Chapter XI: describes the requirements for periodic review of the HPP, as specific in the PA. It also discusses review of the Cultural Resources Program by peers and the National Research Council.

A list of preparers and bibliography also are included as part of this document. Appendixes include the PA, Standard Report Format for Annual Reports, Standard Request for Tribal Proposals, Archeological Site Data for the HPP, Tribal Policies and Resolutions Regarding NAGPRA and the Treatment of Human Remains, and Archeological Site Monitoring Forms.

CHAPTER II

Authorities and Responsibilities

FEDERAL LEGAL AUTHORITIES

Over 100 pieces of legislation exist which define federal historic preservation law. The first of these, the Antiquities Act of 1906, authorized the President "to declare by public proclamation [as national monuments] historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest." Much like the National Park Service Organic Act of 1916, federal historic preservation law is based upon the concept of conserving cultural resources for the benefit of future generations. While too numerous to detail in this document, a brief summary of the laws most pertinent to this program are described below.

Antiquities Act of 1906 (P.L. 59-209, 34 Stat. 335) provided for protection of historic, prehistoric, and scientific features on federal lands, with penalties for unauthorized destruction or appropriation of antiquities. It authorized the President to proclaim national monuments and require permits for scientific investigation of antiquities on federal lands. This Act was the first federal law dealing with archeological resources.

Historic Sites Act of 1935 (P.L. 74-292, 49 Stat. 666) declared "a national policy to preserve for public use historic sites, buildings, and objects of national significance for the inspiration and benefit of the people of the United States." It authorized the creation of the Historic American Buildings Survey, the Historic American Engineering Record, and the National Landmark Survey. It authorized the NPS to ". . . restore, reconstruct, rehabilitate, preserve, and maintain historic or prehistoric sites, buildings, objects, and properties of national historical or archeological significance and . . . establish and maintain museums in connection therewith." This Act set the tone for federal policies related to historic and prehistoric site preservation.

Reservoir Salvage Act of 1960 and the Archeological and Historic Preservation Act of 1974, as amended (P.L. 86-532 and P.L. 93-291, 88 Stat. 174) provided for the preservation of significant scientific, prehistoric, historic, and archeological materials and data that might be lost or destroyed as a result of federally-sponsored dam construction or other federally-sponsored projects.

National Historic Preservation Act of 1966 (P.L. 89-665, 80 Stat. 915), as amended in 1992 (P.L. 102-575) declared a national policy of historic preservation, including encouragement of preservation on state and private levels. It authorized the Secretary of the Interior to expand and maintain the National Register of Historic Places (National Register). It established the Advisory Council on Historic Preservation and designated SHPOs. It required federal agencies to consider the effects of their undertakings on properties listed or eligible for listing on the National Register. By incorporating Executive Order 11593, it instructed all federal agencies to support the preservation of

cultural properties and directed them to identify and nominate to the National Register properties under their jurisdiction which may be eligible. The 1992 amendments redefined "federal undertaking" and emphasized the interests of American Indians, Native Hawaiians, and Native Alaskans. It also introduced the concept of TCPs as National Register eligible properties and included additional provisions for confidentiality of site locational information.

Grand Canyon Enlargement Act of 1975 (P.L. 93-620, 88 Stat 2089) provided for the adjustment of the boundaries of Grand Canyon National Park (GRCA) through the incorporation of Marble Canyon Monument, Grand Canyon National Monument, and other surrounding federal lands. The law also transferred 95,000 acres of federal land to the Havasupai Reservation and allowed for the traditional use of an additional 85,000 acres of GRCA land.

Archeological Resources Protection Act of 1979 (P.L. 96-95, 93 Stat. 712) defined archeological resources as any material remains of past human life or activities that are of archeological interest and are at least 100 years old, required federal permits for their excavation or removal from federal lands, and set severe criminal and civil penalties for unauthorized removal. It provides for confidentiality of site locational information and calls for federal agencies to develop plans for archeological surveys of public lands.

Legislation Pertaining to Native Americans

Numerous laws, treaties, and executive orders provide for the establishment of Indian reservations and legal protection for the rights of Native Americans to express, believe, and exercise traditional religious practices. Federal agencies are responsible for consulting with tribal governments and traditional religious leaders to determine appropriate actions necessary for protecting and preserving Native American religious cultural rights and practices. These laws include the following:

American Indian Religious Freedom Act of 1978 (P.L. 95-341, Stat. 469) declared "the policy of the United States to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians; including, but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites."

Native American Graves Protection and Repatriation Act (P.L. 101-601, 104 Stat. 3049) assigns ownership or control of Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony that are recovered from federal lands to lineal descendants or culturally affiliated Native American groups. On tribal lands, Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony that are recovered remain with that tribe. This Act provides the framework for repatriation of objects held within federal or federally-funded collections to the culturally affiliated Native American group.

Executive Order 13007 of 1996, Indian Sacred Sites, provides for the accommodation of access to and ceremonial use of Indian sacred sites on federal lands by Indian tribes. Agencies are ordered to avoid adversely affecting the physical integrity of such sacred sites.

Environmental and Other Legal Authorities

National Environmental Policy Act of 1969 (P.L. 91-190, 31 Stat. 852) declared a federal policy to "preserve important historic, cultural, and natural aspects of our national heritage" by requiring federal agencies to utilize a systematic, interdisciplinary approach to ensure the integration of natural and social sciences in planning and decision making which may have an impact on the human environment.

Grand Canyon Protection Act of 1992 (P.L. 102-575) addresses protection of natural, cultural, and recreational resources of GRCA and Glen Canyon National Recreation Area (GLCA); interim operating criteria for Glen Canyon Dam; long-term monitoring and research for resource protection; and replacement of power generation lost through adoption of long-term Glen Canyon Dam operating criteria, as well as other administrative provisions related to preserving the Grand Canyon.

FEDERAL AGENCY RESPONSIBILITIES

Bureau of Reclamation Mission

> *The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public* (Reclamation 1995).

Reclamation's Upper Colorado Regional Office was named lead agency for the completion of the GCDEIS because Glen Canyon Dam is within the boundaries of the Upper Colorado Region. Reclamation's mission within the Glen Canyon Dam program is to operate Glen Canyon Dam primarily for water storage and secondarily for power generation in such a way that downstream resources (including cultural resources) are protected, or adverse impacts to these resources are mitigated.

Reclamation's NHPA Section 106 responsibility is limited to impacts on cultural resources caused by dam operations. These impacts are discussed in Chapter I above and consist of erosion due to sediment loss created by the existence of the dam. The dam is not likely to be the cause of all erosion that occurs within the river corridor, and part of the purpose of ongoing geomorphological studies related to cultural resources is to understand more clearly which impacts are and are not related to dam operations. Yet the very existence of the dam and the associated sediment deficit in the system exacerbates the side channel erosion. Therefore, all erosion of cultural resources located on river-deposited terraces is in one way or another related to the presence of the dam.

Regarding cultural resources, Reclamation's responsibility to Native American tribes rests in Sections 101 and 106 of the NHPA (including TCPs as specified in the 1992 amendments), both of which call for Native American consultation on actions which will impact cultural resources in which Native

Americans have an interest. Reclamation's interpretation, as stated in the GCDEIS (Reclamation 1995:318-319), is that Reclamation has no Indian trust responsibility for areas within the river corridor because dam operations do not affect currently designated reservation lands.

National Park Service Mission

In 1916, Congress created the NPS in the Department of the Interior to

> *promote and regulate the use of the federal areas known as national parks, monuments, and reservations ... by such means and measures as conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations* (NPS Organic Act, 16 United States Code 1).

The Redwood Act Amendments of 1978 further specified the NPS management responsibilities by adding

> *the protection, management, and administration of these areas shall be conducted in light of the high public values and integrity of the national park system and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress* (16 United States Code 1a-1).

The specific resource protection mandate of the NPS, "to conserve resources unimpaired" recognizes that both tangible resources (i.e., wildlife, physical features, archeological sites) and intangible values (i.e., natural quiet, solitude, scenic vistas, Native American spiritual and religious values) may be impaired.

The NPS management policies state that "Over the years, legislative and administrative actions have been taken that have brought some measure of change to these components of our national parks. Such actions impact park resources, yet they are not necessarily deemed to have impaired resources for the enjoyment of future generations" (Chapter I:3). As a consequence, the changes that have occurred in the Colorado River system because of Glen Canyon Dam do not substantially change the NPS management responsibilities for the resources and values protected by the NPS units; the changes merely provide a modified set of resources to conserve and protect.

Management of cultural resources along the river corridor is principally the responsibility of the NPS and both GLCA and GRCA. The primary management objective for both NPS units related to this program is the *in situ* preservation of resources. Maintenance of the stability and integrity of all cultural resources within the river corridor is the principal objective of the NPS within the parameters of this program. Recognizing that *in situ* preservation will not always be possible, collection of

information regarding these significant properties is a secondary objective. Additionally, providing conditions which are favorable for maintaining the integrity of the physical and biological components of the system which have traditional cultural value is also an objective.

General management objectives for NPS cultural resource management can be found in both *NPS Management Policies* and *NPS-28: Cultural Resource Management Guidelines*, release 4, dated December 9, 1994.

TRIBAL LEGAL AUTHORITIES AND TRIBAL RESOLUTIONS

The Hualapai Tribe has authority as delegated by the Advisory Council on Historic Preservation through the 1992 NHPA amendments for assumption of Historic Preservation Officer responsibilities for projects that occur on their tribal lands. The Navajo Nation is expected to assume the same responsibilities in the near future. The following Hualapai and Navajo resolutions pertain to tribal management of cultural resources:

Navajo Nation Cultural Resources Protection Act (CMY-19 88).

Navajo Nation Policy to Protect Traditional Cultural Properties (ACMA-39-86).

Navajo Nation Policies and Procedures Concerning the Protection of Cemeteries, Gravesites, and Human Remains (AVMA-39-86).

The 1992 NHPA amendments allow for the assumption of Historic Preservation Officer responsibilities by those tribes who have entered into the appropriate agreements as identified in Section 101d(2). Assumption of tribal Historic Preservation Officer duties by any tribe involved in this program will not affect the PA, as the agreement was in place prior to any tribe's assumption of Historic Preservation Officer duties, and each tribal signatory entered into the agreement as a consulting party to the agreement. Additionally, tribal Historic Preservation Officer responsibilities are restricted to tribal lands.

Native American Graves Protection and Repatriation Act and Tribal Consultation

Within the river corridor, NAGPRA applies to the discovery of Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony. Human burials are not common, but they do occur in isolation as well as in association with archeological sites. The respectful and appropriate treatment of human remains and objects is extremely important to the tribes. Reclamation and the NPS will be diligent in making sure that the terms of NAGPRA are met.

NAGPRA requires notification of inadvertent discoveries within three working days of the written confirmation of notification of discovery to the federal agency. All efforts will be made to notify the culturally affiliated tribes and initiate consultation as soon as possible. Reburial in the same or a

nearby location is often the preferred disposition, but the affiliated tribes have the final say on the treatment of human remains and NAGPRA objects. NAGPRA specifies that tribes culturally affiliated with discovered human remains or NAGPRA objects be consulted regarding their disposition. Determinations of cultural affiliation will be made in consultation on the basis of culturally diagnostic materials and other lines of investigation as identified in NAGPRA.

Responsibility for NAGPRA consultation and American Indian Religious Freedom Act (AIRFA) compliance rests with Reclamation for the portions of the river corridor legally within Navajo Nation boundaries. Parallel to that procedure, responsibility for NAGPRA consultation and AIRFA compliance rests with Reclamation for the portions of the river corridor legally within the Hualapai Tribe reservation boundaries (see Department of the Interior Field Solicitor, 1995, for a discussion of boundaries). Otherwise, responsibilities for NAGPRA and AIRFA compliance are assumed by the NPS, with assistance from Reclamation, if human remains and other NAGPRA items are discovered within the river corridor. The NPS will enter into individual Memoranda of Understanding with each of the affected tribes for inadvertent discoveries within NPS managed lands.

Each tribe has its own traditions and religious concerns regarding the treatment of human remains and NAGPRA items. In reference to the treatment of human remains, these traditions and concerns have been summarized in the form of tribal policy. Tribal policies and resolutions on this topic are included for each tribe in Appendix E.

PROGRAMMATIC AGREEMENT ON CULTURAL RESOURCES

The PA is a legally binding document which took effect upon the signature of the Advisory Council on Historic Preservation on February 9, 1994. It is included with this document as Appendix A. It contains stipulations (requirements for action) that, upon their completion and implementation, will satisfy NHPA requirements. These stipulations, as well as the status of their completion, are summarized below:

Identification and Evaluation

A total of 326 properties identified by the NPS within the APE have been determined eligible for inclusion on the National Register based upon recommendations provided by Reclamation and concurred by the SHPO. Cultural resources in the remaining 37 miles of the APE from Separation Canyon to Lake Mead were identified and evaluated by the Hualapai Tribe, with assistance from the NPS. Recommendations for National Register eligibility will be forwarded by the Hualapai Tribe to Reclamation so that Reclamation can consult with the SHPO on their eligibility. TCPs have been identified and recommendations concerning their National Register eligibility will be provided by the respective tribes to Reclamation for evaluation and will be subsequently submitted to the SHPO for concurrence.

Monitoring and Remedial Action

A plan for monitoring the effects of Glen Canyon Dam operations on historic properties within the APE and for carrying out remedial actions to address the effects of negative impacts to historic properties was developed by Reclamation, the NPS, and PA signatories. The plan, which has been in effect since 1994, provided for the identification and evaluation of previously recorded and unrecorded properties, and specified a consultation process for both ongoing monitoring and proposed remedial actions. It has generated data regarding downstream effects, identified ongoing impacts to historic properties (including TCPs), and developed and implemented remedial actions for treating historic properties subject to damage. These data were considered in Reclamation's long-term operating and monitoring plans governing dam releases.

Management

Reclamation and the NPS have incorporated the results of the identification, evaluation, and monitoring and remedial action efforts into the HPP for the long-term management of cultural resources within the river corridor. The HPP establishes consultation and coordination procedures, long-term monitoring and mitigation strategies, management mechanisms, and goals for long-term management of historic properties within the APE.

For the first draft of the HPP, Reclamation and the NPS took into consideration all comments received during a 60-day review period. For the final document, consideration was given to all comments received for a 30-day review period. The HPP is consistent with the Record of Decision (ROD) for Glen Canyon Dam operations that was signed by the Secretary of the Interior on October 9, 1996.

Dispute Resolution

Mechanisms are included in the PA to resolve objections by any of the signatories to plans, specifications, or actions proposed pursuant to the PA.

Review of the Programmatic Agreement on Cultural Resources

The signatories may review activities carried out pursuant to the PA; the Advisory Council on Historic Preservation will review activities, if requested, or if they so choose. A yearly meeting will be held among the signatories to review the PA and the results of the monitoring and remedial actions. Stipulations 6, 7, and 8 of the PA discuss procedures for amendment, termination, and failure to carry out the terms of the PA.

CHAPTER III

Operations of Glen Canyon Dam

GLEN CANYON DAM ENVIRONMENTAL IMPACT STATEMENT

The ROD, signed on October 9, 1996, documents the selection of operating criteria for Glen Canyon Dam, as analyzed in the final GCDEIS, dated March 21, 1995. The EIS on the operation of Glen Canyon Dam was prepared with an unprecedented amount of scientific research, public involvement, and stakeholder cooperation. Alternatives considered in the GCDEIS included the No Action Alternative (historic operations) as well as eight operational alternatives that provided various degrees of protection for downstream resources and hydropower production.

The ROD implements the Modified Low Fluctuating Flow Alternative (the preferred alternative) as described in the EIS on the operation of Glen Canyon Dam with a minor change in the timing of beach/habitat-building flows. This alternative was selected because it will reduce daily flow fluctuations well below the no action levels (historic pattern of releases) and will provide high steady releases of short duration which will protect or enhance downstream resources while allowing limited flexibility for power operations.

The Modified Low Fluctuating Flow Alternative incorporates beach/habitat-building flows which are scheduled high releases of short duration designed to rebuild high elevation sandbars, deposit nutrients, restore backwater channels, and provide some of the dynamics of a natural river system. In the GCDEIS, it was assumed that these flows would occur in the spring, when the reservoir is low, at a frequency of one in five years. However, instead of conducting these flows in years in which Lake Powell storage is low on January 1, they will be accomplished by utilizing reservoir releases in excess of powerplant capacity required for dam safety purposes. Such releases are consistent with the 1956 Colorado River Storage Project Act, the 1968 Colorado River Basin Project Act, and the 1992 GCPA.

Nine alternative methods of operating Glen Canyon Dam (including the No Action Alternative) were presented in the GCDEIS. The eight action alternatives were designed to provide a reasonable range of alternatives with respect to operation of the dam. Seven elements are common to all of the alternatives. These common elements are: (1) adaptive management, (2) monitoring and protecting cultural resources, (3) flood frequency reduction measures, (4) beach/habitat-building flows, (5) new population of humpback chub, (6) further study of selective withdrawal, and (7) emergency exception criteria. A detailed description of the alternatives and common elements can be found in Chapter II of the GCDEIS.

The goal of selecting a preferred alternative was not to maximize benefits for the most resources, but rather to find an alternative plan of operation that would permit recovery and long-term sustainability of downstream resources while limiting hydropower capability and flexibility (only to the extent necessary to achieve recovery and long-term sustainability). The decision process for selecting the preferred alternative for the GCDEIS followed a repetitive sequence of comparisons of effects on downstream resources resulting from each alternative. Alternatives resulting in unacceptable adverse effects on resources (such as long-term loss of sandbars leading to the destruction of cultural resource sites and wildlife habitat) were eliminated from further comparisons. Comparisons continued until existing data were no longer available to support assumed benefits.

The Modified Low Fluctuating Flow Alternative was selected as the preferred alternative because it would provide the most benefits with respect to the original selection criteria. Nearly all downstream resources are dependent to some extent on the sediment resource. This alternative meets the critical requirements of the sediment resource by restoring some of the pre-dam variability through floods and provides a long-term balance between the supply of sand from Grand Canyon tributaries and the sand-transport capacity of the river, which in turn, benefits the maintenance of habitat. This alternative would create conditions that promote the protection and improvement of downstream resources while maintaining some flexibility in hydropower production. Although there would be a significant loss of hydropower benefits due to the selection of the preferred alternative (between $15.1 and $44.2 million annually) a recently completed non-use value study conducted through the GCES indicates that the American people are willing to pay much more than this loss to maintain a healthy ecosystem in the Grand Canyon. The results of this non-use value study are summarized in Attachment 3 of the ROD.

ADAPTIVE MANAGEMENT ORGANIZATION AND RESPONSIBILITIES

Many uncertainties exist regarding the downstream impacts of water releases from Glen Canyon Dam. With the completion of the GCDEIS and the signing of the ROD, a process of "adaptive management" will be implemented. "The concept of *adaptive management* is based on the recognized need for operational flexibility to respond to future monitoring and research findings and varying resource conditions" (Reclamation 1995:34, Lee 1993). This concept is a direct result of the GCDEIS and is clearly delineated in the GCPA which states that Glen Canyon Dam will be operated in such a manner as to protect, mitigate adverse impacts to, and improve the values for which the GRCA and GLCA were established. These values include, but are not limited to natural and cultural resources and visitor use (GCPA, Section 1802(a)).

The AMP, as detailed in the GCDEIS, "was developed and designed to provide an organization and process for cooperative integration of dam operations, resource protection and management, and monitoring and research information" (ibid). "The purpose of the AMP would be to develop modifications to Glen Canyon Dam operations and to exercise other authorities under existing laws as provided in the GCPA to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established" (ibid). Long-term monitoring, research, and adaptive management will be designed and implemented to provide an organization and process for cooperative and integrated protection and management of resources affected by the operation of Glen Canyon Dam.

In addition to the requirements placed upon Glen Canyon Dam operations by the GCPA, the PA on Glen Canyon Dam Operations was developed to satisfy federal compliance responsibilities with Section 106 of the NHPA and its implementing regulations found in 36 CFR 800.

Much overlap exists between the long-term monitoring and research program detailed in the GCDEIS and the PA. The AMP sets the framework for the AMWG and the GCMRC. Organizational principles and duties are detailed in the GCDEIS. "Long-term monitoring and research associated with cultural resources would be carried out in accordance with the approved PA. All provisions agreed upon by the consulting parties would be implemented through the MRAP and HPP. Activities outlined in these documents would be coordinated through the GCMRC to ensure integration with other facets of the long-term program" (ibid, pp. 37-38).

The AMP is detailed in the GCDEIS and is listed as the first environmental commitment in the ROD. The second commitment is for "Monitoring and Protection of Cultural Resources" (ROD, Section VI). Although preservation of cultural resources is also specified in the GCPA, implementation of the PA is dictated by federal agency responsibilities under the NHPA and represents federal historic preservation mandates. Federal agency responsibilities are clear and direct related to cultural resource preservation as detailed in the NHPA. Regardless of the schedule for implementation of the ROD, federal agency responsibilities related to NHPA compliance are specific.

STANDARD OPERATING PROCEDURES FOR GLEN CANYON DAM

With the signing of the ROD, standard operating procedures for Glen Canyon Dam are the modified low fluctuating flows as described in the GCDEIS. Those flows substantially reduce daily fluctuations from historic levels and include habitat maintenance flows as part of the alternative (ROD, 1996).

The flow regime specifies minimum releases of 8,000 cfs between 7 a.m. and 7 p.m. and 5,000 cfs at night; maximum releases of 25,000 cfs; daily fluctuations (cfs/24 hours) of 5,000, 6,000, or 8,000, depending on the monthly release volume; and ramp rates (cfs/hour) of 4,000 up and 1,500 down (Reclamation 1995:2). Rapid fluctuation of the river level is therefore not planned under normal operating procedures. Much of the HPP is based upon these parameters. The GCDEIS states the following:

> *The Modified Low Fluctuating Flow Alternative was developed to reduce daily flow fluctuations well below no action levels and to provide special high steady releases of short duration, with the goal of protecting or enhancing downstream resources while allowing limited flexibility for power operations. This alternative has the same annual and essentially the same monthly operating plan as described under the No Action Alternative but would restrict daily and hourly operations more than any of the previously described fluctuating flow alternatives* (Reclamation 1995:27-28).

The GCDEIS preferred alternative calls for periodic controlled high releases of two types under standard operating procedures. ***Habitat maintenance flows*** are intended to "reform backwaters and maintain sandbars, which are important for camping beaches and wildlife habitat" (Reclamation

1995:28). Habitat maintenance flows are "high, steady releases within powerplant capacity (33,200 cfs) for one to two weeks in March" (Reclamation 1995:29). Restrictions on habitat maintenance flows are described on page 29 of the GCDEIS.

Beach/habitat-building flows are "scheduled high releases of short duration designed to rebuild high elevation sandbars, deposit nutrients, restore backwater channels, and provide some of the dynamics of a natural system" (Reclamation 1995:40). These are high releases of short duration (several days), once every four to five years, depending on the availability of water stored in Lake Powell. These flows will be accomplished by utilizing reservoir releases in excess of powerplant capacity required for dam safety purposes. Magnitudes of such flows would be "at least 10,000 cfs greater than the allowable peak discharge in a minimum release year for a given alternative but not greater than 45,000 cfs." The reasons for this flow magnitude are discussed in the GCDEIS (Reclamation 1995:40). A test flow was completed in March–April 1996 to test the predictions made in the GCDEIS.

Both kinds of high flows are considered beneficial to cultural resources, since the intention of both is to build sediment that would otherwise be lost to the system, thus enhancing the preservation of cultural resources. Preliminary results of the 1996 test flow indicate that habitat building flows are beneficial to most cultural sites in the system.

CONDITIONS OUTSIDE STANDARD OPERATING PROCEDURES

Events and conditions which lie outside the range of standard operating procedures for Glen Canyon Dam may have an effect on cultural resources. When and if these conditions occur, Reclamation will initiate both National Environmental Policy Act and NHPA procedures as appropriate.

When conditions outside standard operating procedures covered by the GCDEIS and the PA could impact cultural resources, studies will be developed, in consultation with the signatories, in the same way that studies for high-flow events are developed.

CONSULTATION PRIOR TO HIGH- OR LOW-FLOW EVENTS

Any effects of the yearly habitat maintenance flows on cultural resources are considered in the annual monitoring and remedial action reports of both GRCA and GLCA. When a beach-habitat/building flow is scheduled as part of the Annual Operating Plan (developed in the summer for the following water year), the AMWG will ensure that the Cultural Resource Manager of the GCMRC is informed of the planned high-flow event. The AMWG is responsible for scheduling test flows to allow adequate time to plan and implement mitigation and monitoring. The GCMRC will coordinate the schedule for submitting proposals for research and monitoring associated with the event, and the schedule for planning the event. The GCMRC will ensure that PA signatories are notified of all event planning meetings in which they have a stake.

CHAPTER IV

Grand Canyon Monitoring and Research Center

ADMINISTRATIVE ROLES AND RESPONSIBILITIES

The GCMRC was established in November 1995 by the Assistant Secretary for Water and Science, Department of the Interior, in response to language in the GCPA of 1992. Section 1802 of the Act identifies that Glen Canyon Dam will be operated "in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources and visitor use." Section 1804 refers to annual operating plans for Glen Canyon Dam.

Section 1805 of the Act states that "The Secretary of the Interior shall establish and implement long-term monitoring programs and activities that will ensure that Glen Canyon Dam is operated in a manner consistent with that of Section 1802." Part (b) of that section states that "Long-term monitoring of Glen Canyon Dam shall include any necessary research and studies to determine the effect of the Secretary of the Interior's actions under Section 1804 on the natural, recreational, and cultural resources of Grand Canyon National Park and Glen Canyon National Recreation Area."

Adaptive Management Program

The GCDEIS and the ROD specified the development of an AMP. The purpose of the program, as described in the GCDEIS, is to "develop modifications to Glen Canyon Dam operations and to exercise other authorities, under existing laws, as provided in the GCPA to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established. These values include, but are not limited to natural and cultural resources and visitor use" (Reclamation 1995:34). "In carrying out the AMP, the Secretary of the Interior, or his designee, would develop, as appropriate, modifications to operating criteria or other management actions in consultation with all interested parties and an AMWG" (ibid, 35). This charge is accommodated through interactive programming with a broad-based group of stakeholders and scientists that constantly assess information needs and then implement monitoring and research activities to best respond to the information needs of stakeholders relative to "... the effect of the Secretary's actions," i.e., "dam operations" (GCPA, Section 1805(b)). The interactive process of testing and evaluating new criteria and the development of information for revised management actions constitutes the adaptive management process.

The AMP will function through the establishment of the AMWG. That group, formed as a federal advisory committee, will be comprised of representatives appointed by the Secretary of the Interior in accordance with the consultation provisions of the GCPA. Two other entities were identified in the GCDEIS as portions of the AMP to assist the AMWG. They are as follows:

Grand Canyon Monitoring and Research Center.—The GCMRC is responsible for developing the annual monitoring and research plan, managing all adaptive management research programs, and managing all data collected as part of those programs. All adaptive management research programs are coordinated through the GCMRC.

The GCMRC conducts short- and long-term ecosystem monitoring and research programs to study "dam operations" and other information needs as specified by the AMWG. The activities evaluate resource impacts and changes resulting from "dam operations" on physical, biological, and cultural resources in the river corridor, and inform the AMWG of resource protection, management, and use implications of alternative dam operating criteria.

Long-term monitoring and research associated with cultural resources identified as part of the Section 106 process will be carried out in accordance with the PA. All provisions, as agreed upon by the signatories to the agreement, will be implemented through the HPP. Activities outlined in the PA and HPP are coordinated through the GCMRC to ensure integration with other facets of the long-term monitoring and research program.

Technical Work Group.—The Technical Work Group will be comprised of technical representatives from the AMWG. The primary purpose of the group is to translate AMWG policy and goals into resource management objectives and establish criteria and standards for long-term monitoring and research in response to the GCPA.

Administrative Aspects of the Grand Canyon Monitoring and Research Center

The GCMRC was established as an independent entity under the Secretary of the Interior to gather information by conducting long-term monitoring and research activities. The purpose of the GCMRC's monitoring and research activities is to provide information to the AMWG. Data obtained through these efforts is transmitted to the AMWG to address their objectives and assist them in formulating recommendations to the Secretary of the Interior concerning current and future dam operations. As articulated in the GCDEIS, "the Grand Canyon Monitoring and Research Center's administrative responsibilities would include managing resource data, reporting monitoring and research results, administering contracts, and developing annual reports. The GCMRC would emphasize long-term monitoring and research design, integration, and program management" (ibid, 37).

Specific duties of the GCMRC, as outlined on page 37 of the GCDEIS, are given below:

- Develop research designs and proposals for implementing monitoring and research identified by the AMWG.

- Manage all monitoring and research on resources affected by dam operations.
- Manage and maintain the GCES information data base, monitoring and research programs, and other data sources as appropriate.
- Coordinate, prepare, and distribute technical reports and documentation for review and as final products.
- Coordinate review of the monitoring and research program with the independent review panel(s).
- Prepare and forward technical management recommendations and annual reports, as specified in Section 1804, to the AMWG.

Four program areas have been established within the GCMRC. These programs are biological, cultural, physical, and socio-economic. The results of activities in these program areas are provided to the AMWG to assist them in formulating their recommendations.

CULTURAL RESOURCES PROGRAM

The Cultural Resources Program of the GCMRC is charged with, among other duties, coordinating activities as agreed upon through the PA process and articulated in the HPP. External from the PA process, the GCMRC is charged with designing and implementing monitoring and research activities that assess cultural resource impacts related to Glen Canyon Dam operations as specified in the GCDEIS and ROD. Objectives and information needs for the Cultural Resources Program are developed in the AMWG and by the PA signatories. These objectives and needs are then formulated into monitoring and research activities for the GCMRC's long-term monitoring and research plan. As stated in the GCDEIS, the cultural resource activities of the GCMRC will be conducted in accordance with the PA stipulations, to ensure integration and compatibility between the PA program articulated in the HPP and the GCMRC's long-term monitoring and research program. Information collected through the ongoing monitoring programs is provided to the GCMRC for integration with other data related to resource impacts from dam operations. This information is forwarded to the AMWG to assist them in formulating their recommendations.

The GCMRC's Cultural Resources Program was developed specifically to coordinate, facilitate, and manage monitoring and research related to tribal needs external to the compliance program articulated in the PA. These activities form a part of the larger program that includes tribal participation in resource assessments and research, data management and information dissemination.

The GCMRC's Cultural Resources Program manager is the primary contact for interaction between the GCMRC and the PA signatories. All work related to the PA is coordinated through the program manager to ensure integration with other program elements.

The overall GCMRC Cultural Resources Program incorporates the interface with the PA and HPP along with the broader realm of cultural resources. While the PA addresses the legal compliance

responsibilities of Reclamation and the NPS through the NHPA, the GCMRC is responsible for integrating cultural resource concerns with the other resource programs to determine the overall health of the entire Grand Canyon riverine ecosystem as defined by the GCPA.

The definition of cultural resources must be viewed in a broad sense in the GCMRC program. The GCMRC mission is to develop and implement long-term monitoring and research programs to determine the effect of Glen Canyon Dam operations on physical, biological, cultural, socio-economic, and recreational resources. The Cultural Resources Program was identified to, among other tasks, specifically facilitate monitoring and research related to tribal needs. The program manager will ensure integration of tribal concerns with all other monitoring and research elements.

Cultural resource concerns external from NHPA compliance requirements are focussed on tribal concerns for resources. These concerns often center on natural resource concerns from both a physical and a theoretical perspective. While the Euro-American demarcation between cultural and natural resources is very clear, tribal views of this distinction are not. A federal land manager will typically view a spring as a natural resource, but a tribal land manager will often view the same resource as a cultural resource. This difference in world view is at the center of the overlap between natural and cultural resources that will be the core of the GCMRC's program.

Tribal research and monitoring related to flora, fauna, and sediment deposition are all "natural" resource studies of culturally significant resources which are outside the bounds of the PA and HPP. These studies form part of the larger world of cultural resources as defined in the GCDEIS and the GCPA.

In addition to the overlap between natural and cultural resources, tribal concerns external to those viewed narrowly as cultural or natural are a part of the GCMRC's program. Coordination of other tribal programs, such as fisheries, hydrology, sedimentology, endangered species, and vegetation, will be done through all GCMRC program managers.

Program Description

The GCMRC's Cultural Resources Program consists of three primary components that include a core program, a tribal projects element, and a cooperative programming aspect.

Core Program.—The core program consists of activities specified in the GCMRC's long-term and annual plans. These activities include monitoring and research activities that may utilize past archeological inventories as well as tribal monitoring programs. Data generated from these activities shall be incorporated into the GCMRC's long-term monitoring plans. In addition, tribal AMWG participants may design and implement complementary monitoring activities to evaluate their TCPs within the riverine corridor.

Individual Tribal Programs.—Opportunities exist for the tribes to enhance and enrich their monitoring and research programs through projects that focus on additional monitoring technologies, indirect impacts to resources, or alternative investigative paradigms. Projects that propose integrative and/or alternative investigative studies are encouraged by the GCMRC, including projects that

incorporate traditional methods with conventional scientific methods to formulate new investigative methods and insights that reflect Native American perspectives and complement a conventional scientific approach. Tribal proposals that extend outside the scope of the GCMRC's funding ability will receive assistance in securing funding from other sources for portions of the project that may not be directly funded by the GCMRC, but are related to its operations by linkages to resources being impacted. In this manner, the program manager will function in a coordinating role for total program integration through assistance in research planning and proposal preparation.

Cooperative Programming.—This component addresses areas where tribes may have common interests in both developing and participating in research planning and programming. Examples of common programming interests include the development of educational opportunities for Native American students, particularly the participating tribal groups. These opportunities may include the development of cooperative educational agreements among the GCMRC, universities and agencies, and the tribes to involve students in intern programs that are related to these resources, subject to monitoring and research activity in the canyon.

In addition, the GCMRC is concerned with the appropriate dissemination of monitoring and research information supported by public funding. The GCMRC will work with the Native American groups to develop appropriate mechanisms for the protection of sensitive information and public outreach such as publications in varying formats for information dissemination to tribal members, student outreach field trips and visits, and workshops developed by the GCMRC and Native American hosts to present differing perspectives on canyon resources and dam operations.

The Cultural Resources Program maintains an integrative and inclusive definition of cultural resources as defined by tribal participants in the AMP. Therefore, the Cultural Resources Program functions as an umbrella program across all tribal resource areas of interest or concern such as fisheries, hydrology, sedimentology, endangered species, and vegetation. The Cultural Resources Program manager is required to coordinate all resource programs of interest to Native American tribes with federal agencies, state agencies, etc.

In conclusion, the Cultural Resources Program consists of three major components: (1) monitoring and research activities to assess cultural resources as directed by the AMWG and specified in the GCMRC's long-term and annual plans, (2) individual tribal projects, and (3) general Native American issues such as educational opportunities and public outreach. Given the inclusive nature of tribal cultural resources, the Cultural Resources Program interfaces with other program projects to consider and address the concerns of tribal groups.

CHAPTER V

Long-Term Management Goals

MANAGEMENT TARGETS

In an effort to concentrate on goals agreed upon by those participating in the monitoring and research of resources in the river corridor, the GCMRC formulated management targets for each resource. Four management targets for cultural resources, plus one sediment management target that pertains to cultural resources, are described below.

Cultural Resources Management Targets

Target 1.—Preserve in situ all downstream cultural resources and take into account Native American cultural resource concerns in Glen and Grand Canyons.

Information Needs

- Develop data and monitoring systems to assess threshold levels for adverse impacts on cultural resources.
- Develop a predictive model of geomorphic processes related to archeological site erosion, including types of degradation; types of threats to resources; rates of degradation; definition of immediacy of threats to resources; protection methodologies; and protection, monitoring, and research costs.
- Develop data systems to assess variable risk of damage/loss of differing resources/sites from dam operating criteria.
- Evaluate flood terrace stability necessary to maintain cultural resources and terraces at pre-dam conditions.
- Develop tribal monitoring programs for the evaluation of impacts to cultural resources.
- Identify and evaluate tribal cultural resources.
- Provide management recommendations for tribal cultural resources.

Target 2.—If *in situ* preservation is not possible, design mitigative strategies that integrate the full consideration of the values of all concerned tribes with a scientific approach.

Information Needs

- Characterize through scientific study and data development all historical and current values of resources to tribal nations and the general public.
- Develop mitigation strategies related to documented site impacts and monitoring assessments.
- Develop mitigation costs.
- Evaluate the effectiveness of monitoring procedures.

Target 3.—For participating Native American tribes, protect and provide physical access to cultural resources and properties for religious purposes within the river corridor.

Information Needs

- Characterize historic and current religious associations of all sites within the river corridor.
- Develop tribal monitoring programs for evaluation of impacts to sacred sites.
- Assess potential effects from various flow regimes on access to these sites.

Target 4.—Develop appropriate research strategies which maximize data collection from mitigation and monitoring efforts.

Information Needs

- Characterize all cultural resource sites as to the specific associated management/research needs, i.e., preservation, stabilization, documentation, etc.
- Design and develop integrated relational data systems to support specific management and research program goals/designs. Implement and maintain systems.
- Develop technology/procedures for providing relevant/protected data to appropriate science groups/tribes.
- Ensure confidentiality of data regarding location and esoteric knowledge of cultural sites.

Sediment Management Target

Target 1.—Preserve terrace deposits at pre-dam levels.

Information Needs

- Develop data systems to assess variable risk of damage/loss of terrace sediment from dam operating criteria and from other sources.
- Geomorphology processes that promote erosion.
- Factors governing rates of erosion.
- Effects on terrace erosion of dam operations versus erosional processes not related to the operation of the dam.
- Understand long-term impacts of flows on streamside bank degradation (lateral bank retreat) and arroyo headwall damage, and model impacts to terraces as well as stabilization potentials.

GRAND CANYON MONITORING AND RESEARCH CENTER PROTOCOLS AND GUIDELINES

In the spring and summer of 1996, GCMRC staff worked with a subgroup of stakeholders to develop guidelines and protocols. Many of the PA participants were included in this group.

Protocols were developed around three general criteria. These criteria are (1) The GCMRC and the AMWG will have consistent and effective cooperative efforts in the areas of policy, administrative and science protocols, definition of research needs, and dissemination of research information and technology; (2) The GCMRC will plan, implement, and evaluate its research and monitoring programs from an ecosystem perspective; and (3) the AMWG will assist in providing definition of specific information and technology requirements associated with improved management, protection, and use of the resources in the Grand Canyon. In response to these criteria, the following general protocols for monitoring and research were developed for the GCMRC:

- The GCMRC will work cooperatively with the AMWG/Technical Work Group toward specification of short- and long-term monitoring and research needs for Grand Canyon, Marble Canyon, and Glen Canyon ecosystems.
- The development of short- and long-term monitoring and research programs, as well as criteria and standards, will utilize an interactive process of input and review by the AMWG.
- The GCMRC will utilize an ecosystem science paradigm to design and conduct monitoring and research programs, blending interactive attributes of physical, biotic, and human science issues.
- The information transfer programs developed cooperatively with the AMWG will be designed to enhance science and information transfer to agencies and stakeholders having critical need for knowledge of status of resources in the canyons. Areas of sensitive information (cultural resources and endangered species) will of necessity invoke protective constraints.

CHAPTER VI

Background and Description of Historic Properties

HISTORY OF CULTURAL INVENTORIES IN THE RIVER CORRIDOR

Given the cultural significance the Grand Canyon holds as a world heritage site and as one of the premier national parks in the national park system, there has been, until recently, very little archeological work accomplished there when compared to other areas of the southwest. Former GRCA anthropologist Robert Euler traces this problem to the federal bureaucracy stereotyping GRCA as a "natural science park as opposed to a historical one, an unfortunate bifurcation that may have set back archeological work there for almost a half a century" (Ahlstrom et al. 1993:66). Nevertheless, work has been carried out over the decades since Grand Canyon became a national park in 1919, and a considerable portion of the effort has taken place in the river corridor.

In the late 1800s, John Wesley Powell and Robert Brewster Stanton became the first Euro-Americans to observe and report on the remains of prehistoric cultures and the presence of extant ones in the river corridor. "Although the reports of Powell and other early adventurers helped focus public attention on the prehistoric remains of the Grand Canyon, they contributed little to our overall understanding of regional prehistory" (Fairley et al. 1994:4).

Walter Taylor conducted the first professional archeological project in the river corridor in June of 1953. This cursory look at sites was termed a reconnaissance of the Colorado River. The project, sponsored by the University of Arizona and the NPS, encompassed the river corridor from Lees Ferry to Pearce Ferry. In what must have been a race-like frenzy, the motor boat excursion covered the 280 river miles from start to finish in seven days. Averaging approximately 40 miles a day plus camping and decamping, the expedition members must have had little time for archeological work. Based upon the results of this survey, Taylor determined that the Grand Canyon's inner corridor was a zone of "limited occupation." Taylor's concept and carry-through of the plan was unusual for the times, and he deserves praise for his honest title, *Hail and Farewell and a Brief Survey Through the Grand Canyon of the Colorado River* (1958).

The hiatus of archeological work in the river corridor beginning after Taylor's whirlwind trip ended in 1960 when Douglas Schwartz conducted a survey of "agricultural" lands on Nankoweap Delta. This project was co-sponsored by the NPS and the University of Kentucky. Schwartz had done previous survey work in Cataract Canyon (Havasu Canyon) as well as Shinumo and White Creeks. He had also excavated four caves in the Redwall in an effort to retrieve split twig figurines (Schwartz 1954).

At Nankoweap, nearly 50 sites were recorded as agricultural. Schwartz framed dates for the occupation at A.D. 900 to 1200. His focus on agriculture was astute, and an area of study that has been neglected not only in the Grand Canyon, but on the Colorado Plateau in general.

The following year, Schwartz conducted another survey (June 1961) by rubber raft to investigate "likely areas of habitation" (Ahlstrom et al. 1993:151). The survey considered both banks of the Colorado River from Nankoweap Creek to Unkar Delta and an unspecified area of the Little Colorado River. Only 19 sites were discovered compared with the over 100 sites that have been recorded in the same stretch to date (Schwartz 1963, Fairley et al. 1994).

In 1965, Euler and Taylor revisited Nankoweap Delta. They re-recorded and added a few sites to Schwartz's inventory, condemned his ceramic analysis, expanded on the ceramic typology, and reframed the dates of occupation to include Basketmaker III and Pueblo IV times (Euler and Taylor 1966).

In addition to his work with Taylor, Euler had been working intermittently on surveying portions of the river corridor and side canyons in conjunction with the projected Marble Canyon Dam project between 1960 and 1966. Euler pioneered the innovative use of a helicopter in 1963. This technique had the positive effect of covering lots of ground quickly, but the convenience was often negated by the exclusion of smaller and more obscure non-structural sites that were overlooked, and hence omitted from the official record. Many of the field maps generated from this period are simple, with the notation "not to scale" or "did not land at site." Over 250 sites were documented during this project. Fifty of these properties had been previously recorded.

In the summers of 1967 and 1968, Schwartz returned to the canyon to undertake the monumental task of a major excavation on Unkar Delta. The sites, consisting of large villages and their associated agricultural features, had been initially recorded by Taylor in 1953 and again by Euler in 1960. Schwartz's important and comprehensive work at Unkar Delta was not only the first major excavation in the river corridor, but remains the largest and most extensive. Establishing a chronology and determining paleoenvironment were the focus of the project, which is described in great detail in *Archeology of the Grand Canyon: Unkar Delta* (Schwartz, Chapman, and Kepp 1980).

Schwartz was back in the canyon in 1969 to excavate Bright Angel Pueblo. This project revealed two distinct occupations and episodes of construction along with the identification of locally produced ceramics. Of particular importance at the Bright Angel site was identification of episodes of flooding in the lower most structure, a situation overlooked until GRCA archeologists began documentation related to Glen Canyon Dam operations. This simple notation by Schwartz, although only mentioned within the excavation description, indicated that prehistoric peoples did not necessarily build above the flood plain, a premise that had been espoused by many working in the area. This work is described in *Archeology of the Grand Canyon: The Bright Angel Site* (Schwartz, Marshall, and Kepp 1979).

In 1969, Euler organized an excavation project for Stanton's Cave, located in Marble Canyon. Over a period of five weeks in the summer of 1969 and the early fall of 1970, Euler and a crew from Prescott College documented the presence of Archaic hunting groups in the river corridor. These Archaic people are represented by a few simple tools and the beautiful split twig figurines they left

behind in the cave. Euler's work at Stanton's Cave is another crucial addition to understanding regional and local prehistory. Further information on this work can be found in *The Archeology, Geology, and Paleobiology of Stanton's Cave, Grand Canyon National Park, Arizona* (Euler 1984).

In 1984, Anne Trinkle Jones and a crew of NPS archeologists conducted minor excavations at four sites in the river corridor plus a single site located up a major side canyon. This work preceded the stabilization work that GRCA planned to do the following field season at these sites. Although the excavations were of a limited nature, the valuable contribution of digging stratified deposits from several locations along the river narrowed another gap in the record (Jones 1986).

From August 1990 through May 1991, NPS archeologists, in conjunction with Northern Arizona University and Reclamation, conducted an intensive archeological survey along the Colorado River corridor from the base of Glen Canyon Dam to Separation Canyon. This inventory was the first comprehensive ground survey completed within the river corridor. The purpose of the survey was to systematically identify cultural resources potentially affected by the operation of Glen Canyon Dam. Survey crews consisting of three to four members transected the rough terrain from river level up to the supposed pre-dam maximum flood height.

The project, under the direction of GRCA archeologist Janet Balsom and field director Helen Fairley, documented a total of 475 archeological sites over a 255-mile stretch of the river encompassing approximately 10,500 acres. The contribution of this project is fourfold: (1) it added a considerable new body of information to the existing record; (2) it tied together much of the sporadic work done previously; (3) it represented an example of the cooperative efforts among Reclamation, the NPS, Northern Arizona University, the various tribal governments, and the Arizona SHPO; and (4) the survey project generated the baseline data to allow the current monitoring project to effectively begin.

Since the completion of this large survey, a testing project to determine the National Register eligibility of nine sites in the river corridor has been completed, and three of the sites were determined eligible (Leap 1994). A cultural resources inventory of Hualapai lands encompassing the lower 37 miles of river corridor between Separation Canyon and Pearce Ferry has also been done (Hualapai Tribe's Cultural Resources Program, 1994). Nine archeological sites were recorded during this survey and these sites are in the process of eligibility determination by Reclamation and the SHPO.

As the PA stipulates, ethnographic research on TCPs has been supported by Reclamation and undertaken by the Hopi Tribe, Hualapai Tribe, Navajo Nation, Southern Paiute Consortium (which includes for the purposes of these studies the Kaibab Paiute, San Juan Southern Paiute, and Paiute Indian Tribe of Utah), and Zuni Pueblo. TCP reports have been submitted by the Hopi Tribe (Ferguson 1995), Hualapai Tribe (Jackson 1993, Phillips and Jackson 1996), Navajo Nation (Roberts et al. 1995), Southern Paiute Consortium (Stoffle et al. 1995a, 1995b), and Zuni Pueblo (Hart 1995, McKinley 1995a, 1995b). The only tribe with documented presence in the river corridor who has not undertaken ethnographic studies is the Havasupai.

These descriptions pertain only to work in the actual river corridor. A body of archeological work has been done on the rims and in other areas of GRCA and is available for study in various publications and at regional repositories. A good synopsis of this work can be found in *An Archeological Overview of Grand Canyon National Park* (Ahlstrom et al. 1993).

HUMAN ADAPTATION TO THE COLORADO RIVER CORRIDOR

Human occupation along the river corridor is influenced by numerous environmental factors. Euler and Susan Chandler (1978) suggested that critical factors for prehistoric occupation centered on the availability of water, access and egress routes, arable land, geologic and biologic resources, and shelter from the elements. In evaluating the occurrence of human occupation along the river corridor, we find that the controlling variables seem to relate most directly to geomorphic situations, primarily the availability of alluviated debris fans, terraces, and fault-controlled access and egress routes. Given the proximity to the river, it is not surprising that water is not a critical factor in settlement along the Colorado River.

Across the area of the river corridor, evidence of human occupation clusters around two specific locations centered in the Furnace Flats and Lava Falls areas. These two locations contain the highest site densities within the corridor, reflect relatively wide areas with significant alluvial terraces, and contain numerous access routes into the canyon. The sites, however, are distributed along the entire length of the river corridor as shown in Figure 6.1.

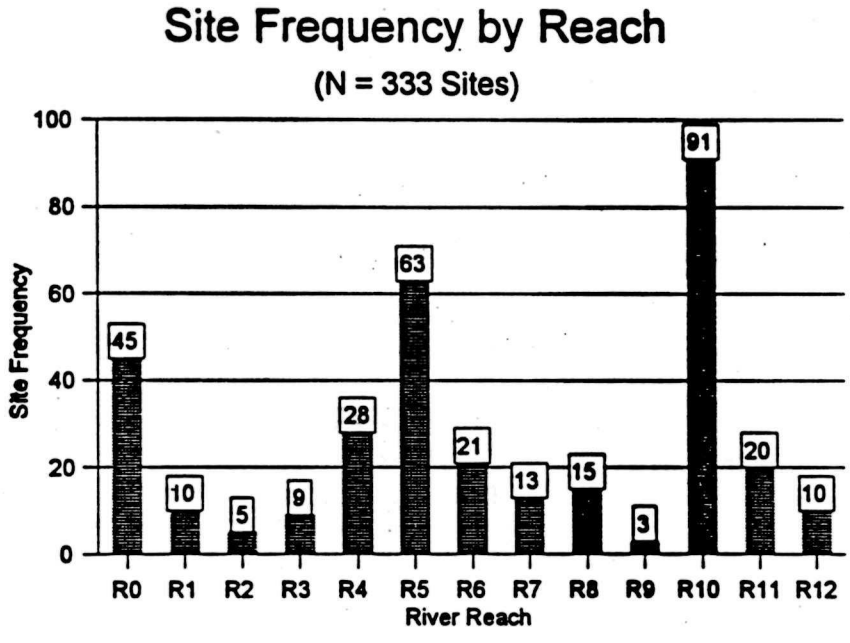


Figure 6.1.—Site Frequency by Reach

Spatial patterning occurs along the river corridor as well. Although many consider Phantom Ranch and Bright Angel Creek as dividing lines between upper and lower river stretches, Kanab Creek, located 140 miles downstream from Lees Ferry, is a more accurate mid-point. The eastern section, located above Kanab Creek, is characterized primarily by Puebloan occupations represented by architectural sites, storage sites, and farming communities. In contrast, the western section, below Kanab Creek, was home to Pai and Paiute peoples and is characterized primarily by roasting and food processing locations and seasonal occupation sites.

Temporal patterning is also evident, with the majority of sites dated pre-A.D. 1200 occurring in the eastern section, and those dated post-A.D. 1200 occurring primarily in the western section. While this general pattern seems apparent, the interpretation may be erroneously simple, reflecting site formation and preservation rather than cultural patterns. Similarly, the paucity of Paleoindian and Archaic materials may be a function of geomorphic and taphonomic processes, rather than human behavior. It is possible that early occupations are masked by river-deposited terraces, or no longer exist due to erosion of these same terraces. Cultural/temporal affiliation of sites, as recorded during the 1990-1991 inventory, is shown in Figure 6.2.

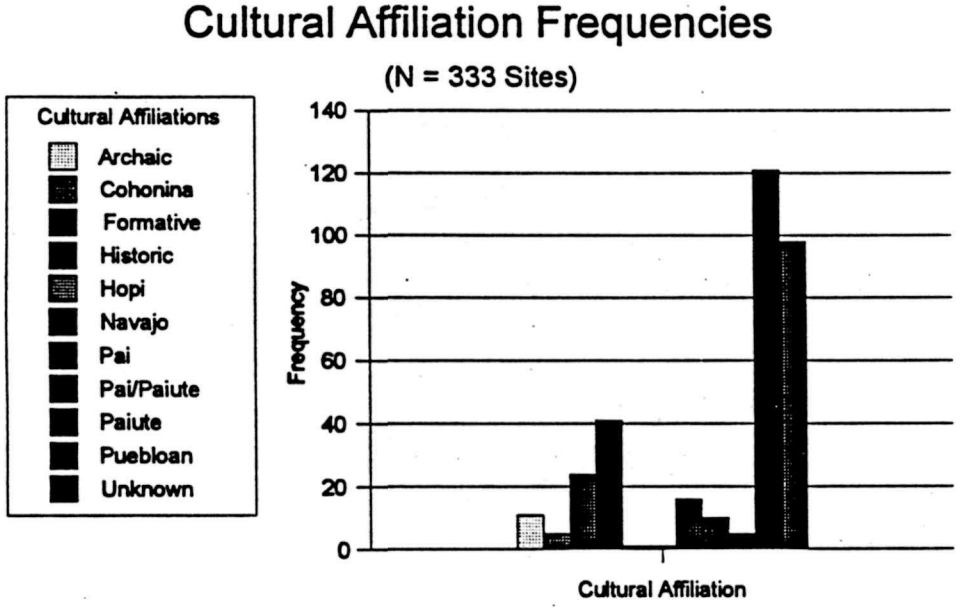


Figure 6.2.—Cultural Affiliation Frequencies

DEFINITION OF CLASSES OF CULTURAL RESOURCE PROPERTIES

Cultural resources within the river corridor can be thought of in two ways for the purposes of this document. The first reflects definitions of the professional archeological community and includes the archeological sites attributed to temporal periods recorded during archeological surveys of the river corridor. The second considers the definitions of those Native American groups that have ancestrally lived in or visited the Grand Canyon, and includes the TCPs recorded during ethnographic research.

Archeological Feature Types Within the River Corridor

The archeological feature types described below may occur by themselves in the river corridor or in association with other feature types. Figure 6.3 shows the frequency of feature types in the river corridor.

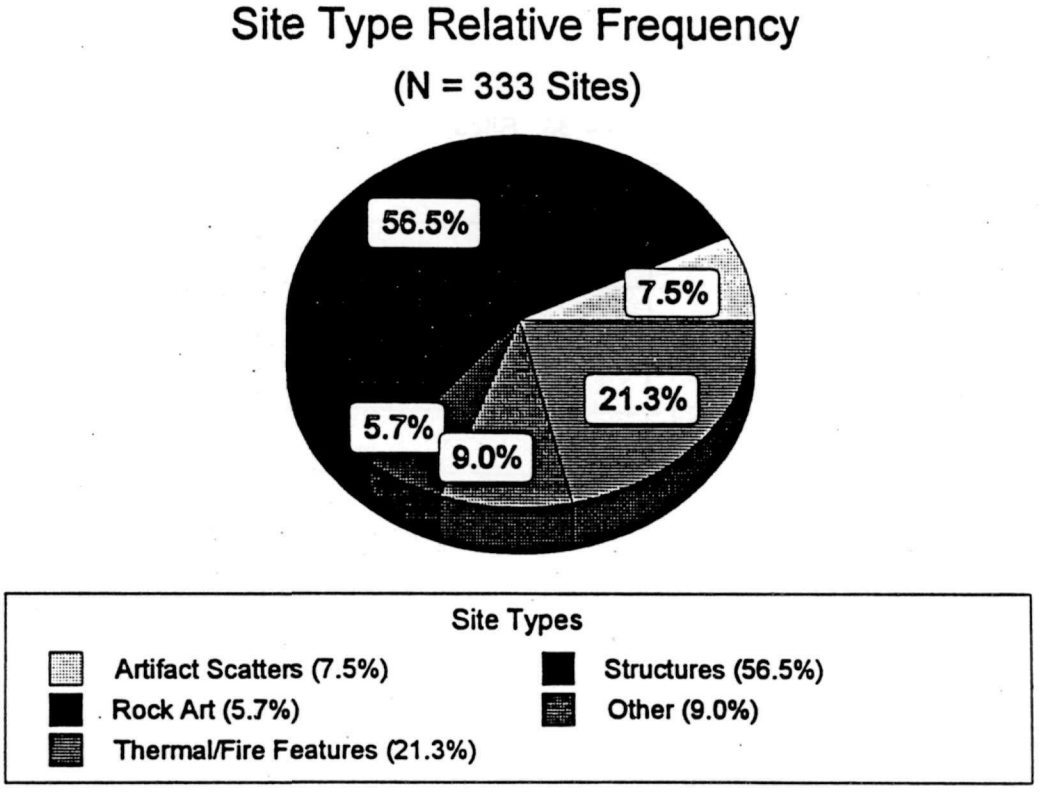


Figure 6.3.—Site Type Relative Frequency

Artifact Scatters.—This category is defined by the presence of ceramic sherds, flaked stone tools and debris, ground stone, or historic trash occurring on the surface. Other features and structures may or may not be associated with artifact scatters. This feature type is common and encompasses places which have only a few artifacts to those with several thousand items. Examples of sites in this category include "sparse lithic scatter with sherds present," "dense sherd concentration with fragmented ground stone," "projectile point with hand tools and flakes," and "purple glass fragments and hole-in-top cans."

Rock Art.—This category encompasses all pictographs, petroglyphs, and inscriptions including single isolated elements, small groups, large panels, subtle marks, remnant smudges, and historic inscriptions by miners, surveyors, and others. Although the term "rock art" is considered inappropriate by some Native American groups and usually refers only to the inscriptions of indigenous peoples, it is used here for lack of a better term.

Thermal/Fire Features.—This category is defined by the presence of features related to fire use including hearths, roasting pits, fire-altered rock discard piles, and concentrations of fire altered rock. Roasting features are commonly found singly and in groups ranging in size from 1 to 8 meters in diameter. They have variable profiles looking much like small volcanoes or scooped out circular pits. These features often have a rock discard or maintenance pile adjacent to the main feature, and may or may not have associated artifacts. This category is not meant to include burned structures, but would include burned cultural units found in cutbanks prior to testing.

Structures.—This category includes habitations that are constructed as well as rock shelters that show modification and/or evidence of occupation. Habitations include single course room outlines, roomblocks, partitioned or walled-in spaces utilizing boulders, outcrops and overhangs, wickiups and wickiup rings, and cabins. Structures also include cists and granaries. These features are found singly and in groups. Other kinds of structures that are more difficult to define and categorize include enigmatic and isolated alignments, stacked rock, erosion controls, water diversions, hunting blinds, brush and stone corrals, sweat lodges, bridges, and the built remains of operations such as mining, stock raising, railroad construction, scientific endeavors, and dam construction, along with other enigmatic structural remains.

Other.—Other features that occur in the river corridor are not easily categorized. These include bedrock mortars; bedrock grinding facets/slicks; trails; equipment, food, and tool caches (including isolated pots and pot caches); isolated individual artifacts of significant import; and any other enigmatic non-structural cultural manifestations that defy the broader categories.

TRADITIONAL CULTURAL PROPERTIES, RESOURCES, AND VALUES

Definition and Application

For most Native American groups, the common definition of TCPs used by governmental agencies and the historic preservation community is vastly inadequate for reflecting those portions of the traditional landscape that are of significance to indigenous people. The most commonly utilized

treatise discussing the concept of TCPs is the NPS Bulletin 38 (Parker and King 1992), a major step forward in the recognition that not all important historic resources are man-made and that Native American history is of importance to more than just Western-trained scientists. Bulletin 38 still falls short of its stated goals, however, primarily because its starting point is an ethnocentrically biased Western perspective on historical significance, and this perspective serves as a baseline to judge Native American history.

In Bulletin 38, TCPs are defined as properties associated "with cultural practices or beliefs of a living community that (a) are rooted in that community's history and (b) are important in maintaining the continuing cultural identity of the community." Additionally, in order to be eligible for the considerations afforded properties that are eligible to the National Register, the entity must ***be a property with defined boundaries***, it must ***retain integrity important to the community***, and it must meet at least one of the ***criteria of eligibility***. Taken in combination, these constraining requirements essentially limit TCPs to only those places that land managers think should be TCPs, not what Native Americans know as TCPs.

For Native American cultures, history is integrally tied to the present and is used to maintain and reaffirm all aspects of cultural identity, both spiritual and physical. As Native American history is inextricably tied to the natural landscape at all scales, it is culturally contradictory to segregate out certain aspects and arbitrarily define them as singularly important or significant; this is an imposed construct. It is within a specific context that any given feature, resource, or aspect of the landscape is imbued with cultural significance; and this context can vary both temporally and within a culture.

For example, the entire Grand Canyon is of traditional and historical significance to the tribes in the area, and hence is a TCP. Within it are archeological sites that are integrally a part of the culture of the ancestors of present-day Native Americans; these too are TCPs. On these sites, resources such as certain plants or animals may appear seasonally. These may also be considered separate TCPs dependant on cultural circumstances including the ceremonial cycle and ceremonial activities, as well as the specific cultural duties of the person witnessing these resources. The essence is that the TCP concept, as currently embraced, is a management construct that does not articulate well with the dynamic nature in which Native Americans view the landscape.

In order to better incorporate the broader concept of a TCP into the rigidly defined NHPA process, the concept of "historic property" in its fullest sense needs to be embraced. At issue is the apparent double standard employed when evaluating a non-Native American historic property versus a Native American historic property (a TCP). Take for instance a building typifying the construction and style at a certain period in time. In order for the building to qualify under the procedures in common usage for TCPs, it would have to be shown that the building is required for the continuation of the American culture and still fulfills the same integral function within the community that it originally did. Obviously, that is rarely the case. The importance of the building is in the much less tangible, though no less important recognition, that knowledge of the past is important to preserve. Recognition of Native American historical resources requires the same evaluative latitude by allowing those descendants whose legacy is the subject to decide what is historically significant.

As the TCP concept is currently interpreted by most federal and state cultural resource managers, it is essentially limited, with a few exceptions, to those aspects of traditional culture needed for ceremonial activities. This narrow focus, while supporting Native American religious freedom rights, a critical issue in its own right, does little for furthering Native American participation in the broader goals of cultural and historic preservation.

In recognizing the integral relationship between a tribe and what it considers to be TCPs, the HPP provides the opportunity for each tribe to define and evaluate its own TCPs. The unique culture, values, and history of each tribe have specifically shaped tribal views of the TCP concept and the identification of individual TCPs. Cited below are TCP statements reflecting each of the tribal perspectives:

Specific Tribal Examples

Havasupai.—The Havasupai Tribe has lived, worked, and participated in cultural activities in the Grand Canyon for centuries, a practice that continues to the present day. In all aspects of the cultural, spiritual, recreational, and traditional Havasupai (or Cohonino) life, the Havasupai Tribe considers everything in and around the Grand Canyon as sacred. In many ways, it is the entire environment (including the ecology, wildlife, geology, etc.) that is considered the TCP and is therefore sacred and to be protected and honored by all people. Our "Guardian of the Grand Canyon" Kachina still safeguards the interest of the tribe in any activity that goes on in the canyon.

Hopi.—For the Hopi Tribe, a TCP is any aspect of their cultural history that is of significance, as determined by the Hopi people and religious leaders, to the current culture by virtue of its role in the development and/or continuation of traditions that provide the historic foundation for the Hopi culture. TCPs can include, but are not limited to landscapes, natural features, springs, ancestral archeological sites and burials, shrines, resource collection areas, resources, and the knowledge that accompanies and defines the significance of these components of Hopi culture and history.

Hualapai.—The Hualapai people have geographic affiliation and territorial claim to the Grand Canyon and the Colorado River; these affiliations and claims originate in the Hualapai Creation Account recounted in Hualapai oral traditions. Fourteen Hualapai Bands comprise the Hualapai Tribe, each having a distinct dialect and territorial homeland in northwestern Arizona. Hualapai social identity correlates to several factors that include common language, kinship ties, social roles, past and present habitations, an intercanyon network of trails, social gatherings and ceremonial activities, utilization and distribution of natural resources (especially water, native plant products, wildlife, game, fish, and minerals), farming, technology, production of material goods, trade, and political and military alliances.

Hualapai TCPs include the territorial affiliation with the Grand Canyon and Colorado River system, Hualapai Indian Reservation, ethnobotany, wildlife, cultural geography, ethnic landscapes, archeology, ancestral cremations and burials, and mineral resources.

Cultural properties and places (past and present) do not necessarily consist of individual, discrete areas of concern for the Hualapai people, but in reality include the whole traditional landscape and cultural environment. Cultural properties are not limited to the material resources, but extend beyond the realm of Western beliefs into the world of spirituality and spiritual beings. Archeological sites and "sacred sites" have continuing timeless (eternal) significance to the lifeways, beliefs, and values of the Hualapai people who hold, cherish, and continue to practice traditional Hualapai lifeways.

The Hualapai Tribe has continually maintained its traditional territorial, historical, and cultural affiliation with the land, water, riparian, and riverine resources of the Colorado River system (inclusive of those within the Grand Canyon) by occupancy and use. The Hualapai Tribe has made continual use of the waters of the Colorado River system throughout Hualapai ancestral homelands, from the juncture of the Colorado and Little Colorado Rivers (river mile 61.5) downriver to the confluence of the Colorado River with the Bill Williams and Santa Maria Rivers, the western and southwestern limits of the traditional Hualapai territory.

Navajo Nation.—No TCP definition was provided by the Navajo Nation.

San Juan Southern Paiute Tribe.—No TCP definition was provided by the San Juan Southern Paiute Tribe.

Southern Paiute Consortium.—To the Southern Paiute Consortium, a TCP can take on many forms and can be physical, metaphysical, or a combination of these. A TCP is a place of high cultural significance that is pivotal to the physical and spiritual well-being of the people. It plays a pivotal role in traditional practices and beliefs. The property need not necessarily be site or place specific, but rather is usually inclusive of many resources and may encompass only a 12-inch area or may extend for several hundred miles.

Zuni.—A TCP is any place, object, material, or lifeform that has importance in Zuni traditions and culture, as determined significant by Zuni religious leaders. TCPs can be at any scale, can be nested within each other, and can overlap. Thus, for example, at one scale the Grand Canyon in its entirety can be considered a TCP, as can the whole river system including the Colorado River up the Little Colorado River, continuing up the Zuni River to Zuni Pueblo itself, and then on to the springs that feed this waterway. Within the Grand Canyon, an archeological site may be a TCP, as would be a shrine within the site, and the deer that wander on and off the site, throughout the canyon, and beyond.

The Zuni Tribe claims cultural affiliation with all so called Paleoindian, Archaic, Basketmaker, prehistoric Puebloan, Fremont, Anasazi, Mogollon, Hohokam, Sinagua, Western Pueblo, Puebloan, and historic Zuni archeological sites, features, and objects within the area of consideration for the PA under which the HPP is prepared. Archeological sites, features, and objects that may not be attributable to a specific prehistoric culture by archeologists, because of lack of culturally diagnostic artifacts, may also be culturally affiliated with Zuni. Any archeological and human remains that are culturally affiliated with Zuni, as identified by either archeologists or Zuni religious leaders, are considered TCPs.

EVALUATION OF THE PRESENT DATA BASE

Archeological Surveys

Methodology.—For this discussion, the present data base includes site survey records and monitoring data from GRCA and GLCA files related to sites located along the Colorado River. Much of this information was generated from the Grand Canyon River Corridor Survey Project (Fairley et al. 1994), although earlier information was incorporated from the existing files. These data cover a particular geographic area with the recent information focused primarily on erosional impacts to archeological sites in a dam-controlled rivering environment. Although the information was derived primarily from limited (surface) field observation, the systematic coverage and computerization of site and monitoring data make this data base one of the most consistent and well-documented archeological projects in the Grand Canyon.

Strengths and Gaps in the Present Data Base.—Strengths in the data base include a large geographic area of coverage (i.e., the river corridor), consistency in data recording, and the computerization of site and monitoring records. The gaps in the data base are related mainly to the nature of the survey and monitoring effort. Geographic coverage is exclusively related to the river corridor up to the supposed pre-dam high water mark. The cultural affiliation(s) and occupational dates of some sites are still unknown. Many sites, in particular earlier occupations such as Archaic and Basketmaker, may be buried and are therefore a presently (limited) unrecorded portion of the archeological record.

Data collected during the survey and subsequent monitoring sessions were derived from surface inspection of sites typical of site survey and repeat visits of selected sites for monitoring purposes. The monitoring population is of sufficient size to obtain valid erosion/impact data and is representative of the range of river corridor archeological sites. The location of sites is well documented. Less well known is what these sites represent and how they are affected by erosional processes. Questions of cultural affiliation, site function, population mobility, seasonality of use, and occupation still remain unanswered for some sites.

Efforts Needed to Close Data Base Gaps.—Any remedial action proposed as part of this program needs to be based upon a sound understanding of erosional processes, strict geographic control, and a strong linkage with the long-term research goals outlined in Chapter VII of this document. Data recovery associated with remedial actions will help close data base gaps. Several years of monitoring work have shown what physical and visitor-related impacts are occurring in the canyon environment. Integration of this information with the geomorphic model provides the foundation for determining the degree of impact and an approach to preservation. For erosional impacts, this may involve additional geographically controlled geomorphic studies at particular sites such as mapping arroyo cross-sections. For visitor-related impacts, education and increased interpretation of the fragility of the remains may help foster a conservation ethic.

Determinations of Eligibility and Significance.—Determinations of eligibility and significance for the sites located within the project area were made based upon an evaluation of all site information. Of the 475 sites recorded as part of the river corridor survey, 336 sites were considered to have direct, indirect, or potential impacts from river flows. The federal agencies and the Arizona SHPO concurred that 326 of the sites were eligible for inclusion on the National Register. National Register criteria were applied to each site within the river corridor. Sites were determined eligible on the basis of a single criterion or a variety of combinations of criteria; some sites are eligible on the basis of all four criteria.

According to the consultation letter submitted to the Arizona SHPO on October 23, 1991, by GLCA, Lees Ferry Fort, Lonely Dell Ranch, and the Spencer Steamboat were already listed on the National Register at the time of the 1990-1991 inventory. National Register eligibility for the sites recorded on the 1990-1991 inventory was applied as follows:

Criterion A.—Sites related to the construction of Glen Canyon Dam, its administration, mining operations, canyon exploration, early economic exploitation, transportation, tourism, recreation, and the Hopi Salt Mines [sic] were considered eligible under this criterion.

Criterion B.—Sites related to individual river runners, miners, explorers, colonists, and entrepreneurs were considered eligible under this criterion.

Criterion C.—Structures and features in the Lees Ferry National Register District, as well as sections of constructed dugways, were considered eligible under this criterion.

Criterion D.—Any site containing, or having a potential to contain, datable materials, including buried materials, was considered eligible under this criterion. Also included here were sites with historic or protohistoric Native American values (except well-known traditional cultural properties such as the Hopi Salt Mines [sic]), as well as sites where testing was recommended prior to full evaluation (October 23, 1991, letter:3).

Traditional Cultural Properties Surveys

Havasupai.—No TCP surveys have been conducted by the Havasupai to date.

Hopi.—

Methodology.—The Hopi Tribe has followed a two-pronged approach to identify TCPs in the project area. At Hopi, interview work has been conducted with clan and religious society representatives from each of the Hopi villages to elicit cultural information. In addition, infield examination of the project area has been made by representatives of the Hopi Tribe to evaluate and identify important resources.

The interview work at Hopi has been primarily oriented to gather information necessary for the Hopi ethnohistoric and ethnographic research that supported the completion of the final GCDEIS. Information gathered included general feelings about the Grand Canyon and its relationship to Hopi

culture and its development, opinions about how Glen Canyon Dam is and should be operated, and specific places and resources of traditional cultural value. Seventy interviews were conducted, some in English and others in Hopi, and all have been transcribed into written format. These interviews include representatives from all of the Hopi villages and from 25 different clans. Eight Hopi women were among the people interviewed.

The infield portion of the project consisted of the participation of Hopi Clan and religious societal representatives on four river trips. During these trips, information was collected concerning interpretation and management approaches for the cultural resources in the canyon, and more generally, culturally appropriate approaches to operation and management of Glen Canyon Dam and the Grand Canyon. In total, 19 Hopi individuals participated in these research trips representing 13 clans from eight of the 12 villages.

Strengths and Gaps in the Present Data Base.—There are two areas that have the potential to yield additional information concerning resources of traditional cultural importance to the Hopi people. First is additional interview work at Hopi. In Hopi society, traditional knowledge is held in a non-uniform manner. Specific society/clan members are solely responsible as the caretakers for various types of esoteric knowledge. Therefore, unless these people are part of the sample, information may not be obtained. This information should not be considered as "missing" data however. It exists and is known by the people who are entrusted to retain it; it is only "missing" in the sense that it has not been recorded by the previous research effort of the Hopi Tribe. Whether these data are relevant to the current project or are appropriate for documentation can only be decided by those who hold the information and their subsequent decision to participate in this process by providing the relevant information to the Cultural Preservation Office.

The second area in which there can be considered a gap in the Hopi data is for resources that are of traditional cultural importance, but for which there is no traditional mechanism for archiving classes of specific information. Resource classes such as ancestral archeological sites and plant, animal, and mineral resources are commonly identified to be of traditional cultural importance, but information concerning locational specifics is often not retained within the traditional knowledge system once the area in which they are located is no longer occupied. Relocation of these areas and resources requires direct interaction with the areas by those who value the resources.

Efforts Needed to Close Data Base Gaps.—Future efforts that need to be employed to close relevant gaps in the current Hopi data set would focus on interviewing and providing field visits to under- or non-represented clan and society members. In this way, it could be determined if the data being obtained were new or redundant. The most efficient approach, however, is to orient research into topic-specific questions so that a more focused selection process for Hopi consultants may be followed.

Determinations of Eligibility and Significance.—Evaluation of the significance of a TCP must be made within the context of the culture to which the resource is integrated. For the Hopis then, the only appropriate experts on what are significant resources and sites in Hopi history and culture are the Hopis themselves; they are uniquely qualified to evaluate Hopi history. What follows is a general examination of some classes of resources important in Hopi culture and history, within the framework established by the federal legislation (NHPA). It must be stressed, however, that for any given

resource, only a Hopi can adequately determine its significance and that aspects of its significance may be esoteric or privileged in nature, and revealing this information may reduce or have an adverse impact upon its cultural significance.

Criterion A.—This can be applied to properties that are associated "with events that have made a significant contribution to the broad patterns of [Hopi] history."

Most aspects of Hopi culture are the result of the migration period of the clans undertaken as partial fulfillment of the Hopis' covenant with *Ma'saw*. Ceremonies and clan histories that are at the center of, and integral to Hopi culture, were obtained during these migrations. Therefore, resources, both natural and human-produced, that relate to these migrations are potentially eligible. Such things as ancestral archeological sites, as a tangible record of these migrations, are identified as TCPs by the Hopi Tribe. Likewise, natural features and places where events occurred that are recounted in clan histories and other folk stories are felt to be TCPs. It should be noted that the nature of oral history (and history in general) necessarily focuses on those portions of history and culture that are of significance; if it were not of great significance, it would not have been recounted through multiple generations.

Criterion B.—This can be applied to properties that are associated "with the lives of persons significant in [Hopi] past."

All ancestral archeological sites are associated directly with *Ma'saw* and the Hopis' covenant to leave their footprints across the land. Additionally, many locations are associated with various actions of such figures as the War Twins, Salt Woman, and Kachinas. All these types of areas are considered to be TCPs by the Hopi.

Criterion C.—For the Hopis, the portion of this criteria that most directly applies identifies resources that are "representative of a significant and distinguishable entity whose components may lack individual distinction."

Here again, ancestral archeological sites that may be individually anonymous are identified as part of the greater clan migrations that are central to all that is Hopi. This category can also apply to many natural resources that figure prominently, or even vitally, into the Hopi culture. The Hopi Tribe identifies such things as certain types of plants, animals, minerals, springs, and other resources to be TCPs, as they figure integrally into Hopi culture and history.

Criterion D.—"Potential to yield information important in prehistory or history" of the Hopi people.

Many classes of natural resources, including archeological sites and natural features, have the potential to maintain traditional information and inform the Hopi people about their history through both Western scientific methods (i.e., archeological, ethnohistorical, and ethnobotanical research) and their involvement in the traditional learning methods employed within the Hopi culture (i.e., storytelling, ceremonial teaching, and apprenticeships).

Hualapai.—

Methodology.—The Hualapai Tribe's Office of Cultural Resources is committed to the strengthened development of the Hualapai Tribe's cultural and historic data base. The research design for the Hualapai Tribe is inductive, conducted in general agreement with concepts and methods established in grounded theory social research. The research design was developed from theoretical premises that ethnographic authority (Clifford 1988), and the validity of indigenous cultural knowledge (and the system of knowledge), are intrinsic within the context of the Hualapai cultural community. Therefore, data collection is designed so as to learn information from perspectives within the contexts of Hualapai culture.

Principles of contextualist interpretation guide the research, communicative interactions, and the uses of references and meanings as understood within contexts of Hualapai society and culture. By applying principles of social-historical contextual interpretation to the cultural and historical data, the research design requires the Hualapai Tribe's researchers and technicians to encounter and evaluate datum valid within the traditional and historic Hualapai cultural context, according to traditional principles within the Hualapai cultural system of knowledge. This approach to data conforms to Hualapai traditional social and political customs, particularly regarding the scholarly expertise of Hualapai traditional cultural practitioners.

An additional benefit of this approach to the data is that the integrity and validity of research encounters (i.e., interviews, site visits) are strengthened by the neutrality of the ethnographic methods. Neutral research methods are used, as they are readily usable by different groups in efforts to promote understanding.

Hualapai cultural scholars are "keepers" of the Hualapai Tribe's cultural and historic knowledge; with their expertise and proficiency in Hualapai language, historical experience, and worldview perspectives, they participate in the research as primary ethnographic sources. Inquiry is thus made regarding Hualapai culture and history, and about topics relevant to specific research objectives, as established by the Hualapai Tribe through the tribal government, the Hualapai Tribe's Office of Cultural Resources, and other cooperating agencies. To increase the ethnographic authority sought in the research, it was required that sanction for the research be maintained within the Hualapai Tribe.

To develop the probability that knowledgeable Hualapai cultural scholars and traditional practitioners would effectively participate in the research process, specific cultural, interpersonal, and transcultural procedures are followed. The Hualapai Tribe's Office of Cultural Resources initially learned that failure to engage these protocols would frustrate and undermine the research project. It became necessary for the Office of Cultural Resources and cooperating agencies to guarantee to the tribal government and the research participants that the research will not be used in ways harmful to Hualapai cultural continuity; the research and its results are to be used by the Hualapai Tribe for cultural resources protection. To ensure this, the release of data, information, and reports would be supervised and controlled by the Hualapai Tribal Council and Administration through its authorizations (and/or constraints) regarding research activities and findings.

In light of the epistemological principles guiding the research design, it is also required that the Hualapai Tribe retain its collective copyright and intellectual property rights over the data base and the content in associated reports. All information gathered during the research projects is the intellectual cultural domain and thus intellectual property of the Hualapai Tribe, and is not available for public review without the specific approval of the Hualapai Tribe as sanctioned by the Hualapai Tribal Council and Administration.

The researchers and technicians of the Hualapai Tribe's Office of Cultural Resources are members of the Hualapai Tribe. Interviews are conducted in Hualapai language and in English. Communications, rapport, and accountability within the context of the Hualapai community and culture are dramatically enhanced by the practice of the tribe conducting its own research and producing its own cultural-historic data base and cultural text.

Training sessions are conducted for Hualapai tribal members employed as researchers and technicians. Topics include field research techniques, oral history interviews, recording technology and procedures, writing, reporting, and archival standards. Workshop topics also include selection of research populations, research ethics, customs and protocols affecting inquiry, data collection methods, reliability and accuracy, emergence and analysis of comparative cultural and historical categories of information, comparison of research findings to scholarly literature, and methods of writing and documentation (styles, formats, editing procedures, and text production).

For each research project an interview guide is developed for standardized use in field interviews. Interview questions are revised and refined in the early phases of data collection. The survey instruments are not subjected to statistical testing; they are, however, subjected to extensive qualitative review and informal content analysis by Hualapai cultural resources technicians, the Hualapai Cultural Resources Advisory Committee, and the Hualapai Tribal Council. Operationally, this form of peer review within the community of indigenous cultural scholars serves to more than sufficiently test and reinforce the logic and validity of the survey instrument. Lack of pre-interview statistical analysis of the survey instrument does not diminish its instrumental validity (Bernard 1988, Denzin 1989).

The objectives of the research are to acquire and record distinctively Hualapai knowledge about Hualapai existence in and near the Grand Canyon and Colorado River. With this in mind, sample populations of Hualapai persons are sought for participation in the ethnographic-oral historical surveys. The selection of participants begins with purposive sampling (Bernard 1988). The data base is drawn from ethnographic and oral historical interviews conducted with Hualapai cultural scholars. Many of the cultural scholars who participate in the survey research are well regarded in Hualapai society with reference to their knowledge of the traditions of the Hualapai Nation and Bands or Clans. Particular efforts are made to enlist participation of consultants who are members of the Hualapai Bands that traditionally and historically resided in and continue to make use of the Grand Canyon of the Colorado's riverine environs. The cultural scholars' fluency in Hualapai language brings an added dimension of depth and a significant measure of validity to the project's efforts and results.

Additional "snowball" sampling reinforces the initial core of Hualapai cultural scholars and traditional practitioners collaborating in the Hualapai research projects. The sample population indicates a diversity within the Hualapai citizenry by age, sex, life experience, residence locations, occupation,

and education. This multi-perspectival set of accounts correlates to a high degree of accuracy in the presentation of complex, intersubjective data (Clifford 1988). A strong, diverse Hualapai cultural community is therefore actively engaged in the development of a data base comprised of substantial cultural and historic research findings.

Each participating Hualapai cultural scholar is regarded as a consultant and co-author. Each consultant signs a consent form stipulating that the Hualapai Tribe has exclusive archival authority. Field notes and interview transcriptions are in manuscript and are stored on computer diskettes, and are archived by the Hualapai Tribe's Office of Cultural Resources. Published historical, archival, anthropological, and other scientific literature, and additional unpublished documents about the Hualapai Tribe are also useful in the research and writing processes.

Strengths and Gaps in the Present Data Base.—Following are strengths in the present data base of Hualapai Tribe ethnographic information:

1. Ascertainment of Hualapai territorial affinity. As ancestral and historic homelands, and regarding cultural and natural resource uses and management, Hualapai origins, ancestral and contemporary homelands, and territorial claims associated with the Grand Canyon.

2. Identification, definitions, and descriptions of Hualapai cultural geography and ethnographic landscapes:

- Hualapai lands, waters, and natural resource uses.
- Hualapai habitations and other locations of cultural/historical significance.
- Culturally significant waters, minerals, and geomorphology.
- Locations of ceremonial and/or religious activities and rock writing.
- Assessment of the need for preservation of culturally significant locations.

3. Extensive, in-depth surveys of Hualapai ethnobotany:

- Culturally significant plants (native and culturally introduced plant species, horticulture and harvesting, and Hualapai farming techniques), plant uses, and products.
- Obligate plant habitats.

4. A preliminary survey of Hualapai wildlife and their cultural significance (mammals, birds, reptiles, and amphibians, and their cultural significance and taxonomies).

5. A series of investigations of Hualapai archeological sites:

- Evidence of Hualapai cultural materials, human habitation, technology, production, and trade.

- Concerns regarding sites of cremations, cairns, and burials; Hualapai ancestral human remains; and associated funerary items/memorial offerings.

6. Discussions of preservation and development:

   - Identification of the need to protect culturally significant locations/areas.

   - Consideration, deliberations, and recommendations regarding recreation, tourism, and economic development; and uses of Hualapai lands, waters, and resources.

7. Discussions of natural and cultural resource management at the tribal, federal, and state levels:

   - Hualapai multiple uses and long-term sustained yields.

   - Commitment to long-term follow-up, monitoring, and review.

8. Confirmation of the Hualapai Tribe's commitment to exercise sovereignty and self-determination in collaborative programs and agreements with agencies of federal trust responsibility (i.e., NPS).

Efforts Needed to Close Data Base Gaps.—Regarding geographical and archeological locations of cultural significance, references to cultural resources designated as ruins and sacred sites are recurrently problematic; usages of these terms require constant clarification.

"Sites" as a designation for features of geography and products of human culture are not limited in their significance to an exclusively past historical nature, nor to extremely limited physical proximities. Some boundaries are perceived as arbitrary and are restrictive of Hualapai access to TCPs and exercises of religious freedom. At times, inappropriate and opinionated determinations by non-Hualapai researchers or federal administrators and staff regarding their presumptions of research authority, interpretation of findings, and determinations precludes adequate consideration of research and findings developed by Hualapai cultural scholars and the Hualapai Tribe's Office of Cultural Resources.

The term "rock art" is not off-handedly rejected by Hualapai cultural scholars simply because it is thought to be an inappropriate term; as a conceptual or representative category it is inadequate and too easily misunderstood. The Hualapai Tribe prefers to accurately refer to its many rock writing TCPs. These are extraordinary cultural, historic, and sacred texts which Hualapai cultural scholars adept in this form of cultural literacy are able to read and explain for the tribe. Recent Hualapai rock writing studies need to be accepted with respect for cultural relativism and religious freedom and be integrated accordingly into the HPP.

According to Hualapai oral tradition, and as acknowledged by other Indian Nations, tribal neighbors, and traditional trading partners, Hualapai Bands are entrusted with having stewardship over the natural environment and resources within the traditional and ancestral Hualapai homelands and territory. The Hualapai Tribe has engaged in extensive trade, social, ceremonial, and diplomatic interactions, and occasional conflicts across its territorial boundaries before and during the historical era of contact with Euro-Americans. Initial research results indicate that Hualapais and other tribes

engaged in contact and exchange occurring across the Colorado River boundary in the vicinities of Diamond Creek, Granite Park, Lava Falls, Parashant Wash, Quartermaster Canyon, Separation Canyon, and Spencer Canyon. Further research is needed to expand on the understanding of these areas as TCPs.

Research results indicate references made to Hualapai elders who were adept at traveling on traditional Hualapai intercanyon networks of trails. Important places (i.e., "No Man's Land" and "Dr. Tommy's Mountain") named in the oral historical research can be better understood as to their possible status as TCPs by engaging follow-up investigations conducted by the Hualapai Tribe. Additional site visits with knowledgeable Hualapai cultural scholars are needed.

Similarly, site visits conducted on river trips confirmed that Hualapais traditionally practiced horticulture and farming alongside some sections of the Colorado River. Protection of these plants and their habitats is crucial. Further investigation is required in correlation to the successful efforts of Hualapai ethnobotanical studies. The Hualapai Tribe's cultural resources survey of culturally important wildlife would benefit from follow-up interviews and systematic site visits to the river corridor with Hualapai cultural scholars.

The Hualapai Tribe cannot accept the term "Cohonino" in its archeological usage as referring to a people not thought to be related to the Hualapai. Rather, the Hualapai Tribe maintains that the Cohonino are ancestrally-related to the Hualapai, as they are to Havasupai (and as understood by Hopi).

Encroachment and destructive impacts on locations and areas of cultural and historical significance should be forbidden by means of law, policy, regulation, implementation, and enforcement. Continued and enhanced efforts responsive to the recommendations of the Hualapai Tribe need to be made to ensure that any and all economic or technological developments or multiple use strategies bringing deleterious consequences to the Hualapai Tribe and/or the Grand Canyon will be prevented, or, if necessary, remediated. Mitigation of destructive impacts should be a management strategy for sites where previously unregulated or unrestricted developments or other activities have already encroached upon the Hualapai Tribe's cultural, environmental, and natural resources.

Determinations of Eligibility and Significance.—Hualapai cultural resource aspects of the environmental impacts of operations of Glen Canyon Dam correlate to natural resource bases from which Hualapai livelihoods are, and traditionally have been, derived. To the Hualapai, natural resources are cultural resources. The Hualapai Tribe exercises authorization, sanction, supervision, and review over Hualapai cultural resources research programs involving Hualapai populations (contemporary, historic, and ancestral) affiliated with Hualapai territories (traditional and contemporary), inclusive of the western Grand Canyon and the Colorado River. The Hualapai Tribe further authorizes, administers, monitors, and reviews a tribal preservation program for identification and description of cultural, historic and archeological resources, TCPs (inclusive of landscape, water, and natural resources use), and management.

It is recurrently problematic that criteria for eligibility and/or significance rely on Euro-American concepts and terms used by federal, state, and academic researchers in evaluating and determining the historicity and significance of sites and features. While ostensibly neutral, the interpretations of these

categories have often proved to be ethnocentric in practice, and thus inaccurate in the perceptions of Hualapai traditionalists and the Hualapai Tribe. It appears to be nothing short of racist that some scientists and historians—on whom the Federal Government relies to conduct, interpret, and review research—doubt the validity of the Hualapai Tribe's cultural scholars and the Hualapai Tribe's cultural-historical accounts. The problems are exacerbated when critics of the tribal research findings cast aspersions against Hualapai traditional practitioners as "maybe" being unreliable, mistaken, or forgetful. Complaints and accusations such as these are quite unfounded, and appear to be opinions held by non-Indian anthropologists who seem to think it within their prerogatives to harangue tribal research with veiled innuendo and unsubstantiated vagaries. Interpretations and conclusions such as these have no place in determinations of significance and eligibility, nor in review of historic and scientific research.

Hualapai cultural scholars, traditional cultural practitioners, and the Hualapai government need to consistently exercise an active, authoritative, long-term role in determinations regarding identification, description, monitoring, and management of Hualapai "sites," cultural properties, and resources. These processes should take place within the contexts of traditional and contemporary Hualapai cultural, political, social, religious, and economic systems. This requires discussions of any and all impacts to these sites and systems. This is not only mandated by legislation and regulation designed for the purposes of protection of Hualapai civil and property rights, it is also theoretically sound in terms of the conduct of scientific and humanities research.

Explanations and interpretations of Hualapai culture and history, from vantage points and perspectives outside of Hualapai culture, violate the multiple dimensions of authoritative peer review required by the grounded theory of collaborative research design. The authoritative role of Hualapai persons entrusted as "keepers" of knowledge (i.e., traditionalists, elders, and tribal cultural scholars, et al.), should continue to be upheld both on ethical and epistemic grounds. It is appropriate and necessary, therefore, that Hualapai cultural scholars continue to be actively engaged in the scholarly peer review processes regarding cultural resource surveys, research findings, documentation, reporting, establishment of criteria, and determinations of eligibility for listing in preservation measures.

To these ends, the Hualapai Tribe employs the following accepted, neutral, social scientific (historical and anthropological) research methods to evaluate the significance and eligibility for listing of TCPs:

1. Research conducted in Hualapai language, using Hualapai linguistic and cognitive categories.

2. Surveys among the associated Hualapai Bands or Clans as to their corresponding social and geographic experience with the TCPs.

3. Site visits and ethnographic interviews with Hualapai cultural scholars at places of past and present habitations, occupancy, and use.

4. Studies of culturally significant geography and geographic processes; ethnographic descriptions of landscapes, topography, geomorphology, and toponymy (place names in Hualapai language and in English); climatology; meteorology; micrometeorology; and hydrology.

5. Assessment of the past and present practices of traditional cultural events, social gatherings, and ceremonial activities (i.e., dances, memorials, worship, and family reunions).

6. Cultural communications and expressions through rock writing, structures, and other cultural materials such as projectile points, baskets, dolls, effigies, etc.

7. Surveys, inventories, assessments of natural resources (i.e., water, plants, wildlife, and minerals) and their distributions, and studies of their traditional uses by Hualapais:

- Ecosystems elements and linkages, ethnobotany (native and introduced plants' horticulture, harvesting, and processing), products (foods, medicines, tools, weapons, art supplies, and trade), species populations and distributions, and habitat characteristics.

- Ethnozoology (wildlife biology), species populations and distributions, habitat characteristics, hunting and fishing, traditional seasons, products (foods, medicines, tools, weapons, arts supplies, and trade), animal behaviors and communications (observable and symbolic).

8. Multiple methods investigation of Hualapai traditional cultural technology, production of material goods, trade, and exchange.

9. Research in Hualapai oral traditions, including origins/creation accounts, "mythology," "legends," folklore, storytelling, oral histories, and life experience narratives.

Navajo Nation.—

Methodology.—No information was provided by the Navajo Nation.

Strengths and Gaps in the Present Data Base.—No information was provided by the Navajo Nation.

Efforts Needed to Close Data Base Gaps.—No information was provided by the Navajo Nation.

Determinations of Eligibility and Significance.—No information was provided by the Navajo Nation.

San Juan Southern Paiute Tribe.—

Methodology.—No information was provided by the San Juan Southern Paiute Tribe.

Strengths and Gaps in the Present Data Base.—No information was provided by the San Juan Southern Paiute Tribe.

Efforts Needed to Close Data Base Gaps.—No information was provided by the San Juan Southern Paiute Tribe.

Determinations of Eligibility and Significance.—No information was provided by the San Juan Southern Paiute Tribe.

Southern Paiute Consortium.—

Methodology.—The Southern Paiute Consortium has identified TCPs in the project area through ethnohistoric research, field visits, and interviews and focus groups conducted on the Kaibab Paiute and Shivwits Reservations with members of the San Juan Southern Paiute Tribe. Information collected from these various sources was integrated through the process known as triangulation, where data from one source are confirmed by information collected elsewhere.

Strengths and Gaps in the Present Data Base.—The Southern Paiute Consortium recognizes that there is no one data base of information regarding TCPs. The Consortium maintains a computerized data base of information that is important to the preservation of Southern Paiute culture. Development of that data base was begun in 1995, and there is much information relevant to Southern Paiute history and culture. That archive is continually being expanded.

Efforts Needed to Close Data Base Gaps.—The Southern Paiute efforts to identify TCPs in the project area have been restricted to members of the Kaibab Band of Paiute Indians and the Shivwits Band of Paiutes because the aboriginal territory of these tribes includes the Colorado River corridor. However, due to intermarriage among members of the larger Southern Paiute Nation and the sharing of oral traditions among all ethnic group members, members of other Southern Paiute Tribes and Bands are likely to possess valuable cultural knowledge related to the relationship of the Colorado River corridor to Southern Paiute culture. Because cultural knowledge is unevenly distributed, some of this knowledge is likely to have been unrecorded to date. Future efforts to include these individuals will enrich the existing knowledge base.

Information about the relationships among tribes and ethnic groups is held by individual tribal members. Efforts to better understand these relationships will require collaborative efforts among the tribes that are signatories to the PA.

Southern Paiute ethnohistoric research has focused on published documents such as diaries and reports of government surveyors and explorers, military reports, and ethnographics. Additional research into unpublished diaries, especially of Mormon settlers in the region, is likely to provide new information about Southern Paiute occupation and use of the Colorado River corridor. Also, a complete study of Southern Paiute place names in the region will provide information about the process by which places become transformed into culturally significant landmarks and these become integrated into cultural landscapes.

Determinations of Eligibility and Significance.—The determination of eligibility for Southern Paiute TCPs needs to be made by knowledgeable Southern Paiute cultural consultants who, through oral history and the practice of Southern Paiute traditions, possess the teachings and knowledge that certain properties are of great regard to the Southern Paiute. Upon determination that a property is a TCP, the Southern Paiute Consortium makes a decision on whether or not to publicly document the TCP. The Southern Paiute Consortium requires that information concerning TCPs, released by the Consortium for incorporation into any data base that is accessible to the general public, must mask

information concerning the physical locations of the TCPs by giving only broad and obscure references to these locations. Reasons for eligibility to the National Register must be ambiguous and kept confidential.

Zuni.—

Methodology.—The Zuni Tribe has conducted river trips and hiking trips into the APE. These trips can by no means be considered anything other than an initial reconnaissance effort by the tribe. Only a small number of Zuni religious leaders have been on these trips and only a small portion of the APE has actually been visited. The trips have included religious leaders, archeologists, ethnohistorians, and wildlife biologists. The archeological data base has been reviewed as has the historical documentation of Zuni's relationship to the Grand Canyon. A report has been prepared and been made available as a result of the Reclamation program studies conducted by Zuni.

Strengths and Gaps in the Present Data Base.—The reliability of the data base for Zuni TCPs can only be known to the religious leaders, and this information is proprietary and confidential to them.

Efforts Needed to Close Data Base Gaps.—For Zuni religious leaders, there are no gaps in the data base. Simply by virtue of their existence, for example, even if their actual physical locations are not known, all TCPs are an integral part of Zuni religion, tradition, and culture. For Western-trained cultural resource managers, on the other hand, there are many gaps in the data base, especially if all the specific locational and other information is not present. These "management data base gaps" may be filled by the appropriate religious leaders, at their discretion, in culturally appropriate ways and on an as needed basis as determined necessary by the Zuni religious leaders. Any Zuni information or knowledge concerning a TCP is the intellectual property of the Zuni Tribe and may be restricted or released only under conditions set by the religious leaders and the tribe.

Determinations of Eligibility and Significance.—For Zuni TCPs, the only way a determination of significance can be made is by an appropriate religious leader. The Western approach of establishing set conditions for eligibility and significance of a property, as well as establishing fixed boundaries, is not appropriate for Zuni. From a traditional cultural perspective, fixed conditions and boundaries for a TCP are extremely difficult if not impossible to establish. Significance is context dependent and may change, for example, through time, by treatment, and by a particular religious leader's specific responsibilities for that TCP.

TCP significance is not just the physical aspect of the TCP; it is also defined as certain esoteric, privileged, and confidential information that may not be released to anyone other than the specific religious leaders entrusted with that information and knowledge. This type of information potential is radically different from the potential to yield information in the Western sense (see 36 CFR 60.4(d)).

In the Zuni way, any unrestricted release of esoteric, privileged, or confidential information and knowledge destroys the significance of the TCP and the significance of the knowledge itself. Consequently, this information and knowledge cannot be released to those who do not have the responsibility for its maintenance.

CHAPTER VII

Long-Term Research Goals/Domains

INTRODUCTION

Long-term research goals and domains form a framework that determines the types of data that should routinely be collected through monitoring, data recovery, and remedial actions. Research domains also determine how these data should be collected in order to address specific questions. All archeological work must be done in an overall research framework that complies with the minimum requirements set forth in the Secretary of the Interior's Standards for Archeology and Historic Preservation.

The first two sections of this chapter discuss two kinds of research domains: those targeting theoretical aspects of human occupation and use, and those concerning methodological issues. The theoretical research domain focuses on eight major research topics aimed at elucidating human use and occupation along the river corridor through the Grand Canyon. The methodological research domain focuses on research topics related to formation and erosion processes at work on cultural sites and the methodology of long-term monitoring, remedial actions, and data management. The PA signatories will review and re-evaluate the research priorities every five years at the time of the five-year synthetic report and review of the HPP. The final section of the chapter examines research as it applies to tribal needs and cultural views.

THEORETICAL RESEARCH DOMAINS

Based on our current understanding of human use and occupation of the river corridor below Glen Canyon Dam, eight major research domains have been identified. These are dating and chronometrics, demography and cultural affiliation, socio-politics and ideology, technology and industry, exchange and commerce, subsistence, transportation and communication, and government and dam construction. It is understood that these research domains are often closely linked and that research designs and data requirements on any given project should reflect this overlap; the same data may, and should be employed, to address multiple topics. In addition, many more specific topics could be addressed, and research emphases and decisions may change as research and our understanding of human occupation and use of the river corridor evolves. For now, the following domains will serve to identify the broad areas of research interest.

Dating and Chronometrics

Time is central to understanding virtually all aspects of both prehistory and history, not simply as a mechanism to locate or isolate events in history, but also as the focus of concern with process and diachronic change. The emphasis is not on "what happened," but rather on "how and why" regarding the transformations that turn the past into the present. The cornerstone of modern archeology is chronology; the placement of archeological remains, including sites, architecture, features, artifacts, and other manifestations of human occupation, into a temporal framework. The temporal dimension can be brought to bear on any of the other research topics by examining the topic through time. This allows for a more dynamic view of human behavior and adaption. Moreover, chronology and dating serve as a basis for understanding and addressing other research domains.

Over the past 90 years, the Colorado Plateau has served as an extraordinary laboratory for the development of archeological chronometry. Important advances came first from the development of tree-ring dating, then from some of the earliest applications of the radiocarbon method to archeological contexts. In recent years, comprehensive studies have been concluded on Black Mesa and elsewhere that fill in gaps, extend the chronometric envelopes, and provide theoretical and methodological advances in both radiocarbon and tree-ring chronometry (Dean 1969, 1978; Smiley 1985, 1992, 1993; Smiley and Ahlstrom, in prep.).

Therefore, identifying and building on our knowledge base concerning chronology in the Grand Canyon is a priority research domain. This would include creating a comprehensive list or summary of absolutely as well as relatively dated contexts. As the number of dated contexts grows, our knowledge of periods of occupation (or lack of) in the Grand Canyon can be addressed in a more precise and accurate manner. At locations with multiple dated features, issues of temporal sequencing and site growth can be addressed. Furthermore, chronological constructs developed from the surrounding regions can be examined to determine their applicability to the Grand Canyon.

Obtaining both relative and absolute dates is also critical for integrating the geomorphological history of the river corridor with its human occupation. The dating of river flood history is a specific topic that ties directly with the tempo and duration of human settlement on flood plains adjacent to the Colorado River.

A specific chronological problem applies to dating wood in the Grand Canyon. Jeffrey Dean, Francis Smiley, and Richard Ahlstrom, in the studies cited above, provide general models for the use of wood in both dendrochronological and radiocarbon dating. They relate the distribution of wood age in the regional wood biomass to the materials recovered from archeological sites. They give the archeologist a means for assessing the precision and accuracy of radiocarbon and tree-ring dates from questionable and solid contexts alike. They provide the foundation for building more accurate, higher resolution chronologies than could be developed previously.

The Grand Canyon province, however, contains growth and wood preservation microenviromnents that have not previously been systematically investigated. These include deep canyons at altitudes far below the average Colorado Plateau elevations as well as the riverine, waterlogged, driftwood environments known to cause spectacular archeological dating anomalies (Smiley 1985, Long et al. 1979). This specific research problem concentrates on developing parameters for wood age in the

environments local to the Grand Canyon province to make possible the accurate and precise radiocarbon chronometry of all sites, but especially the poorly represented Archaic and early agricultural (Basketmaker II) sites. This kind of research would improve the utility of the extant suite of dates, and would form the basis for the interpretation of all future dates on wood or wood charcoal. Since wood and wood charcoal constitute the only datable materials from many sites, the research will be of significant value to Grand Canyon chronology as a whole.

The research consists of the collection of representative wood samples from the natural biomass that provide age and growth history data to use in developing a wood age model. Research would focus initially on collecting appropriate wood samples (approximately 800 to 1,000 samples) for radiocarbon and tree-ring dating. Radiocarbon dates on previously recovered materials from sites and on any tested or collected sites would also be pursued. The process of dating archived materials requires detailed assessment of context, material quality and quantity, and comprehensive knowledge of the material archeological record.

In summary, the development of wood age and archeological date assessment models would fill a remaining major gap in Colorado Plateau chronometry. The outcome of this research would be a model useful for calibrating radiocarbon dates and other chronometric information, based on factors such as wood species. This research would provide the methodological means for obtaining more precise chronological control in an environment that is inherently challenging and difficult with respect to dating.

Demography, Settlement Systems, and Cultural Affiliation

Human use and occupation of the Grand Canyon, including the river corridor, has intermittently occurred over thousands of years by various cultural groups. In order to understand the nature of this use and occupation it is necessary to understand the demography of the region, how this is reflected through settlement and adaptive approaches, and how cultural affiliation is reflected through the archeological and historic record. Human demography within the canyon is essentially an issue of numbers of people, population structures, and the distributions of populations (i.e., permanent occupation, seasonal use, special use, and mobility). Archeological culture constructs are a useful tool in separating, at a general level, the differences between broad temporal use episodes and differing adaptive approaches; it is unclear how adequate they are at distinguishing similar adaptive uses by different ethnic groups. Because different groups may have used the canyon at different times, or contemporaneously used the canyon, the issues of demography and cultural affiliation become linked in research.

Demography and Settlement Systems.—Archeological research shows that few pre-Formative sites are present in the canyon. Very little evidence of Paleoindian occupation exists in the area. The Archaic period is primarily represented by isolated occurrences of rock art and caches of split twig figurines found in caves in the Redwall limestone. The use of the canyon during the pre-Formative period is inferred to be episodic, and perhaps related to hunting and ceremonial use (Fairley et al. 1994:98-99). Through the late Basketmaker and precolumbian Puebloan period, use, occupancy, and the numbers of people in the canyon and along the river corridor increased. Seasonal and special use of the canyon become more pronounced, and by the Pueblo periods it appears that

year-round occupancy coupled with a complete suite of agricultural technology is common. Year-round residential occupation of the canyon ceased by the end of the Pueblo II period, even though special uses were made of the canyon by Puebloan and other groups through to the present day.

As the precolumbian Puebloan occupation of the canyon came to a close, new groups began to have a presence in the canyon. The late prehistoric to historic transition can be directly linked to several modern Native American tribes (Fairley et al. 1994:110) including the Paiute and Pai peoples. Still later, Navajo and Anglo cultures began their association with the Grand Canyon region. Much of the use and occupation of the canyon during this period was seasonal and special use, resulting in ephemeral material remains.

In the archeological setting, pure demographic research is commonly a difficult proposition. Information regarding population structure, for example, birth and death rates, is commonly not readily available. Information from burials may be relevant, but is rarely statistically representative, though they are one of the best sources of information on general health and disease. Additionally, the very real concerns of present-day peoples as to the proper treatment of the deceased can also limit the potential utility of burials for addressing demographic issues. Instead, other lines of evidence can be brought into play to address broader questions of population structure.

Settlement system information such as seasonality, mobility, and duration of occupation can provide information important in demographic research. Most of the archeological research conducted to date in the Grand Canyon has focused on the archeological sites and other remains dating to the Pueblo II and III periods with occupation probably spanning between about A.D. 1050 to 1200 or perhaps 1225 (Fairley et al. 1994:106-108, Schwartz et al. 1980). An empirical issue bearing on the interpretation of Puebloan population within the canyon concerns the mix of mobility versus sedentism, and hunting and gathering versus agriculture. Major disagreements exist regarding the nature of Pueblo adaptation in the Grand Canyon, and the relationships between people within the canyon and above its rim.

Information concerning historic and protohistoric population structure in the Grand Canyon is obtainable from historic records and ethnographic analogy. Research focused on identifying site structure and distribution for known populations may have promise in generating models relevant to earlier periods. To some extent, this is the approach that has been taken in the development of hypotheses regarding canyon rim and corridor interactions during prehistoric periods. Demographic data may yield information on issues of Native American-Anglo contact, including incidences of cooperation, violence, and disease transmission. Of particular note might be evidence of Native American contacts with Mormons and with the United States Army. Within the recent historic period, research focusing on the duration of use, numbers, and origins of European explorers and pioneers may shed light on the westward expansion and the rationale for some of the early European forays into the canyon.

Cultural Affiliation.—An extremely important issue concerns the cultural affiliation of the many groups who used the canyon and left the material remains that we now regard as historic properties. Some of the research outlined in the HPP has great potential for resolving a number of issues surrounding the use of archeological data to infer cultural affiliation. Fairley et al. (1994:11-12) discuss the cultural affiliation of archeological sites in the canyon, noting the problems with archeologically defined cultural affiliation, and that Native American interpretations of cultural

affiliation may differ from those of archeologists. Any research designed to interpret cultural affiliation will require multiple perspectives. For example, it is all too common for archeologists to correlate the cultural affiliation of a particular archeological culture with a specific modern day Native American tribe, while other archeologists generically link an archeologically defined culture with a broader group of modern tribes that have similar lifeways (Fairley et al. 1994). Of course the links between the past and the present are often much more complicated than either of these approaches. For tribes, the issue is more often one of determining where their ancestors lived, and which clans and families may have occupied a site or an area in the past. In some cases, this can allow multiple claims to the same site.

When determining cultural affiliation, archeologists commonly work from the past to the present; tribes, on the other hand, work from the present to the past. Archeologists concentrate on the study of material remains; they organize the remains in time and space and develop concepts such as the Pecos classification. They then apply this classification to assign cultural affiliation, when it may or may not have any validity for this use. Archeologists also sometimes separate past cultures from present cultures, and this can affect any constructive efforts to determine cultural affiliation between past and present groups, as noted by Fairley et al. (1994:12). Tribes work from oral traditions. First they determine their ancestral area and what their traditional histories have to say about their occupation and use of that area; then they assess the archeological sites and their associated material remains in light of their traditions.

Clearly cultural affiliation is a research domain that requires multiple lines of evidence. Research designs must incorporate archeological and tribal research questions using a combination of approaches to address this research issue. Examples of research topics could include examining the origins of people in the Grand Canyon region, differentiating between Pai and Paiute sites, the relationship between the Cohonina and Puebloan groups, ethnic co-residence and differentiation within archeological "cultures," issues dealing with material remains as they equate to ethnic groups, and population mixing through time. An especially intriguing question concerns what appears to be multi-component sites that have both Pueblo and protohistoric or early historic remains. The specific temporal and cultural affiliations of individual features at these sites are unclear, as are issues related to the nature of the adaptive systems that they represent. Careful observations of surface artifacts and features, recovery of charred food remains, recovery of datable charcoal, and other studies are needed to sort out the horizontal patterning of precolumbian activities at such sites, and thus to discriminate them from the later protohistoric or early historic activity areas. Again, this points to the need for integrating the various research domains.

Socio-Political-Ideological Research

This theme focuses upon the diverse formal and informal structures such as family units or households, or extended households, polities, and ideology systems through which people express values and live their lives. Humans utilize both temporary and long-term movement, communication, and relationship systems in order to define, sustain, or reform these values, and to maintain or develop, for example, subsistence and technology within the human group, and to develop and maintain communication or trade, or provide protection from outside groups. Why people organize to transform their institutions is as important to understand as how they choose to do so. Thus, both the

diverse motivations people act on and the strategies they employ are critical concerns of social history. Ideology covers people's beliefs about themselves and the world they inhabit, and the ways that people communicate their moral and aesthetic values.

Some specific research topics and possible data types that could be used to address the topics include examining social, political, and ideological organization as a consequence of and reflected in architectural space. This would require information regarding architecture, stratigraphic relationship or temporal control, features, material culture, site structure, the control of space, and household and larger social unit organization. Using similar information classes, one could examine issues regardin the variation and complexity of domestic groups, and how these are integrated into the larger landscape. This in effect builds on the demographic-settlement research domain, seeking to derive social explanations to the patterning identified in the archeological/historic record.

An aspect of this research domain that has received little attention in the Grand Canyon deals with the political systems operant, as reflected through such data as regional site structure, special use architecture, distribution of exotic or trade goods, exchange among local domestic groups, other evidence of exchange of ideas (rock art, artifact style, etc.), and ethnographic information. Based on ethnographic information, political systems will likely be closely entwined with the ideological values giving rise to group self-identification cultural affiliation.

A particularly rich period in which to examine changing socio-political-ideological settings is during the transition period when Europeans began to have an impact on the Native American lifeways. The ramifications may be apparent in the social and cultural systems as well as in more mundane aspects such as subsistence, technology, and settlement patterns.

While there is considerable information regarding some of the individual explorations of the Grand Canyon region and the river corridor by early western explorers (i.e., Powell and Stanton expeditions), placement of these specific actions into the broader social and political precepts of the period may be a fruitful line of investigation.

Technology and Industry

This research domain encompasses the transformation of the natural world into items useful for human survival. The underlying concept of this theme is the knowledge base used in transforming the natural world. This knowledge base, however, is rarely recorded directly in the material record and must instead be inferred from the attributes of the material remains or obtained through ethnographic/historic sources. Many items on archeological sites retain evidence of the underlying technological or industrial processes that lead to their production. It is this information that is sought to be interpreted under this theme.

While information regarding technology may be regarded as an end in itself, the real value of this type of information is as a foundation for the larger issues of human adaptation and interaction through social mechanisms. Ultimately, technology is a product of a knowledge base that is culturally constrained, and hence provides information reflecting on the culture.

Prehistoric Period.—Virtually all prehistoric remains can provide information regarding some aspect of the technology that led to their production or use. Remains of structures can provide information on their construction and function; roasters and hearths may yield information on food production technology; tools yield information about not only their own production, but the technology of the processes for which they were used. Some specific topics of interest along the river corridor include technologies related to subsistence and resource procurement. Of particular interest is how this technology changes through time and among the different cultural groups who utilized the canyon. In this area, Native American interpretation and knowledge of processes can provide valuable insight into technologies represented in the artifactual record. Specific research problems concerning prehistoric technology might include the relationship between the kinds of ground stone tools in the river corridor and the intensity of food production, the identification of the tool kits associated with roasters, and information about how roaster tools and features were used in the processing of succulents both in the short term and over the long term.

Historic Period.—The technologies and industrial capacity brought to the Grand Canyon by Euro-American culture in the late 19th and early 20th centuries is one of completely different focus and of an exponentially greater scale than that of the preceding Native American experience. The Native American experience was essentially one of being at home and extracting the necessary requirements of daily life.

The early Euro-American experience was driven by not only the desire to explore and expand, but also by the motive of capital profit. These pursuits were not based upon the necessity of daily existence, but instead on the commercial development and or extraction of resources on a regional or national scale. Examples of these projects include prospecting and mining by individuals, schemes financed by consortiums of industrialists to build a railway the length of the river corridor, the stock (cattle) industry, the extraction of gold from the river by dredging tons of sediment, constructing bridges that would endure, the beginnings of a tourist industry, the initiation of engineering projects to build dams at various locations, and ultimately the construction of a single obstruction in Glen Canyon. There are 82 historic period sites in the river corridor between Glen Canyon Dam and Separation Canyon which may be able to shed light on these topics.

The examination of historic artifacts holds promise for technological studies through a number of avenues. The items may speak toward the industrial complex that produced them and the specific technological approach of those using them. Specific topics could be related to boat construction and maintenance and the approach taken to early river running. Similarly, the technology employed in construction and maintenance of trails, mining properties, and living quarters may reflect on the knowledge base at the time.

Exchange, Trade, and Commerce

This theme examines the way in which people and cultures interact as reflected through the material culture. This interaction can run the entire scale, from the movement of items across space through time with no preconceived goal of trade, to formal trading partnerships among groups that tie the

groups together, to highly impersonal commercial enterprises with the sole purpose of profit. Trade is often identified through the identification of non-local materials and goods, though it can also be detailed through ethnographic accounts and written documentation.

As with the previous research domain, even though the information obtained through the study of exchange and trade may be interesting in itself, our ultimate concern is the implications of that information toward larger issues of cultural adaption to the environment. However, exchange and trade provide an important focus for the collection of limited data sets that individually may not address the larger issues.

Prehistoric Period.—Exchange, trade and commerce are best reflected in the prehistoric period through the identification of intrusive materials and artifacts. This implies that the range of indigenous materials is known in order to differentiate the exotic resources and items from the local materials. Information regarding trade can be obtained through the identification and distribution of raw materials, as well as through technological and/or stylistic differentiation. All kinds of portable materials may be studied, but researchers often concentrate on rare or valuable resources such as shell, minerals, ornaments, and unusual kinds of ceramics. Tracers may be inherently coded into cultural items because of their place of origin. Raw materials in ceramics or specific geographically constrained plant or animal products are examples of this type of information. Virtually all classes of sites have the potential for informing on trade and exchange.

In the protohistoric and historic periods, interaction among the Native American groups and between Native Americans and Europeans can be examined through both tracing of raw materials and technological/stylistic differentiation, and through ethnohistoric investigations. This latter line of investigation provides a far richer source of information because it provides a social/cultural context for the exchange in addition to the simple information that it was occurring.

Historic Period (European).—Within the Euro-American experience of the last 130 years, the topics of exchange, trade, and commerce, as well as transportation and communication, are intertwined with technology and industry to the point of being completely merged. For example, when William Wallace Bass, entrepreneur, stockman, tour guide, hotel owner, trail blazer, and trader to the Havasupai, was determined to construct a cable car across the Colorado River, it took an act of Congress (House Rule 10411) in March of 1904 to enact such a project. Congress willingly obliged Mr. Bass' endeavor with the caveat, "that it must be operated and maintained for public use," and authorized Bass to collect reasonable fees for his services. Furthermore, free use by the government for its officers, employees, supplies, and means of conveyance was stipulated (Fairley et al. 1994:121). The government in Washington was very concerned with establishing a physical as well as legal presence in the Grand Canyon. This was done with an eye to the future which included a more direct control over the evolution of events in the river corridor, and the direction of timber sales and other commercial concerns on the surrounding rims. This scenario was commonly repeated in late 19th and early 20th century Grand Canyon history and politics.

Examination of material remains will provide one approach to assessing the amount and types of trade and exchange that occurred in the historic period. Historic documentation will provide a second avenue to pursue. Historic documentation is also a valuable source for placing the entrepreneurial enterprises into the broader development of the canyon tourist industry.

Subsistence

Subsistence is a theme that crosscuts many of the other research themes. In one form or another, all aspects of a culture tie into subsistence, whether they be the actual collection and processing of foodstuffs, or ideological systems that seek to maintain prosperity. Likewise, subsistence activities are reflected through a wide variety of cultural systems and remains. Settlement patterns may reflect aspects of seasonal resource use, feature and tool types may yield information on specific resource use, and changes in tools and features through time may reflect adaption to new resources which require different technologies to process.

The purpose of this research domain is to clarify the nature of human adaptation within the canyon by judicious collection of archeological materials relevant to reconstructing subsistence practices and seasons of occupation. Although sites within the river corridor have previously been excavated, much of the work was done before the development of modern methods of paleoethnobotanical analysis. Test excavations and the recovery of charcoal rich samples from selected features, such as roasting pits, could provide materials useful for inferring subsistence practices, temporal affiliation, and seasons of site occupation or use.

Basic information on subsistence can be recovered from a variety of contexts that are present in the canyon. Samples yielding information on culturally utilized plants and animal resources can be recovered from many classes of archeological features, though those used in production (i.e., agricultural features), storage (i.e., granaries, caches), processing (i.e., hearths, roasting features), and discard (i.e., middens, latrines) may be the richest. Ethnographic information is a particularly rich source to draw on. Current knowledge of resource use by traditional people within a given environment can be used directly, or through analogy, to provide a basis for interpretation of past resource utilization. Finally, historic records and accounts can provide direct information on subsistence in the recent past. In all cases of archeological data recovery, samples for macro- and micro-botanical and faunal analysis should be collected to provide information on subsistence.

Of special interest, because of the potential ramifications on virtually all other aspects of social and cultural organization, is the transition from a mobile, hunting and gathering lifeway to a more sedentary, agricultural adaptation. It has been noted that the Grand Canyon generally lacks material remains that can confidently be assigned to the period of agricultural transition in the northern southwest, traditionally referred to as Basketmaker II. The Grand Canyon environment, varied though it may be, differs markedly from the topographic, hydrologic, and edaphic environments of the greater Colorado Plateau. Just as the Colorado Plateau required early agriculturalists to solve farming and foraging problems in new ways, so did the Grand Canyon. Grand Canyon agricultural adaptations during the period 2000-3000 B.P. may have led to organizational and subsistence innovations unique to the canyon itself.

The current state of knowledge of early farming in the canyon stands where the Greater Plateau situation stood about a decade ago when we had little coherent chronometric data (Smiley 1993). The small sample of potential Basketmaker II sites, the even smaller sample of dates from the sites, and the fact that nearly all of the dates are on wood charcoal, limits the extent of even the most

resourceful and creative inference. Fairley et al. (1994:100) have raised the problem that the basic nature of early Grand Canyon agricultural societies remains undefined, undated, and undifferentiated from the potential Archaic groups that may have existed contemporaneously.

Knowing the articulation between the highly mobile early Basketmaker peoples of the White Dog phase and the groups in the Grand Canyon will fill a critical void in our understanding of the agricultural transition across the northern southwest. Establishing the connections will also help bridge the gap between the chronology and organizational structure of groups north of the Colorado and San Juan Rivers and the groups in the Four Corners area. This research domain should concentrate on obtaining datable materials from features at pre-ceramic sites that show the likelihood, based on stratigraphic position and diagnostic artifacts, that they date to late Archaic or Basketmaker II times.

Another issue bearing on the interpretation of sites within the canyon concerns the mix of mobility versus sedentism, and hunting and gathering versus agriculture. There exist major disagreements regarding the nature of adaptation in the Grand Canyon, and the relationships between sites within the canyon and above its rim. An especially intriguing question concerns what appear to be multi-component sites that have both prehistoric and protohistoric or early historic remains. These sites often have hearths, roasting pits, and other features showing fire-cracked rock and charcoal. The specific temporal and cultural affiliations of individual features at these sites are unclear, as are issues related to the nature of the adaptive systems that they represent.

It is possible that the early groups were using the river environment in much the same ways as later Native American groups, but it is also possible that early use of precisely the same points on the landscape (i.e., those areas we refer to as "sites") were quite different from later groups in terms of subsistence, activities, and seasons of occupation or use. Careful observations of surface artifacts and features, recovery of charred food remains, recovery of datable charcoal, and other studies are needed to sort out the horizontal patterning of early activities at such sites, and thus to discriminate them from the later protohistoric or early historic activity areas.

There exist major unresolved questions regarding the nature of activities at individual sites within the canyon that have been classified as protohistoric or early historic. Some of these issues are at the most basic level of archeological interpretation. For example: What is the horizontal patterning of activities? What were the seasons of occupation or use? What foods were processed and consumed at these sites? Answering such questions should clarify the role of these sites in much larger systems of subsistence and settlement, and thus make clear the ways in which prehistoric and historically documented Native American groups were similar or dissimilar.

This research might also clarify the extent of territorial boundaries and how these might have changed through time. Since European contact, there have been major disruptions of Native peoples' activities in and around the canyon. Protohistoric and historic age sites within the canyon provide important and unique material evidence of these changes, and supplement historic accounts which are sparse to begin with and often incomplete. There is much potential to add to the record of how historically documented Native American groups were able to live in this exotic and harsh environment, and how Euro-American contact changed the traditional lifeways of these groups.

As currently understood, Anglo subsistence in the Grand Canyon was based primarily on exotic materials brought into the canyon, rather than on indigenous resources. The degree to which this is true may be an interesting research focus that could be examined at historic sites and through historic documentation. Remains associated with the stock industry may reflect another aspect of historic subsistence in the region.

Transportation and Communication

This theme relates to the movement of people and ideas across the landscape. It is most directly reflected in the routes that were employed for travel, be they a byproduct of the travel itself (i.e., a path), a constructed route (i.e., trails and cableways), or constructed communication lines. Obtaining information regarding communication during prehistoric periods must be inferred through proxies such as common styles and trade.

This theme can be addressed through a number of data classes. The most obvious are trails, cross-canyon routes, and information related to historic ventures (see "Government" below). Distribution of stylistic, architectural, and other physical traits may be an appropriate means for identifying communication. Ethnographic information can be readily employed to look at transportation routes and identify spheres of communication.

Government

Although the Federal Government supported the Powell expeditions of 1869 and 1871 and maintained a congressional watch over development of the region in the late 19th century, governmental direction and control came relatively late to the canyon proper. A portion of the river corridor came under the direct auspices of the government when Grand Canyon was designated a national park in 1916. Subsequently, throughout this century additional lands and segments of the river corridor have been added to the national park and thus have come under further federal jurisdiction.

The Reclamation Service, as organized in 1902, and which evolved into the contemporary Bureau of Reclamation, has had a direct impact on the Colorado River as it flows into, through and beyond GRCA since its inception. The NPS oversees and administers the day-to-day operations of the park and hence the river, but it is Reclamation that controls the water and as such controls, to a degree, what happens to the portions of the park touching the river.

This control is the result of Glen Canyon Dam. Completed in 1963, Glen Canyon Dam is the culmination of a long and controversial process begun in the last century and fine-tuned during the 1920s. This government agency's mission was to create a viable system for storage and delivery of the surface waters of the western United States. Over the decades, numerous dam sites have been selected, studied, and abandoned within the park; Bridge Canyon, Whitmore Canyon, and Marble Canyon to name a few. Today, the remnants of these projects can be seen along the river corridor as the relics of engineering projects; the legacy of 20th century life.

Presently, a complex system of dozens of dams interrupts the natural flow of the Colorado River between the Rocky Mountains and the Gulf of California. Dams are a fact of modern life on American rivers. Volumes have been written on their construction, operations, and repercussions. John Terrell (1952) described the system as "the Western Web" before work on Glen Canyon Dam was even begun. Glen Canyon Dam, located within GLCA, 15 miles above the start of GRCA, is an integral part of that system and will continue to have a pervasive effect on the resources located downstream.

Perhaps the best data source concerning government association with Grand Canyon sites can be obtained through documentary sources. Information on the role and changing philosophy of the government in the exploration, development, and preservation of the Grand Canyon is important for the context of early exploration and exploitation. It also figures prominently into interactions with the Native American inhabitants of the region.

METHODOLOGICAL RESEARCH

This section is divided broadly into three themes: formation and preservation of the archeological record, monitoring technologies, and remediation technologies. Methodological research topics concentrate on site formation processes and sedimentology. In addition to these research topics, several important topics are concerned with the methodology of monitoring and stabilization/erosion control. These monitoring topics provide the information necessary to inform and direct future research and management. Each of these is further subdivided into more specific topics. Data management efforts needed to track and integrate research domains are discussed in Chapter IX.

Formation and Preservation of the Archeological Record

Site Formation.—This research domain deals with how sites are formed through time and how natural and cultural processes both build and collapse the archeological record. Areas of interest include the underlying processes that have formed the cultural landscape, an enhanced understanding of the dynamics that cause erosion, the effect of prehistoric floods and droughts on the archeological record of site occupation, the tempo and reasons for site abandonment and reoccupation, and research into the ways that people and fluvial and aeolian geomorphology have interacted to create archeological sites. What we recover through survey and excavation is the "archeological context," "materials that have passed through a cultural system, and which are now the objects of investigation of archeologists" (Schiffer 1976:157-158). Site formation consists not only of the interaction between physical and geomorphological processes with cultural processes, but also of the ways artifacts and features are reused through time by the same or different cultural groups, and the ways that both cultural and natural deposits interact to form the archeological record we see today.

Pertinent to the study of site formation processes is additional research on isolated occurrences. These occurrences consist of individual artifacts or small groups of artifacts or features that have no apparent relationship to known archeological sites but are part of the cultural landscape. Of all the aspects of the river corridor and its cultural history, the meaning of isolated finds is least understood and potentially most important. These occurrences may be the only surface indications of buried

sites, or they may represent similar or completely different activities from those that typically occur on site. Additional laboratory analysis of the character and context of isolated occurrences recorded during the 1990-1991 inventory will begin to indicate whether test excavations should be conducted at these locations in order to search for buried deposits, or whether these locations represent only surface manifestations. Analyses will also begin to indicate the kinds of activities represented by isolates. Newly discovered isolated occurrences should be mapped and recorded and the information should be added to the cultural resources data base.

Site Erosion/Sedimentation.—This research domain specifically requires integration of GCES data on sedimentation and erosion, with archeological data for refinement of the site erosion/sedimentation model developed by Richard Hereford and others. Two topics are included: (1) the development of terrace deposits bounding the river and an examination of long-term cycles of building and erosion that may greatly bias our perception of occupation in the Grand Canyon, and (2) understanding the current erosion that is occurring at cultural sites throughout the canyon.

The first topic places the current erosional state into a long-term context that may have implications for management goals. A key to this research is the dating of sediment deposits. Efforts should be made to obtain samples whenever possible that can add to the strength of the chronological sequence. Additionally, environmental and climatic data will be essential to understanding the long-term geomorphological trends. Some data already exist through GCES and these data need to be synthesized with cultural resources data and made available to cultural resources researchers.

The second topic concentrates on the current erosion cycle, its relationship to the dam and its operation, and how operations may be employed to reduce the rate of erosion. Research is needed to examine both pre-dam erosion/sedimentation and post-dam erosion/sedimentation. Erosion and sedimentation should be measured on and around sites and contrasted with those from off-site areas. Research that incorporates the effect of daily/hourly dam operations; high-flow events; extreme drought conditions; and flash floods on river tributaries, arroyos, and gullies should be encouraged. The data on hydrologic/stage changes need to be linked more clearly with the cultural resources data.

Paleoenvironment.—Paleoenvironmental variables, including climate, can contribute to our understanding of past cycles of erosion/deposition. Plant and animal remains from archeological sites can provide important clues about past environments, as well as address seasonality and resource utilization issues important to archeologists. These same remains may also provide clues to the presence and distribution of native species prior to the recent habitat disturbances. Paleoenvironmental sampling should include dendrochronological and flotation samples, pollen and phytolith samples, animal bone, shell, and other organic remains. Additionally, more work with packrat middens may produce important results. Because of the broad implications of paleoenvironmental data, collection of paleonenvironmental samples should be a priority in contexts likely to produce valid results.

Natural Resource Mapping.—The purpose of this research domain is to produce natural resource maps for the river corridor based on extant GCES research on the availability of arable land, stone and clay resources, and wild plant and animal resources. Such maps will form the baseline for the variability of human use of the river corridor through time. Of particular interest is the mapping of agricultural fields through pollen or phytolith analysis. Much of this information may already be

available, but it needs to be synthesized into a format that can be easily used by cultural resources researchers. All data need to be linked via geographic network to facilitate geographic comparisons within the river corridor and to allow for the recognition of strong patterns in the data.

Monitoring Technologies

Innovative Recording and Monitoring Practices.—The purpose of this research domain is to first examine and improve methods used to record cultural resources information, whether archeological sites, natural resources, or other important aspects of cultural knowledge, and secondly, to examine and improve methods for monitoring cultural resources. Recording of individual sites is currently accomplished through a verbal description, a site map, and photography. Methods that maximize information potential and accuracy, while minimizing impacts to the sites and cost of recording, should be encouraged. This may involve remote sensing technologies in combination with current practices. Examination of the types of data required to meet management and professional needs should be evaluated in order to match the appropriate technologies.

Research that refines and quantifies site monitoring practices should be encouraged. This research domain should result in ways to quantitatively measure differences between monitoring episodes and in ways to identify the causes of those differences. Research could, for example, concentrate on ways to best employ the extensive existing photographic records from stationary cameras without expanding that area of monitoring, ways to decrease the impacts of monitoring itself to sites, ways to increase the efficiency of monitoring and lower the cost, and ways to use information gathered through monitoring to address other research questions. Research could range from small scales such as the monitoring of artifact movement to large scales such as the monitoring of riverbank slumpage or debris flows.

One innovative approach may be to examine photogrammetry software for a qualitative look at site integrity through time, specifically focussing on the impacting agent through high clarity negatives and exact photograph replications. This would call for an increase in medium format photographs and semi-permanent photograph points so near replication could be achieved every time.

Remediation Technologies

Research that measures and refines the effectiveness of remedial actions is an important goal of the Cultural Resources Program. Sites needing remedial actions have been prioritized through a combination of information about site damage plus a ranking of their research and traditional value. GRCA, GLCA, and tribal groups all have various remedial actions in place at archeological sites. Quantification of their effectiveness over both the short- and the long-term is necessary for effective long-term management. Research on where and how best to control erosion at sites is encouraged. Through monitoring of the remedial actions, we will gain a better understanding of the effectiveness and limitations of the various remedial approaches. Therefore, we will be in a better position to evaluate which remedial approaches will be most effective in a given situation.

ETHNOGRAPHIC/TRIBAL RESEARCH PROGRAMS

Tribes have long-term and customary affinity with the Grand Canyon as evidenced by ancestral and recent residence, occupancy, use, traditional cultural practices, ceremonial activities, religious beliefs, oral traditions, and social knowledge.

Grand Canyon landscapes and waters are locations of traditional and contemporary tribal activities and homeplaces of historical and cultural significance. The Colorado River system has been subject to long-term, aboriginal use by tribes; the Colorado River system, including its associated tributaries, seeps, springs, and washes, providing the life-giving waters sustaining various tribes in their diverse ancestral and contemporary homelands. The land, waters, geographical features, plants, and wildlife are intimately related to—and in many cases are in fact themselves—TCPs and cultural resources.

The goals of the tribes' research projects undertaken in collaboration with the Department of the Interior are to record accurate accounts of traditional cultural knowledge to promote understanding about tribes' cultural and natural resources. These accounts also convey tribal concerns regarding impacts of the operations of Glen Canyon Dam upon the tribes' people, culture, and resources.

The tribes' survey research projects yield a data base of documentary records of their cultural resources and practices. The tribes' surveys are of further value for interactions with government agencies and public and private institutions in efforts to seek effective implementation of laws and policies, protection of cultural resources, and long-term sustainable uses of cultural and natural resources.

Research methodologies are designed and conducted in ways that adhere to traditional cultural customs and values, in compliance with protocols of tribal governance. Effective research methods acceptable to a tribe (and preferred by tribal members) are used as cultural research is conducted within the context of the tribes' population.

CHAPTER VIII

Monitoring and Remedial Action Plan

INTRODUCTION

The development of a MRAP was identified as Stipulation 2 in the PA. The MRAP was developed and finalized in August 1994 and has guided the implementation of monitoring and remedial actions since that time. The HPP called for in Stipulation 3 of the PA incorporates and supersedes the original MRAP.

This section of the HPP guides the ongoing process for all aspects of identification, monitoring, and remedial actions with regard to cultural resources impacted, or potentially impacted, as a result of the operation of Glen Canyon Dam. It is divided into two distinct, though interrelated, sections: those associated with the ongoing monitoring activities aimed at identifying, quantifying, and understanding the erosional processes that are operating on the cultural resources, and those directed at remedial actions to mitigate adverse effects of the operations of Glen Canyon Dam on the cultural resources.

MONITORING

Purposes and Goals

Data Collection in Support of Evaluation of Impacts to Historic Properties Located Within the Colorado River Corridor.—The fundamental goal of the monitoring program is to collect data that will be used to identify potential and ongoing erosional impacts to significant cultural resource sites along the Colorado River between the river and the pre-dam flood zone at approximately the 300,000 cfs level.

Two categories of threats have been defined based upon their relation with Colorado River flows (Fairley et al. 1994). They are as follows:

- Adverse impacts such as inundation or bank cutting directly caused by the river, downcutting of peripheral arroyos due to lack of sediment replenishment and a continuously lower base level for the river, and/or modified recreational use patterns caused by river flow regimes.

- Potential adverse impacts to sites as predicted by the geomorphic model of site erosion (Hereford et al. 1993).

Monitoring of these sites will be used to guide and initiate the appropriate preservation measures aimed at preserving the sites *in situ*.

Development of a Predictive Model of Geomorphic Processes Related to Archeological Site Erosion.—Geomorphological processes define the environment in which the cultural resources are found (i.e., Hereford et al. 1993). Predictive models of where erosion occurs will be developed which will result in more efficient monitoring, the potential for early remedial intervention, and potentially reduced loss of irreplaceable cultural resources.

Implementation of Appropriate Remedial Actions Related to Documented Site Impacts, Monitoring, and Evaluation of Effectiveness of Procedures.—At those sites that have had or may have adverse impacts, remedial actions will be required to mitigate the effects of these impacts. As this will rarely include complete excavation (data recovery) of cultural deposits, monitoring of the remaining *in situ* cultural materials will be necessary in order to evaluate the effectiveness of the remedial strategy.

Selection of Sites for Monitoring

In order to address all three of the above goals, a monitoring program will be implemented to evaluate impacts on sites, record where erosion is occurring, and collect information that will be used to prioritize and plan for remedial actions. The tribes are responsible for selecting and monitoring their respective TCPs. The NPS and Reclamation are responsible for monitoring archeological sites recorded during the 1990-1991 inventory.

All archeological sites to be monitored will be selected from the group of 475 sites identified as part of the archeological inventory of the Colorado River corridor. A total of 336 sites comprise the number of properties that are either impacted or potentially impacted by river flows (identified as the "I" group). Within the "I" group, 263 sites exist on sediment deposits subject to erosion (identified as the "SI" group).

An additional 139 sites comprise the number of properties located along the river corridor but outside the APE (identified as the "N" group). These sites will provide a control group for comparison with those sites in impact categories. A ten percent sample will be chosen from the "N" group at random and monitored every three years. The remaining sites within the "N" group will not be monitored.

Every site in the "SI" category will be visited once by the end of 1997 in order to define the appropriate monitoring frequency for long-term monitoring. The remaining sites within the "I" category will also be monitored at least once by the end of 1997 to define their appropriate long-term monitoring frequency.

Annual Selection of Sites for Monitoring.—Each year, the priority for selection of sites to be monitored will be dictated by the following:

- All sites within the "SI" group which are known to be losing important archeological deposits because of active erosion and which have received or are targeted to receive remediation will be monitored at least once a year. Sites "losing important archeological deposits" refers to sites losing features or midden deposits, and which are therefore high priority candidates for data recovery and/or remedial action. Monitoring the sites that have received remediation is vital to evaluating the effectiveness of remediation strategies.

- Sites which have high potential for adverse impacts due to non-geomorphological factors such as changes in river camp or visitor access locations that have resulted from changing flow regimes will be monitored as needed. This category also includes sites which may be affected by non-cultural resources research activities such as geomorphic mapping or high-flow sediment deposition studies.

- Sites which have been identified by any of the tribes for specific tribal concerns will be either monitored at the level requested by the individual tribe, or monitored by the tribe itself as part of its monitoring program (see "Tribal Long-Term Monitoring Programs" below).

- Sites located in areas of potential impacts as predicted by the geomorphic model(s) of site erosion will be monitored. Monitoring of these sites will be used to guide the appropriate measures to preserve the sites *in situ*, i.e., to plan for site stabilization when site loss is anticipated, but before it is observed.

By the end of fiscal year 1997, all sites will have been monitored at least once. The NPS will make recommendations in the fiscal year 1997 annual report regarding the need and frequency of future monitoring at each site for consideration by the signatories. The signatories will have the opportunity to review these recommendations, as described in the "Annual Reports" section below.

Lead in Site Selection.—The NPS will take the lead in the annual selection of sites to be monitored, taking into consideration the above criteria and other logistical constraints. The listing of proposed sites along with the rationale for their selection will be incorporated into the annual report and sent to the other signatories for review, modifications, and additions. Tribal input on traditional cultural sites that need to be monitored will occur at this time. The listing, as well as the rationale for selection, will be completed in time to be included in the annual report.

Modification of Site Selection.—Site selection may be modified in the future contingent on specific data requirements identified in the research domains, unanticipated events, or at the request of any of the signatories to the PA.

Site Monitoring Methodology

Site Recordation.—

Mapping.—All sites to be monitored have been mapped to scale with tape (or measured paces) and compass, or otherwise recorded from permanent datum points. High resolution topographic

mapping with a total station is a means to establish baseline conditions and measure geomorphic change at sites. Applying the priority categories from the site selection process for monitoring, the following priority order for total station mapping is to be followed:

- All sites that have remedial actions in place or are targeted to receive remedial actions
- All sites requiring semi-annual or annual monitoring
- Thirteen sites from the control group (ten percent of the control group sites). These sites will be chosen with regard to the convenience and impact of mapping, since they will need to be remapped in the future

Mapping will be an ongoing process in the long-term monitoring program as it is expected that additional sites will be continuously identified that meet these criteria and added to the mapping effort. Included in the maps will be features, artifact concentrations, diagnostic/exotic cultural material, significant natural features, erosional features, and datum points for photo-referencing when applicable. Maps will be generated to a degree of topographic resolution and accuracy to be able to identify and quantify erosional changes, generally a 0.25-meter contour interval or better. Where feasible, the control points of each site will be tied into geographic information system (GIS) networks managed by the NPS and GCMRC.

At all sites where total station maps are generated, repeat mapping will occur within five years for comparative purposes. More frequent repeat mapping will occur on an as needed basis for those sites receiving remedial action and those sites on a semi-annual or annual monitoring schedule. Where monitoring results document that a measurable amount of change has occurred, sites will be remapped as needed to measure volumetric change. Not necessarily the whole site needs to be mapped, rather mapping could be concentrated in only those areas that have undergone change.

Monitoring Forms.—Archeological site monitoring forms have been developed by the NPS in consultation with the other PA signatories (Appendix F). These forms will be completed for each site during monitoring to establish a diachronic record of qualitative and quantitative change at the site. Should changes in the monitoring form or recording methodology be suggested through advances in knowledge or technology, the NPS will consult with the PA signatories prior to making the changes.

Photographic Documentation.—Photographs (normally 3x5-inch black and white photographs) will provide an objective basis for visually documenting change. Previous photographs will be duplicated as accurately as possible so that visual comparisons can determine whether change has occurred. For black and white medium format photographs, a semi-permanent datum, whose location is plotted on the site map, will be used to relocate photograph positions.

Aerial photographic methods will be employed to document change where appropriate. Pre- and post-dam aerial photographs may be examined to identify the development of drainage systems affecting sites in the river corridor.

Long-term photograph replication using historic photographs will be employed to document change. These photographs can provide a visual time sequence of how subtle changes noted by site monitors

through time can become impacts worthy of remedial actions. Many historic photographic resources (including photograph archives and early NPS photographs) are available and will be utilized as appropriate.

Other Monitoring Methodologies.—Other monitoring methods may be employed when appropriate or available.

Logistics

Downriver Monitoring/Remedial Action (Grand Canyon).—

Number of Monitoring Trips.—A minimum of four trips per year will be required to adequately complete the site monitoring/remedial action agenda. Additional trips may be arranged for any remedial actions or to review concerns of the various agencies and tribes. The seasonality of events in the river corridor (visitation and vegetation) determines that the optimum time to undertake the monitoring trips is the period from mid-September through April. Considering the inadequate hours of daylight and the cold temperatures in December and late winter, trips would be best suited to the fall and early spring. It is estimated that approximately 100 archeological sites can be monitored per fiscal year. A range of 60 to 75 river days annually can be expected dependent on trip duration.

Duration.—Trips will generally run ten to 18 days.

Field Crew.—Each trip will be directed by a qualified NPS archeologist. Qualification as an NPS trip leader will require a minimum of 60 days of river corridor monitoring experience between Glen Canyon Dam and Separation Canyon. The monitoring field crew for archeological sites may be drawn from the NPS, Northern Arizona University cooperative agreement staff, PA signatories, and other public or private sources. Tribal monitoring crews will be selected by the tribe conducting the monitoring trip. Reclamation will provide professional staff to assist with both monitoring and remedial actions when appropriate or requested by the signatories.

Upriver Monitoring/Remedial Action (Glen Canyon).—

Number of Monitoring Trips.—Upriver (Glen Canyon Dam to Lees Ferry) trips will be accomplished as necessary based upon the number of sites to be monitored and any detailed examination of terrace arroyos, documentation and photography of major cutbank areas, and implementation of remedial actions as discussed below. Any sites located within lands identified as Navajo Nation will be monitored specifically in consultation with Navajo Nation representatives. Any collection or ground disturbing activities at sites on Navajo land will take place only with the prior written authorization of the Navajo Nation. Sites included within these lands are AZ:C:2:11 (F. 5,6,14), AZ:C:2:12, AZ:C:2:41, AZ:C:2:48, AZ:C:2:57, AZ:C:2:58, AZ:C:2:59, AZ:C:2:60 (F. 1, 2, 4, 6, 7, 8), AZ:C:2:72, AZ:C:2:76, AZ:C:2:78, AZ:C:2:82, AZ:C:2:86, AZ:C:2:87, AZ:C:2:90, AZ:C:2:91, AZ:C:2:99, AZ:C:2:100, AZ:C:2:106, and AZ:C:2:108.

Duration.—Trips will be run on a day-to-day basis from Lees Ferry throughout the monitoring period, with single day trips being the norm.

Field Crew.—Each trip will be directed by a qualified NPS archeologist, with trips being conducted from spring through fall of each year.

Signatory Participation.—Signatories to the PA may accompany any monitoring trip if they so request and if trip logistics can accommodate them. Requests should be received by the NPS no later than one month prior to trip launch.

REMEDIAL ACTIONS

Purposes

Remedial actions will be undertaken when the monitoring identifies adverse impacts to significant cultural resources. The type of action will be based on the scope of impacts and will be developed in an interactive atmosphere through the reporting, consultation, and coordination procedures described below. After discussion with the PA signatories, it may also be appropriate to take no remedial actions at a location based on traditional cultural values. If the remedial action includes any form of data recovery, the recovery and analysis of the data will be guided by the research domains discussed in Chapter VII.

Potential Remedial Actions

Potential actions to mitigate impacts or potential impacts identified during monitoring may include one or more of the following:

- Redirect or remove existing trails.
- Develop for public interpretation.
- Close site to public.
- Remove graffiti.
- Construct checkdams.
- Vegetate or re-vegetate areas.
- Stabilize banks with rock armor or similar technique.
- Stabilize structures.
- Collect artifacts.
- Conduct subsurface testing and/or partial data recovery.
- Conduct complete data recovery.

When a remedial action is identified as necessary through the monitoring program, a written proposal will be prepared for review prior to implementation. The scope of the proposal will be commensurate with the complexity of the proposed action and may be included in the regular monitoring reports or

prepared as a separate document. Two of the more labor intensive and commonly utilized categories of remedial approaches are discussed in detail below.

Stabilization

Based on the NPS policy on *in situ* preservation and the identification of *in situ* preservation as a primary management target by the AMP stakeholders, stabilization will be the first course of action to prevent site impact when erosion is threatening the integrity of deposits. Guiding this approach will be an attempt to minimize human impacts to the sites while achieving a satisfactory result. Stabilizing elements will be constructed of local materials so as to maintain the natural appearance and not significantly alter the site. When possible, structures (i.e., checkdams) will be constructed outside of site boundaries. When possible, traditional approaches to counteracting erosional processes will be utilized, preferably under the direction of traditional specialists such as members of the Zuni Conservation Program.

All stabilization features will be located on the site map, when inside the site boundary, or in relation to the site. Stabilization features will also be located on the appropriate 7.5 minute topographic map. Written and photographic documentation of the work will likewise be performed. Locations that have received stabilization will be a priority for monitoring in order to ascertain the effectiveness of the remedial approach.

Testing/Data Recovery

The recovery of information from cultural deposits will be the last resort approach toward mitigating adverse effects to cultural resources in the canyon. At least in part, the information that these sites can contribute to our understanding of the past makes them eligible for listing on the National Register. Loss of this information is contrary to the goals of preservation when *in situ* protection is no longer an option. It is imperative that data recovery be approached with a clear understanding of the types of research questions that the action can address, so that maximum information about human use and occupation of the canyon can be obtained. The research domains identified in Chapter VII should guide the overall data recovery effort.

When conducting data recovery or other actions that may disturb cultural deposits, a proposal will be prepared that will address the type of work to be undertaken and the methodology to be employed. The proposal will include but not be limited to the means for achieving locational control, the excavation techniques that are to be employed, artifact and sample collection strategies, artifact analysis, and post-work site remediation. The proposal will also specifically identify how the research will address the research domains identified in Chapter VII. Proposals and reports detailing results will be incorporated into the consultation and review processes described below.

Consultation Process Prior to Remedial Actions

Standard Situation.—When possible, consultation will occur in the form of review and comment on the trip reports and annual reports, as described below. Activities necessitating a separate proposal will be submitted to all signatories for a 30-day review. If no comments are received by the party submitting the proposal, the proposed action may be undertaken. If there are comments, these will be incorporated into the proposal, or a formal response will be prepared and distributed to all signatories discussing why the comments are not being incorporated. Meetings may be scheduled in lieu of the preparation of a formal response to discuss and resolve issues.

Emergency Situations.—Where circumstances may cause a resource to be lost in the length of time it would take to follow the normal proposal writing preparation and review process, or if vulnerable resources are identified outside of the normal monitoring processes, the land managing agency or the land managing tribe should remediate the resource as they deem appropriate. The other signatories should be notified prior to the action, if possible, or as soon after the action as feasible.

Implementation.—The implementation of the remedial actions will occur following completion of the consultation process discussed above. For situations where the resources are not in immediate danger of being lost, the remedial actions will occur as can be scheduled. For situations requiring specific equipment, personnel, or logistical considerations that would make their implementation unfeasible during normal monitoring trips, the proposed scheduling will be provided in the proposal.

REPORTING, CONSULTATION, AND COORDINATION PROCEDURES

Trip Reports

Trip reports will be prepared by the NPS, with input from tribal representatives, when appropriate, following each of the monitoring trips. For the upriver section of Glen Canyon, a minimum of two interim monitoring reports will be prepared for the season.

These reports will summarize the actions taken on the trip including sites visited, changes that have occurred at the sites, effectiveness of previous remedial actions, and any unanticipated remedial actions that were undertaken. In addition, a section recommending remedial actions that are needed at each site will be provided. Sensitive information related to TCPs will be retained by the culturally appropriate tribe, with only the information necessary to guide remedial actions being detailed in the report.

These reports will be provided to all of the signatories for review. It is then incumbent on the reviewers to comment on the reports and proposed remedial actions within 30 days of receipt. If requested, meetings will be scheduled to discuss any of the proposed remedial actions and other options. If no concerns are voiced, or after resolution of differences, the remedial actions will occur as can be scheduled on upcoming trips, unless otherwise determined by the signatories.

Annual Reports

An annual report, based upon the fiscal year calendar, will be prepared by both GLCA and GRCA synthesizing the previous year's monitoring results and the effectiveness of remedial actions that have been implemented to date. It will also list the sites that will be monitored in the upcoming year, changes in methodology, if necessary, and remedial actions that are projected to be required in the upcoming year. At least one meeting of the signatories will occur to discuss the annual report between submission of the draft final report and completion of the final report. In fiscal year 1997, the draft annual report will be due on August 1, 1997. In subsequent years, the time frame for completion of the draft annual report will correspond with the contracting schedule developed by the GCMRC, with a 60-day review period between submission of the draft final report and completion of the final report. The NPS will take the lead in preparation of the report and coordination of meetings.

Although Reclamation is committed to cultural resources preservation in the river corridor, funding levels are planned several years in advance, and funds may not be available for large-scale remedial actions without considerable planning. Emergency funding must be taken from other programs that may also have pressing needs. Therefore, a section will be included in the annual report that projects remedial action funding needs for the next five years, so that these needs can be incorporated into Reclamation's funding cycle.

The annual report, once approved by all of the signatories, will be incorporated by the GCMRC into the annual report required by the GCPA. Recommendations for operational changes based on the data collected will be developed in consultation with the tribes, NPS, and Reclamation, and forwarded to the AMWG identified in the GCPA for incorporation into management recommendations on dam operations for the Secretary of the Interior. This yearly review will satisfy the consultation requirements under Section 106 of the NHPA and will satisfy agency responsibilities for tribal consultation under the Archeological Resources Protection Act.

Five-Year Synthetic Report

Every five years, a synthetic report will be produced which addresses management, methodology, theory, and education. In consultation with the PA signatories, the GCMRC will oversee the preparation and review of this report. The information utilized in the development of the report will draw on the monitoring and remedial actions implemented up to that point. All available management data will be synthesized and evaluated in terms of the long-term management goals discussed in Chapter V. All available research data will be synthesized and evaluated in terms of the research domains for the canyon discussed in Chapter VII.

Predictive Model

Concurrent with the completion of the Five-Year Synthetic Report, a refined predictive model for how and where erosion is likely to impact archeological sites will be developed. The model will draw upon earlier efforts by Hereford et al. (1993) and incorporate data collected through monitoring

efforts. It will also integrate study results from other research activities (i.e., sedimentation and climatological research). The objective of the predictive model, as noted in the above goals and purposes section, is to streamline monitoring efforts and identify and intervene in potential impacts before they occur.

Additional Cultural Resources

Documentation of any newly identified cultural resources will follow the standards employed during the original inventory of the corridor and any additional standards that may apply from previous sections of the HPP. Signatory notification of newly identified resources will follow the reporting protocols outlined above.

TRIBAL LONG-TERM MONITORING PROGRAMS

As noted in the above sections of this chapter, tribes may choose to participate in any or all aspects of monitoring or remedial actions that they desire and that they determine are culturally appropriate. This may include direct participation on NPS or tribal monitoring trips, or in remedial activities. In addition, tribes may establish specific monitoring programs oriented to their own particular cultural needs.

Standard Procedures

Currently, several of the participating tribes are developing long-term monitoring programs. Monitoring forms, methods for photographic documentation, and other aspects of the monitoring programs are being established. These programs must be integrated with the NPS/Reclamation archeological site monitoring program to ensure appropriate protection of cultural resources. Decisions such as frequency of monitoring and integration with data gathered from other programs will be included as part of each tribe's overall monitoring plan. Once that occurs and the plan is accepted by the PA signatories, the tribes will retain responsibility for monitoring the sites they have identified and for providing written reports to Reclamation on an annual basis. Additional monitoring needs of the tribes may be identified through yearly proposals submitted through the standard proposal process.

COMPLETION OF THE NATIONAL REGISTER OF HISTORIC PLACES NOMINATION

The nomination of cultural resources to the National Register is a topic that awaits further discussion by the PA signatories. Should the signatories decide that a nomination will be prepared, the GCMRC, in consultation with the signatories, will coordinate the preparation and review of the nomination.

CHAPTER IX

Long-Term Data Management

Reclamation and the NPS each have legal responsibilities for management of cultural resources in the river corridor. These responsibilities include long-term management of data resulting from monitoring and remedial actions, and with respect to the GCMRC, management and integration of data so as to facilitate use of various data bases by researchers. In addition, the tribes have the responsibility of maintaining monitoring data on TCPs important to them.

DATA MAINTAINED BY THE NATIONAL PARK SERVICE

Data collected by the NPS and relating to historic properties (archeological and TCPs) located within NPS units will be maintained within the NPS (GRCA/GLCA). Site location information and details concerning the nature of archeological sites is considered confidential and will be maintained as dictated by federal law.

Currently, data from river corridor monitoring and remedial activities conducted upstream of Lees Ferry are maintained by GLCA, while data collected downstream of Lees Ferry are maintained by GRCA. All archive data (i.e., original site documentation) will be archived in the NPS curatorial facility at GRCA or GLCA.

River corridor archeological monitoring data falls into four classes: (1) paper documents, (2) electronic (computerized) data, (3) visual media, and (4) artifact collections. Each class of data has its own archival requirements.

Paper documents include site, monitoring, surface analysis unit, and testing/excavation forms; ceramic and lithic analysis data sheets from the 1990-1991 inventory; photographic records; maps (topographic quadrangle maps with plotted archeological site locations, original hand-drafted site maps from the survey, and total station site maps); and correspondence, reports, manuals, computer documentation, and publications in the project files and library. Paper documents have the greatest volume of all classes of data. Most original field documents will be archived for historic reasons. The computerized data, rather than the original forms, will be made accessible to researchers. Copies of all reports will be available at GRCA, GLCA, Reclamation's Upper Colorado Regional Office, and the GCMRC.

Electronic (computerized) data include archeological site, monitoring, photographic, mapping, reporting, and GIS data bases. Because this information is stored electronically, it takes up very little space. Project data are currently accessed using WordPerfect (word processing), dBASE and Paradox (data base), Systat (statistical analysis), PhotoStyler (image editing), and ArcView (GIS) software.

There is a recognition that as computer software changes, upgrades to the data base programs will be made. Site location information in the GIS data base is restricted. In addition, site location data will be removed from the computerized records prior to transfer to the GCMRC or outside requestors.

Visual media include photographs, photocards, negatives, duplicate prints, color slides, historic photographs, aerial photographs with plotted site locations, mylar overlays, and videotape. Visual media are second in terms of the amount of space required for storage. There are currently over 6,500 photographs in the river corridor monitoring project collections. The aerial photographs and mylar overlays will be kept confidential, since they show site locations.

Artifact collections such as ceramics, lithics, and perishables are curated at the GRCA curatorial facility on the south rim. The majority of these artifacts were recovered during the survey and amount to only a few boxes of material. Artifacts are archived according to NPS museum collection procedures outlined in NPS-28 Cultural Resource Management Guidelines, Management of Museum Objects, and the Museum Handbook, Part II.

Original field forms are stored in fire-proof file cabinets at GRCA and in the GLCA curation facility. Electronic data are stored on magnetic tape, with backup copies kept in fire-proof safes at GRCA and GLCA, and off site. Photographic archival methods differ slightly between the two NPS units, but the negatives are protected from fire. At GRCA, negatives are housed in acid-free envelopes and polypropylene negative sleeves, kept in acid-free, archival-quality binders, and protected from light, dust, and extreme temperatures. AT GLCA, negatives are housed in protective sleeves, kept in three-ring binders, and stored in GLCA's environmentally protected curation facility.

Data security is a primary concern of all PA signatories. Culturally sensitive data includes site forms and computerized data bases with locational information, and topographic quadrangle maps, aerial photographs, and mylar overlays with plotted site locations. Culturally sensitive information will not be released to unauthorized individuals. Federal law (NHPA and Archeological Resources Protection Act) requires agencies to maintain confidentiality related to archeological site location and information that could result in loss or damage to the sites. Therefore, access to site location information, Universal Transverse Mercator coordinates, global position system coordinates, and river mile and bank locations is restricted. Information regarding the nature or contents of a particular archeological site will be kept confidential. The NPS and GCMRC will work cooperatively to develop protocols for sharing of data related to this program where appropriate.

DATA MAINTAINED BY THE TRIBES

Data maintained by the individual tribes is related to the variety of research efforts each tribe is involved with. As such, the manner in which data is maintained will vary. Protocols will be developed in association with the GCMRC which oversees these efforts.

DATA MAINTAINED BY THE GRAND CANYON MONITORING AND RESEARCH CENTER

Based on developed protocols, data associated with GCMRC-funded projects and activities will be maintained at the GCMRC or another specified location. Examples of data to be maintained include field data, draft, and final reports. Generally, access to data will be through visual inspections of reports, documents, and archives, and through electronic mechanisms. Data collections will include non-cultural information as well as cultural data. Sensitive cultural data will be protected, and procedures and protocols will be developed with the PA signatories to determine the appropriate mechanisms for handling, reviewing, and reporting sensitive data.

DATA MANAGEMENT RESEARCH

As the amount of data increases, the need to efficiently manage it becomes increasingly important. Simple storage is not useful unless the data can be accessed and applied to management and scientific uses. Approaches to data management that allow ease of use as well as flexibility in analytic capability should be explored. Currently, GISs will address some of these needs. As there are existing GISs at the NPS and at the GCMRC (which has assumed management of the GCES GIS), coordination and integration of data is an important management and research objective.

Along with the need for ready access to data is the need to keep some cultural resources information confidential. This necessitates a balancing act between public and private information needs. This may be an area for innovative approaches to data management in the future.

CHAPTER X

Public Outreach and Education

The Glen Canyon Dam Operations Cultural Resources Program has been, and continues to be, a unique and successful program of cooperation and information sharing. Much of the data that has been collected as part of this program is new and has been obtained using innovative and state-of-the-art techniques. As a result, much of our understanding of the cultural occupation and use of the Grand Canyon has significantly changed and grown. It is critical to disseminate as much of this information as possible to the public so that they can learn about the unique cultural and historic value of this resource, and, perhaps more importantly, become sensitized to the preservation and protection of this valuable heritage.

The best way to instill a stewardship ethic in the public is to educate them about the cultural resources in the canyon and why it is so important to treat them with respect. Much of the public is currently unaware of the deep spiritual value which the canyon has for Native American tribes. While they may be vaguely aware of some of the better known archeological sites in the area, most of the public is unaware of the traditional values that many of the cultural and natural resources (and of the canyon itself) hold for tribes. Unfortunately, "traditional cultural property" is a term that is currently unknown to the vast majority of the public. Thus, all entities involved in the Glen Canyon Dam Operations Cultural Resources Program have an excellent opportunity to teach the public about aspects of our history that should be treated with sensitivity and a sense of stewardship.

CURRENT PUBLIC OUTREACH EFFORTS

While public outreach and education are not specifically mentioned in the PA, all signatories agree that dissemination of information regarding the Glen Canyon Dam Operations Cultural Resources Program is very important. Efforts have already been made to provide information to the professional community and general public, yet additional efforts are still needed. The current public outreach efforts are discussed below:

Professional Community

- A 1996 Society for American Archeology symposium entitled *Below the Dam: Cultural Resources and the Colorado River below Glen Canyon Dam* is available on tape from the Society for American Archeology.

- Papers in the 1997 George Wright Society symposium entitled *Below the Dam: An Experiment is Partnerships for Management of Cultural Resources at the Colorado River below Glen Canyon Dam* will be published in the George Wright Society proceedings.

- A cultural resources report on the 1996 experimental beach/habitat-building test flow will be printed and distributed by Reclamation.

Existing Education Programs

- The NPS river guide education program consists of yearly trips to train and inform professional river guides. The river guides have a very broad range of influence over the information disseminated to the sector of the public that takes commercial river trips.

- The GLCA interpreters present information to the general public about archeology in the GLCA section of the river corridor.

- A stabilization workshop was presented cooperatively by the NPS and Reclamation in May of 1995, with broad participation by the tribes. The workshop covered the geomorphology of the river corridor, river corridor erosion information, and information about a range of stabilization measures that might be relevant to cultural resources within the river corridor.

Tribal Education Programs

Recent presentations of the Southern Paiute Glen Canyon Program to the professional community are as follows:

- 1995 Society for American Archeology conference paper (*Rock Art in the Grand Canyon* by Lawrence Loendorf).

- 1996 Society for Applied Anthropology conference session (Southern Paiutes and the Glen Canyon Dam EIS) included papers by Diane Austin, Angelita Bulletts, Cynthia Osife, Brian Fulfrost, and Richard W. Stoffle.

- 1996 National Association of Environmental Professionals conference paper (proceedings published) entitled *Placing Dam Management on a Solid Foundation: Southern Paiutes and the Bureau of Reclamation* by Diane Austin and Angelita Bulletts.

- 1997 International Association of Impact Assessment conference paper entitled *Identifying and Protecting Southern Paiute Cultural Resources in the Colorado River Corridor Below Glen Canyon Dam* by Diane Austin and Cynthia Osife.

- Two additional papers are currently being published: (1) *Houses of Power* by Lawrence Loendorf and Angelita Bulletts, in a forthcoming book published by the University of New Mexico Press, and (2) *Cultural Landscapes and Traditional Cultural Properties: A Southern Paiute View of the Grand Canyon and Colorado River* by Richard W. Stoffle, David Halmo, and Diane Austin in the spring 1997 edition of *American Indian Quarterly*.

The Southern Paiute Consortium will continue to be responsible for public education and outreach regarding Southern Paiute ties to the Colorado River corridor and the cultural resources found there. Southern Paiute existing education programs include:

- Tribal monitors training program.
- Southern Paiute youth environmental education program.
- Development of a multi-media CD-ROM module regarding Southern Paiutes in the Colorado River corridor will be made available to the public through the Kaibab Cultural Center and the participating tribes in the Southern Paiute Consortium by the summer 1997.

[Information about presentations and existing education programs of other participating tribes will be incorporated as received.]

FUTURE PUBLIC OUTREACH EFFORTS

Advice from the Arizona State Historic Preservation Office

Reclamation and the NPS have produced numerous reports detailing what has been accomplished, and is still being accomplished, as part of the overall program. These agencies, in close consultation with the affected tribes, could take these reports and distill them into public reports or "popular" versions of the technical reports. These public monographs need not be lengthy and should focus on presenting a general cultural history of the canyon from all perspectives (i.e., archeological, tribal, and historical/archival) and the environmental studies component of the research. These interpretive reports should also include many of the photographs, both historic and recent, that portray the cultural, environmental, and possibly tribal (if appropriate) aspects of the Grand Canyon. Given that much of the tribal information regarding the history and use of the canyon is sensitive, the tribes would need to be actively involved in the production of such public, interpretive reports. Such reports would give the tribes the opportunity to get their messages of concern out to a broad portion of the population.

With regard to future public outreach efforts, the GCMRC should strive to produce interpretive videos, displays, mobile exhibits, schoolroom presentations, slide show programs, evening lecture series, etc., on all aspects of the canyon that are not considered to be sensitive information to the tribes. All of the above mediums are excellent tools for educating and sensitizing the public about the special cultural heritage of the Grand Canyon. Without the support and understanding of the public, the constituency that we need to help continue to protect and preserve this important cultural and natural resource (on both local and national levels) will be lacking.

Grand Canyon Monitoring and Research Center Education Program

Education and public outreach are addressed in the GCMRC's Cultural Resources Program. These efforts include the development of educational opportunities for Native American students, particularly the participating tribal groups. Examples of these opportunities include the development of cooperative education agreements among the GCMRC, universities and agencies, and tribes to involve students in intern programs that are related to the resources subject to monitoring and research activities undertaken by the GCMRC.

The GCMRC will work with Native American groups to develop appropriate mechanisms for the protection of sensitive information, and provide public outreach such as publications in varying formats for information dissemination to tribal members, student outreach field trips and visits, and workshops developed by the GCMRC and Native American hosts. These activities will present differing perspectives on canyon resources and the GCMRC's activities.

CHAPTER XI

Evaluation of the Historic Preservation Plan

The HPP will need to be periodically reviewed and adjusted in order to meet the needs of the PA signatories, as well as to continue to protect cultural resources in an effective manner. In addition, the HPP review process is a way of evaluating whether or not we are accomplishing what we set out to accomplish, and if our management goals have changed through time. Modifications to the program will undoubtedly occur, and the HPP reflects an adaptive process which will change as additional information is collected. Changes to procedures and priorities based upon incorporation of new data and ongoing consultations will continue to result in a more focussed and useful program.

After the HPP has been reviewed and accepted by all signatories in fiscal year 1997, an HPP review will take place every five years on a calendar basis. The first review period will therefore take place in January of 2002. Reclamation will provide the PA signatories with a notice of the review period during which comments on the HPP may be submitted. At the end of the review period, Reclamation and the NPS will meet with the signatories to discuss the comments received.

In the event that changes considered substantial by the signatories are required, Reclamation and the NPS will cooperate to provide signatories with a schedule for completing the changes and reviewing the new document. The new document will be completed and ready to circulate for review within six months of the date of the HPP review meeting. The revised document will be in place within one year of the HPP review meeting.

Should emergency situations not covered by the HPP occur sooner than the five-year review period, the NPS and Reclamation will consult with the PA signatories to arrive at an appropriate course of action. The Dispute Resolution section of the PA outlines the means for resolving disputes that may arise in the course of operation of the Cultural Resources Program.

List of Preparers

Name	Affiliation
Nancy Andrews	Northern Arizona University
Roger Anyon	Zuni Pueblo
Janet Balsom	Grand Canyon National Park
Mary Barger	Western Area Power Administration
Angelita Bullets	Southern Paiute Consortium
Tim Burchett	Glen Canyon National Recreation Area
Chris Coder	Grand Canyon National Park
Christian Downum	Northern Arizona University
David Garrett	Grand Canyon Monitoring and Research Center
Warren Hurley	Bureau of Reclamation Western Colorado Area Office Southern Division
Loretta Jackson	Hualapai Tribe
Jayne Kelleher	Bureau of Reclamation Upper Colorado Regional Office
Ruth Lambert	Grand Canyon Monitoring and Research Center
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Lisa Leap	Grand Canyon National Park
Roland Manakaja	Havasupai Tribe
Cynthia Osife	Southern Paiute Consortium
Michael Yeatts	Hopi Tribe

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Appendixes

Appendix A

Programmatic Agreement on Cultural Resources

PROGRAMMATIC AGREEMENT
AMONG
THE BUREAU OF RECLAMATION, THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, THE NATIONAL PARK SERVICE,
THE ARIZONA STATE HISTORIC PRESERVATION OFFICER, HAVASUPAI TRIBE, HOPI TRIBE, HUALAPAI TRIBE, KAIBAB PAIUTE TRIBE, NAVAJO NATION, SAN JUAN SOUTHERN PAIUTE TRIBE, SHIVWITS PAIUTE TRIBE AND ZUNI PUEBLO
REGARDING
OPERATIONS OF THE GLEN CANYON DAM

WHEREAS, the Secretary of Interior has directed the preparation of an Environmental Impact Statement (EIS) on the effects of the operation of the Glen Canyon Dam on the downstream environmental and ecological resources, and historic properties of Glen Canyon and Grand Canyon; and

WHEREAS, the Grand Canyon Protection Act of 1992 (P.L. 102-575 Title XVIII) mandates the continued monitoring and management of resources located within the area of impact covered by this agreement and requires completion of the EIS by October 1994; and

WHEREAS, the purpose of the EIS is to ". . . reevaluate the operation of the Glen Canyon Dam to determine specific options that could be implemented to minimize—consistent with law—adverse impacts on the downstream environmental and cultural resources and Native American interests in Glen and Grand Canyons." (Interim Preliminary Draft EIS 7/92); and

WHEREAS, the Bureau of Reclamation (Reclamation), Upper Colorado Region, administers the releases of water from the Glen Canyon Dam and has determined that the operation of the Dam (the Program) may have effects upon properties included in or eligible for inclusion in the National Register of Historic Places and has consulted with the Advisory Council on Historic Preservation (Council), the National Park Service (NPS), and the Arizona State Historic Preservation Officer (SHPO) pursuant to 36 CFR § 800.13 of the regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act (ACT) (16 U.S.C. 470f); and

WHEREAS, Reclamation is the lead Federal agency for the Program for purposes of Section 106; and

WHEREAS, the NPS is responsible for the administration and management of historic properties within the boundaries of the Glen Canyon National Recreation Area and the Grand Canyon National Park pursuant to Section 110 of the Act; and

WHEREAS, given their mutual responsibilities, Reclamation and the NPS have determined to coordinate their respective roles in the management and consideration of historic properties which may be affected by the Program; and

WHEREAS, the Hualapai Tribe is responsible for the administration and management of historic properties within the boundaries of its reservation lands affected by the Program; and WHEREAS, prior to performing any work required under the terms of this agreement within the boundaries of the Hualapai Indian Reservation, Reclamation or the NPS shall notify the Hualapai Tribe of such work and obtain appropriate Tribal permits before entering the boundaries of the Hualapai Indian Reservation. The Tribe will require that a Hualapai Tribe member monitor be present when necessary for any culturally sensitive work, as determined by the Tribe.

WHEREAS, the Navajo Nation is responsible for the administration and management of historic properties within the boundaries of the Navajo Nation pursuant to the Cultural Resources Protection Act (CMY-19-88); and

WHEREAS, the Navajo Nation agrees to NPS administration and management of any Navajo Nation historic properties which may be included under the terms of this agreement until such time as the Navajo Nation assumes such responsibility; and

WHEREAS, the Havasupai Tribe, Hopi Tribe, Hualapai Tribe, Kaibab Paiute Tribe, Navajo Nation, San Juan Southern Paiute Tribe, Shivwits Paiute Tribe and the Zuni Pueblo (the Tribes) participated in consultation and are signatories to this Programmatic Agreement;

NOW, THEREFORE, Reclamation, the Council, NPS, SHPO, and the Tribes agree that the Program shall be administered in accordance with the following stipulations to satisfy Reclamation's Section 106 responsibilities for all individual aspects of the Program.

Stipulations

Reclamation, as lead Federal agency for purposes of the Program, shall ensure that the following stipulations are carried out.

1. IDENTIFICATION AND EVALUATION

a. The NPS has identified a total of 313 contributing properties, referred to as the Grand Canyon River Corridor District (District), within the area of potential affects (APE). Nine additional properties within the boundaries of the District remain unevaluated. The NPS shall assist Reclamation in obtaining the necessary information to complete the evaluation of these nine sites for determining their eligibility for listing on the National Register as contributing properties to the District or as eligible on their own merits. Reclamation shall submit such evaluations to the SHPO for determinations of eligibility. In the event that Reclamation and the SHPO do not agree on the eligibility of any property, or if the Council or Keeper so request, Reclamation shall obtain a formal

determination of eligibility from the Keeper of the National Register in accordance with 36 CFR § 800.4(c). Determinations of eligibility for the remaining nine properties shall be completed by August 1993.

b. Reclamation and the NPS, in consultation with the SHPO, shall identify and evaluate historic properties in the remaining 37 miles of the APE not previously intensively inventoried (Attachment A). Properties identified within the 37-mile corridor shall be evaluated on their own merits and as contributing elements to the District pursuant to 36 CFR § 800.4(c). An intensive inventory of the entire APE shall be completed by August 1993. Ongoing identification and evaluation efforts shall be a part of the management program identified at Stipulations 2 and 3.

c. In consultation with the Tribes and SHPO, Reclamation and the NPS shall identify and evaluate properties within the APE which retain traditional cultural values. Such properties shall be evaluated under criteria A, B, C, and D of the National Register Criteria pursuant to 36 CFR Part 60, and taking into consideration "National Register Bulletin 38, Guidelines for Evaluating and Documenting Traditional Cultural Properties."

(1) Traditional cultural properties shall be identified by Reclamation and the NPS through the conduct of ethnographic studies. Ethnographic studies shall solicit and include the participation of and consultation with the Tribes to collaborate in the identification and evaluation of traditional cultural properties.

(2) Reclamation shall submit such evaluations to the SHPO for determinations of eligibility. In the event that Reclamation and the SHPO do not agree on the eligibility of any property, or if the Council or Keeper so request, Reclamation shall obtain a formal determination of eligibility from the Keeper of the National Register in accordance with 36 CFR § 800.4(c). Such study and evaluations shall be completed by October 1994.

2. MONITORING AND REMEDIAL ACTION

a. Within three months of the execution of this Programmatic Agreement, Reclamation and the NPS, in consultation with the SHPO and Tribes, shall develop a Plan for monitoring the effects of the Glen Canyon Dam operations on historic properties within the APE and for carrying out remedial actions to address the effects of ongoing damage to historic properties. The purpose of the Monitoring and Remedial Action Plan shall be to generate data regarding the effects of Dam operations on historic properties, identify ongoing impacts to historic properties within the APE; and develop and implement remedial measures for treating historic properties subject to damage. Such data shall be incorporated into Reclamation's Long-Term Operating and Monitoring Plans governing dam releases identified in the EIS. The EIS is scheduled for completion in October 1994.

b. The Monitoring and Remedial action Plan (Plan) shall provide for the identification and evaluation of previously unrecorded properties overlooked by previous surveys or exposed subsequent to the surveys, and include measures by which any adverse effects identified during the monitoring effort shall be avoided or minimized. Remedial measures shall be implemented to mitigate ongoing

adverse effects and may include, but not be limited to, bank stabilization, check dam construction, and data recovery, as appropriate. The Plan shall specify an expedited consultation process among the parties to this agreement to accommodate situations requiring remedial actions.

c. Reclamation shall submit a draft of the Plan to the parties in this agreement for review and comment. Each party shall have 60 days from receipt of the Plan to comment. Reclamation may assume the concurrence of any party which does not issue comments within 60 days of their receipt of the Plan.

(1) Reclamation shall take into consideration all comments received in their development of a final draft Plan, and submit the final draft Plan to the reviewing parties for a second review opportunity. Each reviewing party shall have 20 days from receipt to review the final draft Plan and issue comments to Reclamation.

(2) If any reviewing party objects to the adequacy of the final draft Plan, Reclamation shall consult with the objecting party, and the other parties to this Programmatic Agreement as necessary to resolve the objection pursuant to Stipulation.

(3) When all objections are resolved, Reclamation shall implement the Monitoring and Remedial Action Plan.

3. MANAGEMENT

a. Reclamation and the NPS shall incorporate the results of the identification, evaluation, and monitoring and remedial action efforts into a Historic Preservation Plan (HPP) for the long-term management of the Grand Canyon River Corridor District and any other historic properties within the APE. The HPP shall be developed in consultation with the parties to this Programmatic Agreement. The HPP shall integrate Reclamation's lead agency role pursuant to Section 106 of the Act and the NPS's stewardship role pursuant to Section 110 of the Act. Specifically, the HPP shall provide management direction responsive to the NPS's responsibilities under Sections 110(a)(1) and 110(a)(2); and NPS's and Reclamation's responsibilities under Sections 110(b) and 110(d).

b. The HPP shall establish consultation and coordination procedures, long-term monitoring and mitigation strategies, management mechanisms and goals for long-term management of historic properties within the APE.

c. Reclamation and the NPS shall submit a draft of the HPP to the parties to this agreement for 60 days review. The parties to this agreement shall have 60 days from receipt to issue comments to Reclamation and the NPS regarding the adequacy of the HPP. Reclamation and the NPS may assume the concurrence of any party which does not issue comments within 60 days of receipt of the HPP.

(1) Reclamation and the NPS shall take into consideration all comments received in their development of a final draft HPP, and submit the final draft HPP to the reviewing parties for a second review opportunity. Each reviewing party shall have 30 days from receipt to review the final draft HPP and issue comments to Reclamation and the NPS.

(2) If any reviewing party objects to the adequacy of the final draft HPP, Reclamation and the NPS shall consult with the objecting party, and the other parties to this agreement as necessary to resolve the objection pursuant to Stipulation 4. When all objections have been resolved, Reclamation and the NPS shall implement the HPP.

d. The development and review of the HPP shall be completed prior to the issuance of a Record of Decision for the GCD-EIS, or December 1994, whichever comes first. Upon issuance of a Record of Decision, the HPP shall be reviewed by the parties to this agreement and revised, if necessary, based on the decision. The review of a revised HPP shall be conducted in accordance with the procedures of Stipulation 3.C.1. and 2.

4. DISPUTE RESOLUTION

a. Should any party to this agreement object within 30 days to any plans, specifications, or actions proposed pursuant to this agreement, Reclamation and the NPS shall consult with the objecting party to resolve the objection. If any party involved in the dispute determines that the dispute cannot be resolved, Reclamation shall forward all documentation relevant to the dispute to the Council. Within 30 days after receipt of all pertinent documentation, the Council will either:

(1) Provide Reclamation and the NPS with recommendations, which Reclamation will take into account in reaching a final decision regarding the dispute; or

(2) Notify Reclamation and the NPS that it will comment pursuant to 36 CFR § 800.6(c)(2) with reference to the subject of the dispute.

Any recommendation or comment provided by the Council will be understood to pertain only to the subject of the dispute; Reclamation's responsibility to carry out all actions under this agreement that are not the subjects of the dispute shall remain unchanged.

b. At any time during implementation of the measures stipulated in this agreement should an objection to any such measure or its manner of implementation be raised by a member of the public, Reclamation and the NPS shall take the objection into account and consult as needed with the objecting party, SHPO, the Tribes, or the Council to resolve the objection.

5. REVIEW OF THE AGREEMENT

a. The Council, SHPO, NPS and Tribes may review activities carried out pursuant to this Programmatic Agreement, and the Council will review such activities if so requested. Reclamation will cooperate with the Council, SHPO, NPS and Tribes in carrying out their reviewing activities.

b. Reclamation and the NPS shall cooperatively provide biannual summary reports of their progress toward completing the terms of this agreement to each of the parties to this agreement. The biannual reports shall identify accomplishments and actions completed and provide schedules of completion for all remaining tasks. The first biannual report shall be submitted to the parties of this agreement six (6) months after the date of the Council's signature on this agreement and every six months thereafter until the HPP has been implemented.

c. A yearly meeting will be held among the signatories to review the agreement and the results of the monitoring and remedial actions.

6. AMENDMENT

Any party to this Programmatic Agreement may request that it be amended, whereupon the parties will consult in accordance with 36 CFR § 800.13 to consider such amendment.

7. TERMINATION

Any party to this Programmatic Agreement may terminate this agreement by providing 30 days written notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. In the event of termination, Reclamation will comply with 36 CFR § § 800.4 through 800.6 with regard to individual undertakings covered by this Programmatic Agreement.

8. FAILURE TO CARRY OUT TERMS

In the event Reclamation and the NPS do not carry out the terms of this Programmatic Agreement, Reclamation will comply with 36 CFR § § 800.4 through 800.6 with regard to individual undertakings covered by this Programmatic Agreement.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

BY: Robert D. Bush Date: 2/8/94

Title: Executive Director

BUREAU OF RECLAMATION

BY: Robert Peterson Date: 8/2/93

Title: Regional Director

ARIZONA STATE HISTORIC PRESERVATION OFFICER

BY: James W. Garrison Date: 8/17/93

Title: State Historic Preservation Officer

NATIONAL PARK SERVICE, WESTERN REGION

BY: Stanley T. Albright DATE: 11/23/93

Title: Regional Director, Western Region

NATIONAL PARK SERVICE, ROCKY MOUNTAIN REGION

BY: R. Cam Collier for DATE: DEC 7 1993

Title: Robert M. Baker, Regional Director, RMR

HAVASUPAI TRIBE

BY: _____ Date: _____

Title: _____

HOPI TRIBE

BY: James Duckett Date: 8-30-94

Title: Chairman

HUALAPAI TRIBE

BY: Robert Havatone Date: 02-15-94

Title: Chairman, Hualapai Tribal Council

KAIBAB PAIUTE TRIBE

BY: Gloria Bowen Benson Date: 4/12/94

Title: Tribal Chairperson

NAVAJO NATION

BY: [signature] Date: 1/3/94

Title: Historic Preservation Officer

SAN JUAN SOUTHERN PAIUTE TRIBE

BY: _____ Date: _____

Title: _____

PAIUTE INDIAN TRIBE OF UTAH FOR:
SHIVWITS PAIUTE TRIBE

BY: Alfred Shepherd Date: April 20, 1994

Title: Tribal Chairman

ZUNI PUEBLO

BY: Robert E Lewis Date: 7-6-93

Title: Governor, Pueblo of Zuni

Appendix B

Standard Report Format for Annual Reports

I. Abstract

II. Fiscal Year Scope of Work

- A. Site Selection
- B. Field and Lab Methods
- C. Total Station Mapping
- D. Surface Analysis Units
- E. Stationary Camera

III. Impacts to Cultural Resources

- A. Physical Impacts
- B. Visitor-Related Impacts
- C. Summary of Impacts
- D. Geomorphic Research
- E. Photographic Documentation

IV. Site Specific Results and Recommendations

V. Management Summary

- A. Measures to Reduce Site Impact
- B. Measures to Protect Site Integrity
- C. Fiscal Year Monitoring Work Plan
- D. Monitoring Program Assessment

  Remedial Actions Implemented

  Summary and Conclusions

VI. Bibliography

VII. Appendixes

- A. Sample Monitor Form
- B. Work Plan for Next Fiscal Year

Appendix C

Standard Request for Tribal Proposals

Scope of Work — Tribal Cultural Resources Monitoring and Participation in Cultural Resources Programmatic Agreement Administration — Glen Canyon Dam Operations

Important: This information will be provided by the Grand Canyon Monitoring and Research Center when it is developed. Until that time, the Bureau of Reclamation's standard request for proposals is included in this appendix.

1. Title of Proposal

2. Name and Title of Preparer

3. Source of Proposal

4. Objectives of Proposal

Proposal should address all aspects of tribal participation in the cultural resources program as delineated in the Programmatic Agreement. Proposal should also include any hypotheses being tested.

5. Contents of Proposal

a. List of sites and site locations (to the extent confidentiality allows) to be monitored during the yearly trip and justification for monitoring those sites. Sites should include traditional cultural properties, traditional resources, and/or archeological sites which have ancestral or other cultural relation to the tribe to be monitored.

b. Description of monitoring techniques and content of monitoring data base to be collected (to the extent confidentiality allows).

c. Description of extent of tribal participation in Programmatic Agreement signatory meetings, review of external reports, and participation in internal meetings.

d. Description of how tribal data base on traditional cultural properties and monitoring results will be maintained, including information on maintenance in the Geographic Information System and information on maintenance of archives.

e. Budget, to include personnel costs, administrative and support costs, travel, and consultant fees.

6. Deliverables

a. Annual Monitoring Report. Prepare a report which includes all the data categories in Appendix C, the standard format outlined in the Historic Preservation Plan (for examples see fiscal year 1994 annual reports from Glen Canyon National Recreation Area and Grand Canyon National Park).

Report will include results of the tribal monitoring trip, to the extent confidentiality allows, and summary and management recommendations from the tribal monitoring trip as well as from tribal participation in any National Park Service trips during the past year. Areas of overlapping interest among affiliated groups will be identified in the report.

Also include a brief statement of the objectives, major accomplishments, problems encountered, fiscal status, prioritized recommendations for actions required of Reclamation or the National Park Service in the coming year, synopsis of a work plan for the coming year, and an inventory of property acquired during the reporting period.

Areas of concern with other National Park Service/Reclamation activities outside the cultural resources program should be described. If a test flow has been conducted during the past year, any impacts observed during monitoring should be reported.

b. Due Date. The annual monitoring report will be due on August 1 of each year. Six copies of the report will be submitted to Reclamation's Upper Colorado Regional Office and two copies will be submitted to the Grand Canyon Monitoring and Research Center.

Appendix D

Archeological Site Data for the Historic Preservation Plan

The total number of sites in the monitoring program was derived by taking the 325 sites Grand Canyon National Park has visited to date (325), subtracting the sites that were discontinued from the program (37), and adding in the Glen Canyon National Recreation Area sites that Tim Burchett monitors (45). Therefore, 325 minus 37, plus 45, equals 333. Note that we still have another three sites to visit in April which have not been seen since the survey, and will be included or excluded from the program after field evaluation.

There were 25 site type categories used during the survey. These site types have been collapsed into the five categories shown below:

Artifact Scatters.—Sherd scatters, lithic scatters, artifact scatters, and historic trash scatters.

Rock Art.—Rock art and inscriptions.

Thermal/Fire Features.—Roaster complex and isolated thermal feature.

Structures.—Pueblo, small structure, ephemeral structure, storage site, camp, historic structure, delta complex, and water/soil control feature.

Other.—Enigmatic features, isolated pot caches, other tool caches, isolated ground stone, bedrock mortars, and trails.

Cultural affiliation in the following table was derived from the cultural affiliation of the primary component at each site only. Other cultural components are not included here. The 18 original cultural affiliation categories used during the survey were collapsed into 11 categories. Included in the Puebloan category are sites categorized as Anasazi, Western Kayenta Anasazi, and Virgin Anasazi during the survey. The historic category includes both the Euro-American historic and historic unknown categories. The unknown category includes the original unknown, other, aceramic unknown, and ceramic unknown categories.

Table 1.—Sites in the Monitoring Program by Reach
(N = 333 Sites)

Reach	*Site Number*	*Site Type*	*Cultural Affiliation*
0	C:02:011	Structures	Historic
0	C:02:013	Structures	Puebloan
0	C:02:032	Other	Unknown

Reach	*Site Number*	*Site Type*	*Cultural Affiliation*
0	C:02:035	Structures	Puebloan
0	C:02:036	Artifact Scatters	Unknown
0	C:02:037	Rock Art	Unknown
0	C:02:038	Rock Art	Archaic
0	C:02:039	Artifact Scatters	Unknown
0	C:02:040	Artifact Scatters	Unknown
0	C:02:041	Structures	Puebloan
0	C:02:048	Other	Historic
0	C:02:056	Rock Art	Navajo
0	C:02:057	Structures	Historic
0	C:02:058	Other	Unknown
0	C:02:060	Other	Puebloan
0	C:02:071	Artifact Scatters	Puebloan
0	C:02:072	Structures	Puebloan
0	C:02:073	Rock Art	Puebloan
0	C:02:074	Artifact Scatters	Unknown
0	C:02:075	Structures	Unknown
0	C:02:076	Structures	Unknown
0	C:02:077	Artifact Scatters	Unknown
0	C:02:078	Artifact Scatters	Unknown
0	C:02:079	Structures	Puebloan
0	C:02:080	Artifact Scatters	Puebloan
0	C:02:081	Artifact Scatters	Puebloan
0	C:02:082	Structures	Puebloan
0	C:02:084	Structures	Puebloan
0	C:02:086	Structures	Puebloan

Reach	*Site Number*	*Site Type*	*Cultural Affiliation*
0	C:02:087	Artifact Scatters	Historic
0	C:02:088	Structures	Puebloan
0	C:02:090	Structures	Puebloan
0	C:02:091	Structures	Puebloan
0	C:02:099	Structures	Puebloan
0	C:02:100	Structures	Puebloan
0	C:02:102	Rock Art	Historic
0	C:02:103	Rock Art	Historic
0	C:02:104	Rock Art	Unknown
0	C:02:105	Rock Art	Historic
0	C:02:106	Structures	Unknown
0	C:02:108	Rock Art	Unknown
0	C:03:003	Other	Historic
0	C:03:004	Rock Art	Archaic
0	C:03:006	Rock Art	Archaic
0	C:03:010	Structures	Unknown
1	C:02:085	Thermal/Fire Features	Unknown
1	C:02:089	Structures	Unknown
1	C:02:092	Structures	Unknown
1	C:02:094	Other	Historic
1	C:02:096	Structures	Unknown
1	C:02:097	Structures	Puebloan
1	C:02:098	Structures	Unknown
1	C:02:101	Thermal/Fire Features	Unknown
1	C:06:003	Structures	Puebloan
1	C:06:006	Artifact Scatters	Puebloan

Reach	*Site Number*	*Site Type*	*Cultural Affiliation*
2	C:06:002	Rock Art	Historic
2	C:06:004	Rock Art	Historic
2	C:06:005	Rock Art	Unknown
2	C:06:008	Structures	Unknown
2	C:06:010	Structures	Unknown
3	C:05:004	Other	Historic
3	C:05:007	Rock Art	Historic
3	C:05:009	Structures	Formative
3	C:05:031	Structures	Puebloan
3	C:05:035	Structures	Unknown
3	C:05:037	Structures	Puebloan
3	C:05:039	Other	Puebloan
3	C:09:005	Structures	Puebloan
3	C:09:065	Other	Historic
4	C:09:030	Burials	Historic
4	C:09:031	Burials	Historic
4	C:09:032	Structures	Puebloan
4	C:09:034	Artifact Scatters	Historic
4	C:09:050	Other	Formative
4	C:09:051	Structures	Puebloan
4	C:09:052	Structures	Puebloan
4	C:09:053	Structures	Puebloan
4	C:09:056	Structures	Archaic
4	C:09:061	Structures	Puebloan
4	C:09:062	Other	Puebloan
4	C:09:067	Structures	Puebloan

Reach	*Site Number*	*Site Type*	*Cultural Affiliation*
4	C:09:068	Structures	Puebloan
4	C:09:069	Thermal/Fire Features	Puebloan
4	C:09:072	Structures	Puebloan
4	C:09:080	Structures	Puebloan
4	C:09:082	Structures	Puebloan
4	C:09:083	Structures	Historic
4	C:09:084	Artifact Scatters	Puebloan
4	C:09:088	Other	Historic
4	C:13:006	Structures	Puebloan
4	C:13:329	Other	Puebloan
4	C:13:353	Structures	Puebloan
4	C:13:365	Structures	Unknown
4	C:13:367	Structures	Unknown
4	C:13:368	Artifact Scatters	Archaic
4	C:13:370	Structures	Puebloan
4	C:13:372	Structures	Unknown
5	C:13:005	Thermal/Fire Features	Puebloan
5	C:13:007	Structures	Puebloan
5	C:13:008	Structures	Puebloan
5	C:13:009	Structures	Puebloan
5	C:13:010	Structures	Cohonina
5	C:13:033	Structures	Puebloan
5	C:13:069	Structures	Puebloan
5	C:13:070	Structures	Puebloan
5	C:13:092	Structures	Puebloan
5	C:13:098	Structures	Historic

Reach	*Site Number*	*Site Type*	*Cultural Affiliation*
5	C:13:099	Structures	Puebloan
5	C:13:100	Structures	Puebloan
5	C:13:101	Structures	Formative
5	C:13:131	Structures	Historic
5	C:13:272	Structures	Puebloan
5	C:13:273	Thermal/Fire Features	Formative
5	C:13:274	Structures	Unknown
5	C:13:291	Structures	Puebloan
5	C:13:321	Thermal/Fire Features	Unknown
5	C:13:322	Rock Art	Puebloan
5	C:13:323	Structures	Archaic
5	C:13:325	Structures	Formative
5	C:13:326	Structures	Unknown
5	C:13:327	Structures	Archaic
5	C:13:333	Structures	Puebloan
5	C:13:334	Structures	Cohonina
5	C:13:335	Thermal/Fire Features	Unknown
5	C:13:336	Structures	Puebloan
5	C:13:337	Thermal/Fire Features	Unknown
5	C:13:338	Thermal/Fire Features	Unknown
5	C:13:339	Structures	Puebloan
5	C:13:340	Structures	Puebloan
5	C:13:342	Structures	Historic
5	C:13:343	Structures	Puebloan
5	C:13:344	Structures	Unknown
5	C:13:345	Structures	Unknown

Reach	*Site Number*	*Site Type*	*Cultural Affiliation*
5	C:13:346	Structures	Puebloan
5	C:13:347	Structures	Unknown
5	C:13:348	Structures	Puebloan
5	C:13:349	Structures	Puebloan
5	C:13:350	Thermal/Fire Features	Unknown
5	C:13:351	Artifact Scatters	Puebloan
5	C:13:352	Structures	Puebloan
5	C:13:354	Structures	Puebloan
5	C:13:355	Structures	Paiute
5	C:13:356	Structures	Puebloan
5	C:13:358	Structures	Puebloan
5	C:13:359	Structures	Puebloan
5	C:13:361	Structures	Puebloan
5	C:13:362	Structures	Puebloan
5	C:13:363	Structures	Puebloan
5	C:13:364	Structures	Puebloan
5	C:13:371	Structures	Puebloan
5	C:13:373	Structures	Hopi
5	C:13:377	Artifact Scatters	Puebloan
5	C:13:379	Structures	Puebloan
5	C:13:381	Structures	Unknown
5	C:13:384	Other	Puebloan
5	C:13:385	Structures	Puebloan
5	C:13:386	Structures	Puebloan
5	C:13:387	Structures	Puebloan
5	C:13:389	Structures	Puebloan

Reach	*Site Number*	*Site Type*	*Cultural Affiliation*
5	C:13:393	Artifact Scatters	Puebloan
6	B:15:091	Structures	Formative
6	B:15:096	Other	Historic
6	B:15:097	Other	Historic
6	B:15:119	Structures	Formative
6	B:15:120	Other	Unknown
6	B:15:121	Structures	Unknown
6	B:15:122	Structures	Historic
6	B:15:123	Other	Puebloan
6	B:15:124	Rock Art	Historic
6	B:15:126	Structures	Unknown
6	B:15:128	Structures	Archaic
6	B:15:132	Structures	Unknown
6	B:15:134	Structures	Unknown
6	B:15:139	Structures	Puebloan
6	B:15:143	Structures	Unknown
6	B:16:003	Structures	Puebloan
6	B:16:257	Structures	Formative
6	B:16:259	Structures	Formative
6	B:16:261	Structures	Unknown
6	B:16:262	Structures	Historic
6	B:16:364	Artifact Scatters	Unknown
7	B:10:111	Thermal/Fire Features	Unknown
7	B:10:224	Thermal/Fire Features	Unknown
7	B:10:225	Structures	Formative
7	B:10:236	Structures	Unknown

Reach	*Site Number*	*Site Type*	*Cultural Affiliation*
7	B:10:260	Structures	Unknown
7	B:10:261	Thermal/Fire Features	Puebloan
7	B:14:093	Thermal/Fire Features	Unknown
7	B:14:095	Thermal/Fire Features	Puebloan
7	B:14:105	Structures	Cohonina
7	B:14:107	Structures	Puebloan
7	B:14:108	Other	Unknown
7	B:15:127	Structures	Puebloan
7	B:15:135	Structures	Pai
8	B:10:121	Structures	Puebloan
8	B:10:229	Structures	Unknown
8	B:10:231	Artifact Scatters	Historic
8	B:10:237	Thermal/Fire Features	Puebloan
8	B:10:262	Structures	Puebloan
8	B:11:271	Structures	Formative
8	B:11:272	Thermal/Fire Features	Unknown
8	B:11:275	Structures	Unknown
8	B:11:277	Structures	Formative
8	B:11:278	Structures	Unknown
8	B:11:280	Structures	Unknown
8	B:11:281	Structures	Formative
8	B:11:282	Structures	Pai/Paiute
8	B:11:283	Other	Unknown
8	B:11:284	Structures	Unknown
9	B:10:227	Structures	Historic
9	B:10:230	Structures	Puebloan

Reach	*Site Number*	*Site Type*	*Cultural Affiliation*
9	B:10:249	Structures	Historic
10	A:15:003	Thermal/Fire Features	Puebloan
10	A:15:004	Structures	Pai
10	A:15:005	Structures	Pai/Paiute
10	A:15:017	Structures	Puebloan
10	A:15:018	Structures	Unknown
10	A:15:020	Thermal/Fire Features	Formative
10	A:15:021	Structures	Paiute
10	A:15:022	Thermal/Fire Features	Formative
10	A:15:025	Other	Puebloan
10	A:15:026	Thermal/Fire Features	Pai
10	A:15:027	Structures	Puebloan
10	A:15:028	Thermal/Fire Features	Pai
10	A:15:029	Thermal/Fire Features	Pai/Paiute
10	A:15:030	Thermal/Fire Features	Unknown
10	A:15:031	Thermal/Fire Features	Puebloan
10	A:15:032	Structures	Pai
10	A:15:033	Thermal/Fire Features	Puebloan
10	A:15:035	Thermal/Fire Features	Unknown
10	A:15:036	Structures	Unknown
10	A:15:037	Thermal/Fire Features	Puebloan
10	A:15:038	Structures	Puebloan
10	A:15:039	Thermal/Fire Features	Pai
10	A:15:040	Structures	Unknown
10	A:15:042	Structures	Puebloan
10	A:15:043	Structures	Pai/Paiute

Reach	*Site Number*	*Site Type*	*Cultural Affiliation*
10	A:15:044	Structures	Puebloan
10	A:15:047	Structures	Unknown
10	A:15:048	Thermal/Fire Features	Unknown
10	A:15:051	Structures	Puebloan
10	A:16:004	Thermal/Fire Features	Archaic
10	A:16:148	Thermal/Fire Features	Unknown
10	A:16:149	Thermal/Fire Features	Unknown
10	A:16:150	Thermal/Fire Features	Unknown
10	A:16:151	Structures	Pai
10	A:16:153	Structures	Formative
10	A:16:154	Structures	Paiute
10	A:16:155	Structures	Unknown
10	A:16:156	Structures	Unknown
10	A:16:157	Thermal/Fire Features	Puebloan
10	A:16:158	Artifact Scatters	Unknown
10	A:16:159	Structures	Puebloan
10	A:16:160	Thermal/Fire Features	Unknown
10	A:16:161	Structures	Unknown
10	A:16:162	Structures	Unknown
10	A:16:163	Structures	Puebloan
10	A:16:167	Thermal/Fire Features	Puebloan
10	A:16:171	Thermal/Fire Features	Pai/Paiute
10	A:16:172	Rock Art	Unknown
10	A:16:173	Thermal/Fire Features	Unknown
10	A:16:174	Thermal/Fire Features	Pai
10	A:16:175	Thermal/Fire Features	Puebloan

Reach	*Site Number*	*Site Type*	*Cultural Affiliation*
10	A:16:176	Structures	Unknown
10	A:16:180	Thermal/Fire Features	Unknown
10	A:16:184	Structures	Historic
10	A:16:185	Burials	Puebloan
10	B:09:314	Structures	Unknown
10	B:09:316	Structures	Formative
10	B:09:317	Structures	Pai/Paiute
10	B:13:001	Structures	Unknown
10	B:13:002	Thermal/Fire Features	Formative
10	G:03:002	Thermal/Fire Features	Pai/Paiute
10	G:03:003	Thermal/Fire Features	Formative
10	G:03:004	Thermal/Fire Features	Puebloan
10	G:03:020	Thermal/Fire Features	Unknown
10	G:03:024	Thermal/Fire Features	Puebloan
10	G:03:025	Thermal/Fire Features	Pai/Paiute
10	G:03:026	Thermal/Fire Features	Pai
10	G:03:027	Other	Unknown
10	G:03:028	Thermal/Fire Features	Formative
10	G:03:029	Thermal/Fire Features	Pai
10	G:03:030	Thermal/Fire Features	Unknown
10	G:03:032	Thermal/Fire Features	Pai/Paiute
10	G:03:034	Thermal/Fire Features	Puebloan
10	G:03:037	Structures	Cohonina
10	G:03:038	Thermal/Fire Features	Puebloan
10	G:03:040	Thermal/Fire Features	Unknown
10	G:03:041	Thermal/Fire Features	Pai

Reach	*Site Number*	*Site Type*	*Cultural Affiliation*
10	G:03:042	Other	Unknown
10	G:03:043	Thermal/Fire Features	Unknown
10	G:03:044	Thermal/Fire Features	Pai
10	G:03:046	Structures	Paiute
10	G:03:049	Structures	Puebloan
10	G:03:053	Artifact Scatters	Archaic
10	G:03:055	Thermal/Fire Features	Pai/Paiute
10	G:03:056	Thermal/Fire Features	Archaic
10	G:03:059	Structures	Unknown
10	G:03:060	Thermal/Fire Features	Puebloan
10	G:03:063	Thermal/Fire Features	Unknown
10	G:03:064	Thermal/Fire Features	Formative
10	G:03:071	Structures	Cohonina
10	G:03:076	Structures	Unknown
11	G:03:006	Thermal/Fire Features	Formative
11	G:03:019	Structures	Formative
11	G:03:033	Other	Unknown
11	G:03:048	Structures	Paiute
11	G:03:052	Thermal/Fire Features	Puebloan
11	G:03:054	Structures	Unknown
11	G:03:057	Structures	Formative
11	G:03:058	Structures	Unknown
11	G:03:062	Artifact Scatters	Historic
11	G:03:065	Artifact Scatters	Unknown
11	G:03:066	Structures	Unknown
11	G:03:067	Thermal/Fire Features	Puebloan

Reach	*Site Number*	*Site Type*	*Cultural Affiliation*
11	G:03:072	Thermal/Fire Features	Puebloan
11	G:03:073	Thermal/Fire Features	Puebloan
11	G:03:077	Rock Art	Unknown
11	G:03:078	Artifact Scatters	Pai
11	G:03:080	Thermal/Fire Features	Pai
11	G:03:082	Structures	Puebloan
11	G:03:083	Other	Historic
11	G:03:085	Artifact Scatters	Pai
12	G:02:001	Structures	Pai
12	G:02:009	Structures	Historic
12	G:02:100	Structures	Historic
12	G:02:101	Structures	Historic
12	G:02:102	Structures	Historic
12	G:02:103	Other	Historic
12	G:02:105	Structures	Historic
12	G:02:106	Structures	Historic
12	G:02:107	Structures	Unknown
12	G:02:108	Other	Historic

Appendix E

Tribal Policies and Resolutions Regarding NAGPRA and the Treatment of Human Remains

This appendix includes tribal policies and resolutions regarding the Native American Graves Protection and Repatriation Act (NAGPRA) and the treatment of human remains. The contents are summarized as follows:

- Statements and resolution are included from the Hopi Tribe and Zuni Pueblo.

- No statements and resolutions were received from the Hualapai Tribe or Navajo Nation.

- The Kaibab Paiute Tribe's (Southern Paiute Consortium) policy on NAGPRA is under review, but has not yet been adopted by the tribal council.

- The Paiute Indian Tribe of Utah (Southern Paiute Consortium) currently does not have a written policy regarding NAGPRA.

JUN 3 1994

HOPI TRIBAL COUNCIL
RESOLUTION
H-70-94

WHEREAS, the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25 U.S.C 3002; 104 Stat. 3045) provides federal mandates and guidelines regarding the repatriation (return) of sacred objects, objects of cultural patrimony, human remains and associated funerary objects to tribes; and

WHEREAS, NAGPRA requires consultation with tribes to determine the final disposition of these objects and human remains and associated funerary objects inadvertently discovered on lands under federal jurisdiction; and

WHEREAS, the Hopi people are blessed with rich cultural heritage based on tradition, esoteric knowledge and ceremony which demonstrate and validate Hopi interest into various southwestern cultural groups; and

WHEREAS, the Hopi Tribal Constitution and By-laws, as amended, state the Hopi Tribal Council's resolve to "...preserve the good things of Hopi life, and to provide a way of organizing to deal with modern problems..."; and

WHEREAS, the Constitution and By-laws further state the importance of lands outside the boundaries of the Hopi Reservation and specifically notes the significance of traditional use areas which contain shrines and other cultural properties (Article IV); and

HOPI TRIBAL COUNCIL
RESOLUTION
H-70-94

WHEREAS, Hopi philosophy and teachings provide a way to active participate in the decision-making process within the domina society as this knowledge teach respect for the deceased, t respect for archaeological sites and the respect for i past;and

WHEREAS, NAGPRA, through an administrative process; provides mechanism to address specific Hopi cultural concerns throu the negotiations and enactment of memorandum of agreements a memorandum of understandings; and

WHEREAS, the Hopi Tribal Council, since 1989; has supported the Ho Cultural Preservation Office which has represented trib interests on federal and state sponsored projects.

NOW THEREFORE BE IT RESOLVED by the Hopi Tribal Council that it hereb reiterates its constitutional resolve to protect the cultura interests of the villages, clans, and societies on matter related to the intent of NAGPRA.

BE IT FURTHER RESOLVED by the Hopi Tribal Council that it hereb declares its formal cultural affinity and affiliation with th Hisatsinom (anasazi), Fremont, Mogollon, Sinaguan, Salado Mimbres, Hohokam and Cohonino cultural groups.

BE IT FURTHER RESOLVED by the Hopi Tribal Council that it furthe declares it formal cultural affinity and affiliation with th Basketmaker, Archaic and Paleo-Indian phases of huma habitation.

HOPI TRIBAL COUNCIL
RESOLUTION
H-70-94

E IT FURTHER RESOLVED by the Hopi Tribal Council that it recognizes the significance and importance of NAGPRA and further state its direct support to the villages, clans, and societies whose responsibility it is to fulfill the intent of this law.

E IT FURTHER RESOLVED by the Hopi Tribal Council that it authorizes the Hopi Cultural Preservation Office to exercise administrative responsibilities to negotiate and enter into agreements as necessary to address the repatriation of sacred objects, objects of cultural patrimony, human remains and funerary objects and issues dealing with the inadvertent discovery and disturbance of graves and further declares its interests into cultural artifacts and human remains which were collected from the Hopi reservation and those sites within the cultural boundaries described above and which have been exchanged, traded or sold to foreign museums or private individuals by U.S. museums and other entities subject to NAGPRA.

E IT FURTHER RESOLVED by the Hopi Tribal Council that archival records, including field notes, audio tapes, video tapes, photographs; which describe and depict esoteric ritual, ceremonial and religious knowledge, be placed under restriction by museums and other repositories for public access and hereby are declared to be the cultural property of the Hopi people.

HOPI TRIBAL COUNCIL
RESOLUTION
H-70-94

BE IT FINALLY RESOLVED by the Hopi Tribal Council that it recognizes t key role of villages, clans, and religious societies in th effort and encourage their direct involvement in t consultation and repatriation process.

C E R T I F I C A T I O N

The foregoing resolution was duly adopted by the Hopi Tribal Council May 23, 1994, at a meeting at which a quorum was present with a vote 7 in favor, 3 opposed, 1 abstaining, Chairman presiding and not votin pursuant to the authority vested in the Hopi Tribal Council by Secti 1(a) of Article VI of the Hopi Tribal Constitution and By-Laws of t Hopi Tribe of Arizona, as ratified by the Tribe on October 24, 1936, a approved by the Secretary of the Interior on December 19, 1936, pursua to Section 16 of the Act of June 18, 1934. Said resolution is effecti as of the date of adoption and does not require Secretarial approval

Ferrell Secakuku, Chairman
Hopi Tribal Council

ATTEST:

Mary A. Belter, Tribal Secretary
Hopi Tribal Council

PUEBLO OF ZUNI

P. O. BOX 339
ZUNI, NEW MEXICO 87327

DONALD F. ERIACHO
Governor
BOBBY SHACK
Lt. Governor
ANDREW L. OTHOLE
Hd. Councilman
ARLEN P. QUETAWKI, SR.
Councilman

RUEBEN GHAHATE
Councilman
HARRY CHIMONI
Councilman
AUGUSTINE A. PANT
Councilman
JOBETH MAYES
Councilwoman

505-782-4481

In reply refer to:

PUEBLO OF ZUNI

STATEMENT OF CULTURAL AFFILIATION WITH PREHISTORIC AND HISTORIC CULTURES

July 11, 1995

The Pueblo of Zuni is regularly requested to consult with numerous agencies, museums, and other institutions regarding Zuni interest in, and cultural affiliation with, cultural resources (historic properties, traditional cultural properties, and sacred places), human burials and associated funerary objects, and cultural items (unassociated funerary objects, sacred objects, and objects of cultural patrimony). These consultations occur under the auspices of federal, state, and local legislation, including, but not limited to, the National Historic Preservation Act of 1966 (as amended), the American Indian Religious Freedom Act of 1978, the Archaeological Resources Protection Act of 1979 (as amended), and the Native American Graves Protection and Repatriation Act of 1990.

Based on Zuni oral teachings and tradition, ethnohistoric documentation, historic documentation, archaeological documentation, and other evidence, the Zuni Tribe claims cultural affiliation with prehistoric cultures of the Southwestern United States that include, and are known as, PalaeoIndian, Archaic, Basketmaker, Puebloan, Freemont, Anasazi, Mogollon (including Mimbres and Jornada), Hohokam, Sinagua, Western Pueblo, and Salado. In addition, the Zuni Tribe claims cultural affiliation with the historically identified Zuni, Cibola, Shiwi, and Ashiwi cultures.

Consultation under federal , state, or local legislation, regulations or guidelines regarding cultural resources, human remains, associated funerary objects, and cultural items will be conducted, coordinated, and facilitated by the Zuni Heritage and Historic Preservation Office, P.O. Box 339, Zuni, New Mexico 87327, (505) 782-4814, Fax (505) 782-2393, where Mr. Roger Anyon, Director, is the point of contact.

Sincerely,

Bobby R. Shack

for, Donald F. Eriacho, Governor
Pueblo of Zuni

printed on recycled paper

PUEBLO OF ZUNI

P. O. BOX 339
ZUNI, NEW MEXICO 87327

ROBERT E. LEWIS
Governor
PESANCIO LASILOO
Lt. Governor
JOSEPH DISHTA
Hd. Councilman
VAL R. PANTEAH, SR.
Councilman

EDISON R. WATO,
Councilman
AUGUSTINE A. PA
Councilman
CHARLOTTE T. BE
Councilwoman
OWEN R. BOBELU
Councilman

505-782-4481

In reply refer to:

PUEBLO OF ZUNI, NEW MEXICO

POLICY STATEMENT REGARDING THE PROTECTION AND TREATMENT OF HUMAN REMAINS AND ASSOCIATED FUNERARY OBJECTS

November 1992

1. PREAMBLE

The Zuni Tribe declares that the following statement is in no way to be construed as condoning nor endorsing any specific project or undertaking.

Any proposed project or undertaking that will entail the disturbance of human remains and associated funerary objects is a disturbance the Zuni Tribe opposes. Traditional Zuni lifeways have no provisions for the premeditated disturbance of human remains and associated funerary objects (burials). Even being asked to consider such disturbance requires the Zuni Tribe to think about burials in ways that have no place in traditional beliefs.

2. TRADITIONAL VIEW CONCERNING BURIALS

The traditional Zuni belief about life is that each person's life has four stages through which they must pass. The first stage is life as we know it here and now. Following this first stage are three others of which very little is known. It is essential for each person to pass through each of the four stages of their life cycle before it is complete. All burials to which the Zuni Tribe may have cultural affinity are at some point in their journey through the three latter stages of the life cycle.

To disturb burials while on their life cycle journey is not the traditional Zuni way. The ramifications of disturbing burials cannot be determined. How disturbance affects the life cycle journey, a journey that must be completed, is unknown, but it may well have detrimental ramifications which cannot as yet be foreseen.

3. GEOGRAPHIC AND TEMPORAL RANGE OF BURIALS CULTURALLY AFFILIATED WITH ZUNI

All burials within the the lands for which the Zuni Tribe has held aboriginal title from time immemorial and continuing through and including at least A.D. 1846 are potentially culturally affiliated with the Zuni Tribe. The Zuni Tribe claims cultural affiliation with all pre-Puebloan, prehistoric Puebloan and ancestral historic Puebloan burials within the area of Zuni aboriginal land title as determined by the United States Claims Court, whether in marked or unmarked locations. The only exceptions would be identifiable historic Athabascan, Hispanic, Anglo, or other burials not culturally affiliated with Zuni. The area of aboriginal title (see attached map) was exclusively used and occupied by the Zuni Tribe, for purposes such as habitation, life sustaining activities, and religious worship. (Opinion and Findings of Judge Judith Ann Yanello, United States Claims Court, May 27, 1987, Docket No. 161-79L, The Zuni Tribe of New Mexico v. the United States).

The Zuni Tribe also claims cultural affiliation with all pre-Puebloan, and Puebloan, and historic Zuni burials beyond the area of Zuni aboriginal title, within the entirety of the maximum geographic extent of the prehistoric Anasazi and Mogollon culture areas, and parts of the Hohokam culture area. Throughout the prehistoric period the Zuni Tribe was on its migrations from the place of emergence to find the middle place, present day Zuni, and prehistoric sites of these ancient cultures are regarded by the Tribe as ancestral Zuni.

4. PROCEDURES FOR PROTECTING BURIALS

Traditional Zuni belief is that the only appropriate procedure for protecting burials is to avoid disturbing them. The Zuni Tribe prefers that no ancestral culturally affiliated burials be disturbed.

5. EXCAVATION OF BURIALS

The Zuni Tribe understands that developments, projects and undertakings may not be able to avoid disturbance to all burials. Because avoidance of all burials may not always be possible it may be necessary for some burials to be disturbed.

The Zuni Tribe also understands that archaeological excavations of areas to be disturbed by some projects and undertakings may involve only a sample of the total number of archaeological sites located within the area of potential effect, and that even then only a portion of each site will be selected for archaeological excavation. This may leave many sites, and portions of sites, without archaeological investigation. Consequently many areas that potentially contain burials will remain unexcavated at the conclusion of archaeological sampling. To find burials that may not have been excavated during archaeological sampling, the Zuni Tribe wants to ensure that each and every site with the potential to contain burials (i.e., the areas and sites not sampled by archaeologists) be carefully and completely stripped so that these sites may be exposed in order for all burials to be identified and subjected to controlled archaeological excavation prior to disturbance.

The Zuni Tribe also recognizes that there is the potential for burials to be discovered in areas initially thought unlikely to contain burials. These discoveries must be accorded the same respect and dignity accorded all other

burials. Project activities in the area of the burial must cease immediately upon discovery of a burial to provide for controlled archaeological excavation.

If it is impossible for a burials to be avoided by project activities then each burial must be accorded as much respect and dignity as possible. Excavation of all such burials must be performed only by fully permitted professional archaeologists or physical anthropologists. In all instances burial excavations must be under conditions of a fully archaeologically controlled and approved provenience system. No preservatives or markings may be applied directly to the skeletal remains. The Tribe prefers that no pollen, flotation, or other soil samples be taken within a distance of less than one foot from the skeletal remains. Samples for pollen, flotation, or other purposes may, however, be taken from within any associated funerary objects.

6. DOCUMENTATION OF BURIALS

The Zuni Tribe is concerned with the identification and distinction of culturally affiliated burials from non-culturally affiliated burials (i.e., Athabascan, Hispanic, and Anglo burials, etc.), and the age and sex of each individual.

As stated above the Tribe believes that the most appropriate treatment for burials is to avoid them and not disturb them at all. If avoidance cannot be achieved then the Tribe will permit non-destructive analysis of the human remains and their associated funerary objects. Analysis must take place within the project area, which may include a field laboratory set up in the project area.

Detailed sketches, plan views, and profiles may be made of each in situ burial. Photographs of skeletal remains may only be made for required official scientific documentary purposes. Photography of the associated funerary objects for official scientific documentary purposes is acceptable.

For any burials covered under this policy no curation of any human remains will be permitted, nor will any associated funerary objects be permitted to be curated.

Under no circumstances at any time can any human remains and/or associated funerary objects be transported across or through any portion of the Zuni Indian Reservation (including trust lands around Zuni Salt Lake, New Mexico, and trust lands in Arizona).

7. DEFINITIONS

Burials are defined as being human remains and associated funerary objects.

Human remains are defined as the skeletal remains and other organic remains of a human being.

Associated funerary objects are defined as objects that, as part of the interment rite ceremony, are reasonably believed to have been placed with the human remains at the time of interment. These associated funerary objects include, but are not limited to, complete and broken and almost complete, ceramic vessels, projectile points, ground stone items, crystals, shaped or

unshaped minerals, animal bone artifacts, basketry, textiles, and mats, etc.

Non-destructive analysis is defined as that which keeps all human remains and associated funerary objects intact.

8. REBURIAL

The Zuni Tribe expects all culturally affiliated human remains and their associated funerary objects to be reburied. All reburied human remains and associated funerary objects must be reburied as close as possible to their original resting place but out of harm's way. Any reburial location must be protected in perpetuity.

It is preferred that the reburial area(s) are selected, identified, and secured prior to the initiation of archaeological excavation.

Human remains and associated funerary objects not culturally affiliated with Zuni must be separately reburied from any culturally affiliated burials.

Culturally affiliated burials must be reburied with the human remains being in the same position as when excavated and with the associated funerary object(s) in the same relative position(s) to the human remains as when excavated. The skull of each reburied individual must be oriented to the east. Reburial is to be conducted by fully permitted professional archaeologists.

Reburial must be at a minimum depth of six feet below modern ground surface. No vertical layering of reburials within the reburial area(s) will be permitted. Reburials shall not be in containers or wrappings of any kind.

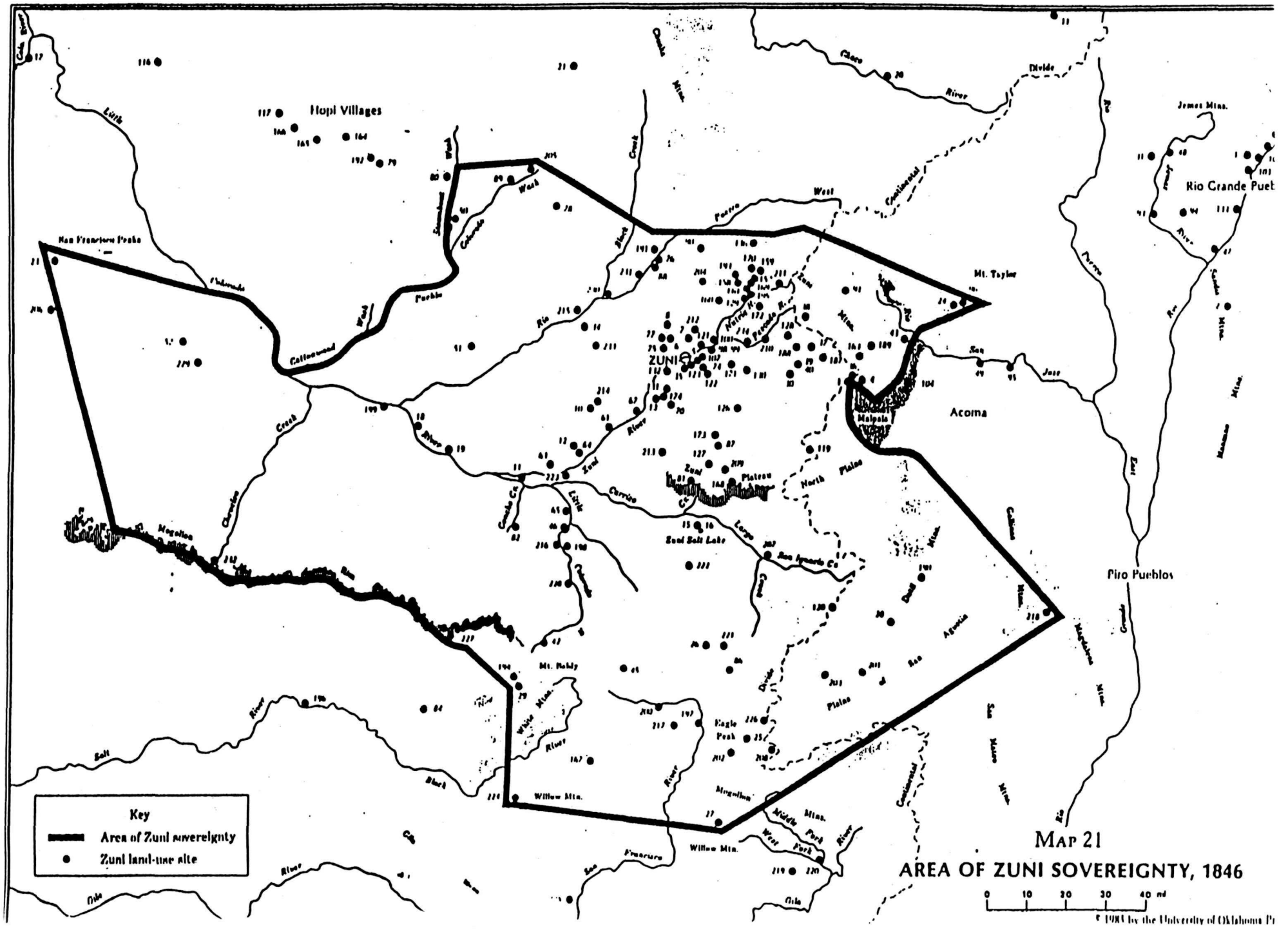
The Zuni Tribe has no objection to reburial ceremonies that may be conducted by other tribes with demonstrable cultural affiliation to the burials.

The reburial area(s) must be accurately located by legal description. Each reburial must be accurately mapped within the reburial area(s) and minimally have the reburial's original site number, archaeological excavation provenience, and date of excavation, marked on the reburial area(s) map(s). An aluminum tag noting the original site number, archaeological excavation provenience, and date of excavation, shall be placed near, but not touching, the feet or legs of each reburial.

The reburial area(s) must be accurately mapped and located so that the reburial area(s) can be protected from any future disturbance. No location maps or descriptions may note the actual purpose of the protected area to further protect the reburials from future disturbance.

9. COSTS

The Zuni Tribe expects that all costs associated with the identification, excavation, documentation, and reburial of all human remains and associated funerary objects will be borne by the development, project, or undertaking sponsor.



MAP 21

AREA OF ZUNI SOVEREIGNTY, 1846

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P.O. BOX 339
ZUNI, NM 87327

ZUNI TRIBAL COUNCIL
ZUNI, NEW MEXICO

November 17, 1992

RESOLUTION NO. M70-92-L164

WHEREAS, the Zuni Tribal Council, consisting of the Governor, Lieutenant Governor, and Six Tenienties, is declared to be the legislative authority of the Pueblo of Zuni by Article V, Section 1, of the Constitution of the Zuni Tribe; and

WHEREAS, the Zuni Tribal Council has the authority in accordance with Article VI, Section 1, d, of the Constitution to represent the Tribe, and to act in all matters that concern the welfare of the Tribe; and

WHEREAS, the Zuni Tribal Council has, on many occasions and through a number of Tribal Resolutions, declared its intent to preserve and protect the cultural and historic resources of the Zuni Tribe; and

WHEREAS, the Zuni Tribe has, over a number of years, developed a policy for the protection and treatment of culturally affiliated human remains and associated funerary objects; and

WHEREAS, the Zuni Tribal Council is aware that the Zuni Cultural Resources Advisory Team, as constituted under Zuni Tribal Council Resolution M70-91-L164, has reviewed and concurred with the policy entitled Pueblo of Zuni, New Mexico, Policy Statement Regarding the Protection and Treatment of Human Remains and Associated Funerary Objects, November 1992; and

WHEREAS, the Zuni Tribal Council has determined that, in order to ensure effective protection of culturally affiliated human remains and associated funerary objects it is necessary to have official Tribal Policy regarding such matters;

NOW, THEREFORE, BE IT RESOLVED, that the Zuni Tribal Council officially approves the document entitled Pueblo of Zuni, New Mexico, Policy Statement Regarding the Protection and Treatment of Human Remains and Associated Funerary Objects, November 1992 as the policy of the Zuni Tribe, and directs the Zuni Archaeology Program to administer and distribute this document as appropriate.

ZUNI TRIBAL RESOLUTION No. M70-92-L164, 1992
Page Two

ZUNI TRIBAL COUNCIL:

Pesancio Lasiloo, Lt. Governor

Joseph Dishta, Hd. Councilman

Val R. Panteah, Sr., Councilman

Edison R. Wato Sr., Councilman

Augustine A. Panteah, Councilman

Charlotte T Bradley, Councilwoman

Owen R. Bobelu, Councilman

CERTIFICATION

I hereby certify that the foregoing resolution was duly considered by the Zuni Tribal Council at a duly called meeting at Zuni New Mexico, at which a quorum was present and that the same was approved by a vote of 7 in favor and 0 opposed on November 17, 1991.

Robert E. Lewis, Governor
Pueblo of Zuni

APPROVED/VETOED BY:

Robert E. Lewis, Governor. 11-17-92
Date

Appendix F

Archeological Site Monitoring Forms

This appendix includes archeological site monitoring forms developed by the National Park Service in consultation with the other Programmatic Agreement signatories. These forms will be completed for each site during monitoring to establish a diachronic record of qualitative and quantitative change at the site. Should changes in the monitoring forms or recording methodology be suggested through advances in knowledge or technology, the National Park Service will consult with the Programmatic Agreement signatories prior to making any changes. The forms included in this appendix are as follows:

- River Corridor Archeological Site Monitoring Form
- Remedial Action Documentation
- Checkdam Installation Documentation
- Photographic Log
- Medium Format Photography Documentation
- Medium Format Photography Field Data

REMEDIAL ACTION DOCUMENTATION

1. SITE #: _____ 2. RIV. MI/BK _____

3. DATE: _____ 4. SESSION _____

5. RECORDER: _____

6. PA REPRESENTATIVES: _____

_____

7. REMEDIAL WORK: 1 = YES 0 = NO

____RETRAIL ____OBLITERATE TRAIL

____INSTALL CHECKS ____PLANT VEGETATION ____OTHER

8. TRAIL WORK: LOCATE ON SITE MAP

LOCATION: _____

_____

MAX DIMENSIONS: _____(L) _____(W) _____(D)

MATERIALS USED: _____

_____

NUMBER OF PERSONS: _____

TIME SPENT (HRS): _____ TOTAL: _____
(computer use only)

PHOTOS: ROLL#(S) and EXP.(S): _____
1 = YES 0 = NO ____COLOR SLIDES ____BLACK AND WHITE

9. PLANT VEGETATION: LOCATE ON SITE MAP

LOCATION: _____

_____

AREA IN SQUARE METERS: _____

MATERIALS USED: _____

_____

NUMBER OF PERSONS: _____

TIME SPENT (HRS): _____ TOTAL: _____
(computer use only)

PHOTOS: ROLL#(S) and EXP.(S): _____
1 = YES 0 = NO ____COLOR SLIDES ____BLACK AND WHITE

REMEDIAL ACTION DOCUMENTATION (CONT.)

10. CHECKDAM INSTALLATION: LOCATE ON SITE MAP

LOCATION: _____

_____

TOTAL LENGTH (METERS): _____
(computer use only)

TOTAL NUMBER OF CHECKS: _____

CHECK TYPE: 1 = YES 0 = NO
____BASKET WEAVE ____LOG CHECK ____ROCK CHECK
____ROCK LINING ____ROCK LINING WITH POSTS ____OTHER
(describe in 12)

NUMBER OF PERSONS: _____

TIME SPENT (HRS): _____ TOTAL: _____
(computer use only)

PHOTOS: ROLL#(S) and EXP.(S): _____
1 = YES 0 = NO ____COLOR SLIDES ____BLACK AND WHITE

SEE SEPARATE CHECKDAM DOCUMENTATION FORM TO COMPLETE CHECKDAM DESCRIPTIONS.

11. OTHER: LOCATE ON SITE MAP

LOCATION: _____

_____

TYPE OF WORK: _____

MAXIMUM LENGTH (METRIC): _____

MATERIALS USED: _____

_____

NUMBER OF PERSONS: _____

TIME SPENT (HRS): _____ TOTAL: _____
(computer use only)

PHOTOS: ROLL#(S) and EXP.(S): _____
1 = YES 0 = NO ____COLOR SLIDES ____BLACK AND WHITE

12. COMMENTS:

CHECKDAM INSTALLATION DOCUMENTATION

1. DRAINAGE DESCRIPTION
   FOR EACH MAJOR DRAINAGE SYSTEM LABEL ON THE SITE MAP, THEN DESCRIBE BELOW.
   * HEADCUTS GREATER THAN 25cm

DRAINAGE #	MAX. LxWxD (m)	RIVER OR TERRACE BASED	# OF HEADCUTS*	# OF CHECKS

2. INDIVIDUAL CHECK DESCRIPTION: NUMBER AND LABEL ON SITE MAP.

CHECK #	CHECK TYPE	MAX. LxWxD (m)	MATERIALS USED

Photographic Log

scription, use the following codes:

rface Erosion
llying
oyo Cutting
4. Bank Slumpage
5. Eolian Erosion
6. Eolian Deposition
7. Alluvial Erosion
8. Alluvial Deposition
9. Side Canyon Erosion
10. Animal Erosion
11. Collection Piles
12. Trails
13. Camping
14. ARPA
15. Other

Site	Dup.	Incr.	Decr.	Description	View	Location	Asses.	Photog.	Date

Grand Canyon National Park
RIVER CORRIDOR ARCHAEOLOGICAL SITE MONITORING FORM

MANAGEMENT

1. Site Number AZ: _____ 2. Monitor Session _____

3. River Mile _____ Bank (L/R/B): ____ 4. Date _____

5. Site Type _____

6a. Monitor (s) _____

6b. PA Signatories: _____

PHYSICAL IMPACTS

0 = Absent; 1 = Present; 2 = Increase; 3 = Decrease; 4 = NA (for items 7 - 14)

		Structures / Storage	Artifacts	Roasters/ Hearths	Perishables/ Midden	Rock Art	Other
7.	Surface Erosion (0-10cm)						
8.	Gullying (10-100cm)						
9.	Arroyo Cutting (>1m)						
10.	Bank Slumpage						
11.	Eolian/Alluvial Erosion/Deposition						
12.	Side Canyon Erosion						
13.	Animal-Caused Erosion (trailing,burrowing)						
14.	Other Natural Impacts (spalling, roots)						

If arroyos or gullies are present, do they drain to the river? (Note: Some drainages die out in dune fields or on terraces before reaching the river.) 0 = no; 1 = yes; 2 = NA _____

Do any of the above impacts appear to have occurred since the last monitoring episode? 0=no; 1=yes
If yes, explain in 17. _____

Comments:

VISITOR-RELATED IMPACTS

Site Number :

Monitor Session :

0 = Absent; 1 = Present; 2 = Increase; 3 = Decrease; 4 = NA (for items 18 - 24)

18.

	Structures / Storage	Artifacts	Roasters/ Hearths	Perishables/ Midden	Rock Art	Other
Visitor Impacts						

19. Collection Piles: If present, explain in 26. _____

20. Trails: If present, explain in 26. _____

21. On-site Camping: If present, explain in 26. _____

22. Criminal vandalism/ARPA violations: If present, explain in 26. _____

23. Other: If present, explain in 26. _____

24. Visitor-related impacts since last monitoring: _____

25. Are any visitor-related impacts directly related to river fluctuations and/or dam operations? 0 = no; 1 =yes If yes, explain in 26 (i.e., development of new trails to avoid high water, availability of new beaches in proximity of site). _____

26. Comments:

MANAGEMENT ASSESSMENT AND RECOMMENDATION

27. Monitor Schedule: 1) discontinue 2) semiannual 3) annual 4)biennial 5) every three to five years 6) inactive _____

28. Recommended measures to reduce site impacts: 0 = no; 1 = yes

Retrail _____ Plant vegetation _____ Other _____

Obliterate trail(s) _____ Install checkdams _____ Close site to visitors _____

29. Recommended measures to protect the site's integrity: 0 = no; 1 = yes

Surface collect entire site _____ Test for depth of subsurface cultural deposits _____

Map as a form of data recovery _____ Data recovery _____

30. Comments: (i.e., surface sample unit)

MEDIUM FORMAT PHOTOGRAPHY DOCUMENTATION

1. SITE #: 2. RIVER MILE\BANK: 3. DATE:

4. TIME: 5. SESSION: 6. PHOTOGRAPHER:

7: RECORDER:

8. PHOTOGRAPH: B\W__ ROLL #_____ EXP. #_____

COLOR ___ ROLL #_____ EXP. #_____

9. SEMI-PERMANENT PHOTO POINT ESTABLISHED: YES__ NO__

MATERIAL USED: SHIPPING NAIL ___

REBAR ___

OTHER ___ DESCRIBE: _____

10. TRIPOD LOCATIONAL: YES__ NO__ ROLL # _____ EXP.# _____

11. PHOTO DUPLICATION: YES__ NO__

PHOTO #_____

DATE _____

12. PHOTO POINT LOCATION: PLOTTED ON SITE MAP____

GPS PLOT ____

OTHER ____ DESCRIBE: _____

MEDIUM FORMAT PHOTOGRAPHY FIELD DATA

PHOTOGRAPHER_____ **CAMERA**_____
FILM_____ **LOCATION**_____

#	SITE #	PHOTO DESCRIPTION	B/W OR COLOR	DEG.	LENS	EXP.	DATE & TIME
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

COMMENTS:

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering wise use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. Administration.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

