

D-8B

**NATURAL BRIDGES NATIONAL MONUMENT
RESOURCE MANAGEMENT PLAN**

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3/1/96

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TABLE OF CONTENTS

I. Introduction	1
A. Monument Purpose and Significance	1
B. Administration and Management	4
C. Purpose of the Resource Management Plan	5
D. Management Objectives for Monument Resources	6
II. Present Natural Resource Status: Baseline Information	10
A. Historical Database of Natural Resources	11
B. Species Information	12
C. GIS Status	16
D. Air Quality	18
E. Sound	19
F. Precipitation and Meteorological Data	19
G. Fire Management	19
H. Backcountry Management	20
I. Paleontological Resources	20
J. Quaternary Resources	20
III. Condition of Natural Resources	21
A. Water Resources	21
B. Wildlife	21
C. Vegetation	22
D. Soils	23
E. Air Quality and Sound	23
IV. Present Status of Cultural Resources: Baseline Information	24
A. Cultural History	24
B. Servicewide Inventories of Cultural Resources	29
C. Servicewide Baseline Databases and Reports of Cultural Resources	34
D. Special Cultural Resources Studies and Plans, Including Museum Documents	37
E. Condition of Cultural Resources	44
V. Overview of Current Natural Resource Management Program and Needs	47
A. Major Program Activities	47
B. Natural Resource Staffing	51
VI. Overview of Current Cultural Resource Management Program and Needs	53
A. Major Program Elements	53
B. Cultural Resource Staffing and Funding	59
VII. References Cited	62
VIII. Project Statements and Appendices	64

I. INTRODUCTION

A. Monument Purpose and Significance

The Monument was created to preserve three extraordinary natural sandstone bridges: Sipapu, Kachina, and Owachomo. The three bridges form the largest concentration of natural bridges in the world. Sipapu is the second largest natural bridge in the United States. Kachina Bridge is the fifth largest. The Monument was also established to preserve outstanding ancestral Puebloan cultural remains located throughout the Monument.

The purposes for which the Monument was established are evidenced in the various presidential proclamations addressing the establishment and enlargement of the Monument. These are reviewed below.

1. Legislative History

The Monument was first established in 1908. A total of 120 acres was originally set aside around the three bridges based on President Theodore Roosevelt's original Proclamation No. 804, April 16, 1908, 35 Stat. 2183. The main purpose for the Monument was stated by President Roosevelt as follows:

"Whereas, a number of natural bridges situated in southeastern Utah having heights more lofty and spans far greater than any heretofore known to exist, are of the greatest scientific interest, and it appears that the public interests would be promoted by reserving these extraordinary examples of stream erosion with as much land as may be necessary for the proper protection thereof..."

Later, the Monument was enlarged to encompass 2,420 acres containing the three natural bridges, prehistoric structures, and cave springs, as stated in President William H. Taft's Proclamation No. 881, September 25, 1909, 36 Stat. 2502:

"...at the time this Monument was created nothing was known of the location and character of the prehistoric

ruins in the vicinity of the bridges, nor of the location of the bridges and prehistoric cave springs, also hereby reserved..."

The same area was resurveyed, and set aside by President Woodrow Wilson's Proclamation No. 1323, February 11, 1916, 39 Stat. 1764:

"...whose 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."

In August of 1962, President John F. Kennedy's Proclamation No. 320 withdrew 320 acres of land around Snow Flat Spring Cave and Cigarette Spring Cave from the Monument since these caves: "...no longer contain features of archeological value and are not needed for the proper care, management, protection, interpretation, and preservation of the Monument." In this proclamation, he expanded the size of the Monument, reiterated the public and scientific communities' interest in the preservation and protection of the bridges and prehistoric sites, and he set forth the main management objectives for the Monument, as discussed below.

2. Significance of The Monument

As previously stated, nowhere else are three such extraordinary natural bridges found in such close proximity to one another. These three bridges show three different stages of development from youth (Kachina), to maturity (Sipapu), to old age (Owachomo). Together with the canyons in which they formed, these three bridges are excellent examples of the result of an entrenched meander stream system.

The Monument was also created to protect its well-preserved ancestral Puebloan standing architecture. While archeologists now recognize that these structural sites are common throughout the region, their presence, as well as a range of archeological sites from Archaic through historic times, makes this area highly significant.

A high desert riparian environment combined with a year-round supply of standing water (the result of numerous seeps) creates a

unique biological climate where relict species (Douglas fir) maintain a foothold and where moist alcoves shelter hanging garden communities. It is here rare plants (such as the Kachina daisy) find refuge, and other water-loving flora thrive in riparian corridors that also provide food, shelter, and travel paths for wildlife. The Monument provides a breeding ground for peregrine falcons, is home to 15 species of bats, and has extensive public lands surrounding it that are candidates for Wilderness designation.

Pristine air quality ensures extensive vistas, and combined with the absence of artificial light provides outstanding opportunities to view night skies. The absence of human-generated sound leaves the visitor to confront the natural silence that is the hallmark of canyon country.

3. Setting

The Monument is located in San Juan County, Utah, 120 miles (200 kilometers) south of Moab, Utah. The area is accessible via Utah Highway 95 which connects Blanding, Utah with Hanksville, Utah. Blanding, Utah (population 3,100) is the nearest population center, located 40 miles (65 kilometers) east of the Monument. The surrounding area (San Juan County) is sparsely populated, with a density of less than 1.5 people per square mile (0.6 people per square kilometer). The area surrounding the Monument has never been settled by Anglos and has been used only for extensive livestock grazing and minor mining activities. The Monument is located in Utah's Third Congressional District.

Today, tourism is the most important economic component of southeastern Utah and the Four Corners area (where the states of Utah, Colorado, New Mexico, and Arizona meet). Farming, ranching and mineral extraction are also important economically, but these traditional sources of income are declining in importance. One reason for the rise in tourism in the region around the Monument is the density of other tourist attractions. Other major tourist focal points in the area are Lake Powell, Monument Valley, and the Canyonlands of Southeast Utah.

The Monument contains a total of 7,445.49 acres (3010 hectares) within its boundaries. An additional 191 acres (77 hectares) is included in the right-of-way for the entrance road. These acres

were withdrawn from further entry under the General Mining Laws to include the 1920 Mineral Leasing Act and the 1947 Acquired Mineral Leasing Act. This withdrawal was subject to valid existing rights.

The Monument contains two major canyons, White and Armstrong, which are deeply incised into the Cedar Mesa sandstone. The vegetation of the area is predominately pinyon-juniper woodland, a vegetation type common to most of southeast Utah at elevations of approximately 4,000 to 8,000 feet (1220-2440 meters). Riparian vegetation occupies the surface water drainages and small pockets of Douglas fir and associated mesic vegetation grow in sheltered areas along the canyon rims. The fauna of the Monument is typical of the Cedar Mesa area of southeastern Utah. Large mammals commonly seen are mule deer, coyote, and desert cottontail. Conspicuous birds are the common raven, turkey vulture, red-tailed hawk, and scrub jay. A variety of lizards can be seen during the warmer months, and the Monument is home to a large population of stunted prairie rattlesnakes. A complete description of the flora and fauna is detailed in the section describing Natural Resources.

The Monument was set aside in part for its spectacular ancestral Puebloan structural ruins. These ruins, as well as numerous smaller nonstructural sites left by peoples from the Archaic through the Protohistoric and Historic periods, comprise highly significant cultural resources. A detailed description of the archeological resources of the Monument is provided in sections that follow, along with management programs to preserve and protect these resources while allowing for increasing public visitation.

B. Administration and Management

Natural Bridges National Monument is administered as part of the Southeast Utah Group (SEUG) of the NPS along with Arches and Canyonlands National Parks. Economies of scale can sometimes be achieved in the SEUG by sharing human and material resources, most notably those concerned with some administrative, maintenance, and resource management functions.

A group superintendent (headquartered at Canyonlands National Park in Moab, Utah) provides overall direction for the SEUG. The superintendents of Arches National Park and Natural Bridges National Monument report to the SEUG superintendent.

At Natural Bridges, the chief ranger is responsible for the Resource Management Program, along with the Interpretation, Fee Collection, and Visitor Protection Programs. The chief receives support from the SEUG Resource Management Division, particularly from the field monitoring staff and the archeologist. Other than the chief ranger, there are no on-site staff dedicated to the resource management program.

C. Purpose of the Resource Management Plan

The purpose of this Resource Management Plan (RMP) is to describe the present status and condition of resources in the Monument, to describe cultural and natural resource management programs designed to preserve and protect the resources, to identify impacts to resources, and to identify specific management actions that are needed or are planned to preserve and protect the cultural and natural resources in compliance with NPS policies, standards, and other federal legislation and mandates. The contents of the RMP are specified by the Washington Office of the NPS, and by the Intermountain Field Area to ensure consistency across the NPS and the field area.

This RMP reflects joint cooperation between the NPS and affected private businesses and individuals, local, county, state, federal and tribal agencies for the coordinated management of the Monument's natural and cultural resources. The RMP is designed to be a working guide for the management of natural and cultural resources within the Monument. It will be used primarily by the chief ranger and superintendent of the Monument, the general superintendent of the SEUG, and by the Resource Management Division of the SEUG, although it is intended to be useful to other park staff as well.

The most important section of this RMP is comprised of the Project Statements. These statements, as well as the narrative that follows, describe actions that will be taken to fulfill the NPS's mandates to preserve and protect resources within the Monument. These statements serve as the basic funding requests for the Monument.

D. Management Objectives for Monument Resources

Resource management objectives for the Monument were stated by President John F. Kennedy's Proclamation No. 3486 as follows:

"Protection and interpretation of the natural bridges, Indian ruins, and preservation of the natural setting are the mandates from which all management objectives for the Monument derive. These principals are fundamental in any decisions regarding management of the park's resources."

In addition to managing and protecting the natural and cultural resources of the Monument, the NPS is required to comply with federal laws and mandates such as the National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), the Endangered Species Act (ESA), the Archeological Resources Protection Act (ARPA), and various NPS policies.

1. Management Objectives for Natural Resources

Management objectives for the Monument are to protect and preserve the outstanding natural bridges, the desert plant and animal communities, air and water resources, natural quiet, and Quaternary and paleontological resources in such a way that human impacts on these resources are minimized and that management is consistent with legislative and executive requirements and NPS policies and guidelines.

Specific management objectives for the natural resource program are:

Manage the developed areas for intensive visitor use while providing for the maximum protection of the natural environment.

Provide for the public use and enjoyment of the backcountry areas while minimizing the environmental impacts of visitor use and by providing for the maintenance of the primitive character of the backcountry as well as affording protection of the natural resources and ecological processes.

Provide for the protection and perpetuation of unique plant species and communities (including rare, threatened,

endangered and endemic species as well as pristine, disjunct and uncommon plant communities).

Provide for research efforts directed at understanding basic ecosystem processes at the Monument so human-induced impacts can be distinguished from natural processes, as well as to provide the interpretive staff with information concerning ecological processes occurring within the Monument.

Restore, wherever possible, the natural condition of Monument lands and plant communities altered by human activities.

Provide for mitigation of the impacts of exotic plants by feasible control methods wherever natural communities are threatened or where control methods are likely to be successful.

Provide for the protection of the Monument's resources by the provision of adequate fencing to control and prevent impacts due to trespass by livestock.

Provide for the maintenance of the quality of the air resources in the Monument such that the scenic quality of the viewshed is not hampered and deposition of particulate matter from combustion does not adversely impact Monument resources.

Provide for the protection of surface aquatic resources in the Monument such as streams, seeps, springs and potholes. Provide for the protection of the underground aquifer from pollution or drawdown so the natural surface waters are not altered.

Provide for the continued protection of the unique and high quality night sky and natural silence resources.

Provide for the protection of Monument lands and resources from outside threats due to land use and changes in ownership.

Provide for the collection and maintenance of information on the geologic and erosional features of the Monument thereby providing for documentation on the condition of those resources and natural changes that occur over time.

Provide for the continued inventory and monitoring of major

Monument resources (vegetation, wildlife, soils, clean air, clear vistas, natural quiet and clean water) to enhance the information database and to determine changes in critical resources such that management practices can be modified promptly to reverse and mitigate adverse impacts to those resources.

Identify quaternary and paleontological resources of the Monument. Particularly, research should be funded to locate, identify, analyze, and report on quaternary geomorphology (including paleosols), packrat middens, mollusks, pollen, tree-ring, and other records.

Educate the public and the staff about what has been and what can be learned from both Quaternary and paleontological resources of the Monument.

Teach the staff how to identify significant Quaternary and paleontological resources so that the resources can be reported, evaluated and monitored by scientists trained in Quaternary and paleontological research techniques.

2. Management Objectives for Cultural Resources

As with natural resource management, the objectives for the cultural resource management program are to preserve, conserve, and protect cultural resources of the Monument, while allowing the public to visit and enjoy their cultural heritage. Specific management objectives for the cultural program are listed below:

Continue to monitor and maintain at least 11 highly visited archeological sites in the Monument.

Expand the monitoring program to obtain more site-specific knowledge of the impacts visitors are having on the cultural resources of the Monument, and to devise management strategies to reduce visitor-related impacts to the sites.

Reduce looting and vandalism by increasing patrols by uniformed law enforcement officers.

Coordinate Archeological Resources Protection (ARPA) law enforcement activities with the BLM, San Juan Resource Area

and the USFS, Monticello Ranger District, the San Juan County sheriff, and other law enforcement agencies.

Perform an intensive archeological inventory of 100% of the Monument and document its cultural resources.

Nominate significant resources of the Monument to the National Register of Historic Places and otherwise provide legislative protection to the cultural resources of the Monument.

Provide direct physical protection for highly visited sites by all means available including: increasing the presence of uniformed, ARPA-trained rangers; reducing graffiti through the installation of signs and register boxes; redirecting the flow of foot traffic through and across sites through fencing; etc.

Coordinate management of cultural and natural resources within the Monument and with other federal, state, and tribal land managing agencies.

Ensure preservation of cultural resources through visitor education and through expansion and improvement of interpretation of cultural resources in the Monument.

Maintain an active program of Native American consultation and public involvement in the cultural resource management decisions of the Monument.

3. Management Objectives for Collections

Since museum collections from the Monument include both natural and cultural objects, collections management is an area that integrates both natural and cultural resources; however, collections management and curation have been assigned to the cultural resources management program and curatorial issues are described in the sections of this RMP relating to cultural resources.

The greatest need in collection management is to fund a professional curator to manage the collections to NPS and American Association of Museums standard. This need is listed below, along with some of the other important objectives in collections management.

Hire a base funded curator to manage collections and ensure accountability for NPS museum property.

Locate off-site collections and attempt to consolidate collections in one repository.

Perform special analyses of existing collections. Prehistoric ceramics need to be microscopically identified by someone trained in Southwest ceramic typology, lithics need to be properly typed as well. Natural history specimens such as snakes, birds, insects, plants, etc., need to be identified to the finest taxonomic level possible, preferably species or subspecies.

An historic photographic archive has been started, but additional work is necessary to locate additional important historic photographs, catalog them, and make them accessible to Monument staff, researchers and the public.

Obtain funding to process archival collections from the Resource Management division and other divisions besides Adminsitration.

Update and bring to standard existing accession and loan files or create these records were they do not exist.

Bring current natural history researchers' collections up to NPS museum standards.

II. PRESENT NATURAL RESOURCE STATUS: BASELINE INFORMATION

This section of the RMP summarizes the current status of baseline information for categories of natural resources within Natural Bridges National Monument. It identifies major resources, and assesses the completeness of baseline inventories. The categories of natural resources that are addressed are defined in NPS-75, the National Park Service Inventory and Monitoring Guideline. This document identifies the minimum baseline information needed for a viable RMP. This information is summarized in Table 1.

Table 1. Summary Table of Natural Resource Baseline Information.

Meets, does not meet, or exceeds the recommended minimal set of natural resource information in Appendix A of NPS-75.

INVENTORY COMPONENTS	DOES NOT MEET	MEETS	EXCEEDS
Historical Database	X		
Species Information			
Species List		X	
Biologic Surveys		X	
Species Distribution	X		
Digital Vegetation Maps		X	
Digital Cartographic Maps		X	
Digital Soil Maps		X	
Digital Geology Map	X		
Water Resource Inventory	X		
Water Quality Data		X	
Air Quality Stations		X (CANY)	
Air Quality Data		X (CANY)	
Precip./Meteorological Data		X	

Baseline resource information is essential in all these areas; first, to document these unique resources and assess their current status; second, to restore and maintain natural processes; and third, to prevent irreparable resource degradation through overuse. Three additional categories have been added due to their direct connection with resource management: Fire Management, Backcountry Management, and Paleontological/Quaternary Resources.

A. Historical Database of Natural Resources

Historical collections that contain natural resource information, including exploration records, Monument custodian journals, maps, photographs, and manuscripts, are currently scattered among the Monument's small library, the SEUG archives, and the SEUG Resource Management files. These collections need to be archived in a central repository and finding aids need to be prepared so the collections are easily retrievable, and thereby useful as resource management references.

Biological and geological specimens are maintained in the SEUG

museum storage facility at the headquarters of the SEUG in Moab, Utah. Many other natural resource specimens have been collected since the turn of the century, but these collections, if they still exist, are scattered in repositories across the United States. A thorough search for these off-site specimens is needed, and the specimens either need to be returned to the SEUG storage facility, or the loan records need to be updated and maintained so that both the specimens and the information about the specimens are useful.

B. Species Information

This section is broken into major natural resource groups. Some groups have been well-surveyed; others only marginally or not at all. The quantity and quality of information varies considerably. Available information on species within the Monument includes the following:

1. Vegetation Communities

Vegetation transects have been conducted annually since 1987 in White Canyon, in the pinyon/juniper community on the mesa top, and along the canyon rim. As of 1995, Natural Bridges' flora database contained 437 Taxa (species, subspecies, and varieties). Undoubtedly, this represents a provisional listing. Vegetation of the Monument is divided into five communities as described below.

a) Pinyon-Juniper Community

This community is the most extensive vegetation type, covering approximately 4,200 acres (1,700 hectares). The pinyon-juniper vegetation type is dominated by pinyon pine Pinus edulis and Utah juniper Juniperus osteosperma. Other major shrub components are broom snakeweed Gutierrezia sarothrae, roundleaf buffaloberry Shepherdia rotundifolia, big sagebrush Artemisia tridentata, and prickly pear cactus Opuntia sp.. Common forbs associated with this vegetation type are twinpod Physaria acutifolia, lobeleaf groundsel Senecio multilobatus, and Holboel rock cress Arabis holboellii.

b) Rimrock Community

Next in coverage, this community accounts for 2,700 acres (1,100 hectares). The rimrock community is a shrub-dominated type found on the canyon rims and is of varied composition. The primary components are pinyon P. edulis, Utah juniper J. osteosperma, manzanita A. patula, gambel oak Quercus gambelii, broom snakeweed

G. sarothrae, Utah serviceberry A. utahensis, longflower snowberry Symphoricarpos longifolius, and Haplopappos Haplopappos sp.

c) Riparian Community

Covers roughly 400 acres (160 hectares). The riparian vegetation communities are dominated by Fremont cottonwood Populus fremontii with the shrub understory being comprised of western sandbar willow Salix exigua, yellow willow S. lutea, and box elder Acer negundo. Of the many forbs and grasses that are incorporated in this vegetation community the principal species are phragmites Phragmites communis, horsetail Equisitum arvense and E. laevigatum, and hairy goldenaster Heterotheca villosa.

d) Douglas Fir Relict Community

Encompassing less than 400 acres (160 hectares), the Douglas fir community is a relict community (a holdover from a time when climatic conditions were more favorable; now these species exist within the Monument only in narrowly defined micro-environments). This community is characterized by Douglas fir Pseudotsuga menziesii, Utah serviceberry Amelanchier utahensis, mountain lover Pachystima myrsinites, dwarf mountain mahogany Cercocarpus intricatus and manzanita Arctostaphylos patula.

e) Hanging Garden Community

The smallest vegetal component covering less than 80 acres (30 hectares), the hanging garden vegetation type is characterized by moisture loving plants often not found elsewhere in the desert. These include plants such as the maidenhair fern Adiantum capillus-veneris, cliff-brake Pellaea sp., scarlet monkey flower Mimulus eastwoodiae death camas Zigadenus sp., columbine Aquilegia sp. and alcove bog-orchid Habenaria zothecina.

2. Vegetation Mapping

With the arrival of a GIS Specialist in 1994, a digitized vegetation map for the Monument was completed. Table 2 identifies vegetation types used on the map.

Table 2. Vegetation Classification Used for the GIS System, 1994.

Riparian
Grassland
Pinyon grassland
Douglas fir
Ponderosa pine
Pinyon juniper/sagebrush
Pinyon juniper/mixed shrub
Pinyon juniper/slickrock
Pinyon juniper/buffalo berry

3. Threatened and Endangered, Rare, and Endemic Plants

The rare Kachina daisy (*Erigeron kachinensis*) is found within the Monument. This species (candidate 2 federal status) was first described from Natural Bridges and is uncommon throughout its range. The Kachina daisy exists in the Monument in several moist alcoves associated with hanging garden communities and has been the subject of extensive research by Allphin and Harper (1994). It is endemic to San Juan County, Utah and Montrose County, Colorado and has previously been recommended for high priority species-level management (Heil et al. 1993).

4. Wildlife

Table 3 lists the number of species presently known for the Monument. Information is lacking on invertebrates. Information on these species follows.

Table 3. Number of Species in the Monument.

127 species of birds
68 species of mammals
17 species of reptiles
7 species of amphibians
0 species of fish

a) Birds

Common bird species likely to be found in the Monument are the Turkey Vulture Cathartes aura, Northern Harrier Circus cyaneus, Red-tailed Hawk Buteo jamaicensis, American Kestrel Falco sparverius, Mourning Dove Zenaidura macroura, Great Horned Owl Bubo

virginianus, Common Nighthawk Chordeiles minor, White-throated Swift Aeronautes saxatalis, Northern Flicker Colaptes auratus, Hairy Woodpecker Picoides villosus, Ash-throated Flycatcher Myiarchus cinerascens, Horned Lark Eremophila alpestris, Violet-green Swallow Tachycineta thalassina, Cliff Swallow Hirunda pyrrhonta, Scrub Jay Aphelocoma coerulescens, Pinyon Jay Gymnorhinus cyanocephalus, Common Raven Corvus corax, Plain Titmouse Parus inornatus, Canyon Wren Catherpes mexicanus, Western Bluebird Sialia mexicana, American Robin Turdus migratorius, Loggerhead Shrike Lanius ludovicianus, Bell's Vireo Vireo bellii, Solitary Vireo V. solitarius, Gray Vireo V. vicinior, Black-throated Gray Warbler Dendroica nigrescens, Green-tailed Towhee Pipilo chlorurus, Rufous-sided Towhee P. erythrophthalmus, Black-throated Sparrow Amphispiza bilineata, Dark-eyed Junco Junco oreganus, White-crowned Sparrow Zonotrichia leucophrys, and Brewer's Blackbird Euphagus cyanocephalus.

Annual bird surveys have been conducted since 1986. Two transects are monitored three times over a one month period. Among species of concern are the peregrine falcon (one breeding pair has been successfully nesting within the Monument since the 1993 breeding season), the bald eagle (occasionally seen, but not a resident), and the Mexican spotted owl (found in remote canyons nearby, but not within the Monument).

b) Mammals

Mammals have been systematically surveyed within the Monument from 1987-1994. The most common mammals inhabiting the Monument are the Western Pipistrel Bat Pipistrellus hesperus, Coyote Canis latrans, Gray Fox Urocyon cinereoargenteus, Whitetailed Antelope Squirrel Ammonospermophilus leucurus, Colorado Chipmunk Eutamias quadrivittatus, Canyon Mouse Peromyscus crinitus, Deer Mouse P. maniculatus, Pinyon Mouse P. truei, Desert Woodrat Neotoma lepida, Porcupine Erethizon dorsatum, Blacktailed Jackrabbit Lepus californicus, Desert Cottontail Sylvilagus auduboni, and Mule Deer Odocoileus hemionus.

c) Amphibians and Reptiles

Common herptofauna of the Monument are the Red Spotted Toad Bufo punctatus, Woodhouse Toad B. woodhousei, Great Basin Spadefoot Toad Scaphiopus intermontanus, Tiger Salamander Ambystoma tigrinum, Plateau Striped Whiptail Cnemidophorus velox, Collared Lizard Crotaphytus collaris, Short-horned Lizard Phrynosoma douglassi,

Sagebrush Lizard Sceloporus graciosus, Eastern Fence Lizard S. undulatus, Tree Lizard Urosaurus ornatus, Desert Night Lizard Xantusia vigilis, Side-blotched Lizard Uta stansburiana, Western Whiptail Cnemidophorus tigris, Gopher Snake Pituophis melanoleucus deserticola, Western Terrestrial Garter Snake Thamnophis elegans vagrans, and the Stunted Prairie Rattlesnake Crotalus viridis viridis.

C. GIS STATUS

1. Digital Cartographic Data

Table 4 lists the data that have been digitized as of 1996 while Table 5 lists GIS natural resource data that need to be digitized. Additional information on these needed data is provided below.

Table 4. GIS Data.

- Elevations
- Monument transportation system (roads and trails)
- Boundary
- Contour data
- Building locations/infrastructure
- Vegetation

Table 5. GIS Data Needed.

- Soils
- Geology
- Hydrology

a) Digital Soils Map

Soils at the Monument are poorly developed and are derived from residuum of the Moenkopi formation, a sandstone, mudstone, and siltstone deposit of the Triassic Era. A soil survey has been completed and will soon be digitized.

b) Digital Geologic Map

A digital geologic map has not yet been prepared for the Monument. Monument elevations range between 6,000 feet (1,830 meters) to 6,600 feet (2,010 meters). The land surface of the Monument is a deeply incised plateau with two major canyons, White and Armstrong, which intersect in the western part of the Monument and contain an

intermittent stream flow. White Canyon is a major topographic feature of western San Juan County.

The geologic features of the Monument are the result of stream erosion of the massive Cedar Mesa Sandstone, a member of the Cutler formation which dates to the Permian Era. The formation is estimated to be 280 million years old. The canyons of the Monument are similar to the canyons of the surrounding area in that they are deeply incised into a relatively flat plateau. This is the result of uplifting of the area by the Monument Upwarp and the subsequent rapid downcutting that resulted.

The bridges were formed primarily by streambed erosion (running water) and are geologically distinct from arches, which are formed by the action of seeping moisture, frost, and chemical weathering. The Cedar Mesa sandstone is between 500-1,000 feet (150-300 meters) thick and considered to be the lithified remains of a coastal barrier island system.

c) Hydrology

While USGS hydrographic data on the Monument exists, it has not been digitized. Water resources are the key constituents influencing all natural systems, especially in the desert environment. The watershed of Natural Bridges consists of several well developed canyons and their tributaries, all of the Cedar Mesa Sandstone formation at depths up to 600 feet. These canyons contain intermittent streams; none of the headwaters are within the Monument, so activities on adjacent lands pose potential risks to water resources at the Monument.

Grazing is the major land use adjacent to the Monument, past mining activity occurred within several miles of the boundary, and some oil and gas exploration has occurred in the recent past. One well, within one mile of the Monument, was improperly capped, allowing brine seepage to the surface resulting in localized vegetation destruction (it has since been properly capped).

Springs, seeps, and hanging garden plant communities are subject to adverse affects due to potential drawdown of the aquifer to support groundwater wells for human and livestock use. Riparian and hanging gardens are considered to be wetlands and are subject to Federal wetland protection guidelines.

The Resource Management Division of the SEUG has been monitoring since 1983 the chemical and physical parameters twice a year of the following five springs and seeps within the Monument:

Table 6. Water Monitoring Sites.

Horsecollar Seep
Kachina Bridge seep
Owachomo Bridge Seep
Sipapu Bridge Seep
To-Ko-Chi Canyon Spring

Table 7 lists the physical and chemical parameters are monitored.

Table 7. Water Monitoring Data.

water temperature
water flow
pH
dissolved oxygen
specific conductance
copper
nitrate
sulfate
manganese
iron
phosphate
alkalinity
hardness
chloride

D. Air Quality

Air quality is not currently monitored at the Monument, but is nearby at Canyonlands. Data was recorded at Natural Bridges throughout the 1980's, but was judged too subjective to be of more than anecdotal value. It is worth mentioning, however, that declines in observed range of visibility coincided with the establishment of both the Navajo Generating Station near Page, Arizona and the Four Corners Power Station (both coal-burning power plants) to the south.

Nevertheless, southeast Utah is noted for its relatively clean air.

That, coupled with Natural Bridges' isolation and the relative absence of artificial light, ensures an outstanding night sky resource above the Monument. Being located atop a plateau, one has a nearly 360 degree view of the stars. This experience intensifies the perception that this place is indeed special and worth preserving.

E. Sound

A sound monitoring station was set up in the fall of 1994 and ran a year before being moved elsewhere in the SEUG. Ambient noise levels in the Monument are low. The degree of silence one encounters in most areas of the Monument is one of it's greatest resources. Most noise detected at the monitoring site was the result of aircraft overflights and automobiles. Other sound was associated with the effects of weather, wildlife activity, and backcountry hikers.

Within the developed area, most noise can be attributed to the diesel powered generator (although the Monument is solar-powered, the backup generator runs between 5-10% of the time). Other noise is associated with visitor activity.

F. Precipitation and Meteorological Data

The climate of the Monument is arid and is characterized by hot, dry summers and cold winters. The average annual total precipitation is 13.15 inches (33.4 centimeters). The majority of the precipitation falls between the months of July and December, mostly as summer thunderstorms. Snow falls between October and May with an average annual total snowfall of 51 inches (129.5 centimeters). Major snowfall occurs in the months of November through March. The mean annual temperature is 56° Fahrenheit (13° centigrade) and the extremes range from -16° Fahrenheit (-26.7° centigrade) to 105° Fahrenheit (40.6° centigrade). Potential evapotranspiration exceeds precipitation, making soil moisture a crucial environmental factor.

G. Fire Management

Some fire history information is available from 1923 onward, but it is sketchy. In part this is due to the nature, type, and spacing of vegetation and the topography. Fire has not been a significant

influence within the Monument in historic times. When fires have occurred, typically they have been the result of lightning strikes and involve single trees. Previous fire records indicate no single occurrence involving more than half an acre.

H. Backcountry Management

Ninety percent of the Monument's area is designated as backcountry, but because of the Monument's small size and its wealth of cultural and other nonrenewable resources, overnight camping, rock climbing, mountain biking, and other activities associated with backcountry use are not permitted within the backcountry. Pets are not allowed in the backcountry. For the most part, visitor use is confined to the roads, designated trails, and the canyons within the Monument.

Natural Bridges is managed as one unit within the Southeast Utah Group (SEUG) of the National Park Service. As use of the entire group's backcountry increases or otherwise changes, modifications may have to be made in Natural Bridges' backcountry management.

I. Paleontological Resources

Stratigraphic features of the Monument date to the Permian and Triassic. The only exposed formations are the Cedar Mesa and the Moenkopi. While paleontological resources are known from these formations, little is known of the paleontological resources within the Monument.

J. Quaternary Resources

Knowledge of Quaternary resources (those resources of the Pleistocene and Holocene epochs) was recently improved through a regional contract with Northern Arizona University which defined the potential Quaternary resources of the Monument. The most significant Quaternary resource is the presence of Oreamnos harringtoni. Bones of this extinct species were dated to 39,800 years B.P. and were discovered in the Monument in a dry alcove. This is the oldest known find of this species and the only location of this animal outside of the Grand Canyon. Packrat middens dating to the same period have been found at the same alcove site and pollen from the middens provides information on regional flora at that time.

III. CONDITION OF NATURAL RESOURCES

This section of the RMP gives an overview of the current condition of the natural resources within Natural Bridges National Monument. For many of the resources only marginal baseline information exists; for some none at all. Similarly, monitoring activities vary considerably.

A. Water Resources

As previously stated, five seeps within the Monument have been monitored since 1983. An extensive analysis of the data collected is currently underway. It is believed that the water quality, as measured by the parameters used, has not declined during that period. Monument staff and visitors alike continue to exercise water conservation measures so as to prevent aquifer drawdown. The Monument's wells continue to provide an adequate potable water source with sufficient recharge. Drinking water is tested according to State standards.

Sensitive areas (such as alcove seeps containing hanging garden communities) have been identified and mapped. It appears that the patterns, timing, and quantity of precipitation affect these resources most. A delay in drought indicators of up to two years can be seen with some species.

Effective fencing has excluded trespass cattle and the associated effects on water quality, and a tamarisk eradication program has kept this invader of riparian areas in check.

B. Wildlife

There is only one animal on the federal threatened and endangered list that is found within the Monument, the peregrine falcon. A breeding pair have successfully nested in 1993, 1994, and 1995 with a total of five young fledged. Nesting sites have been in a remote area in upper White Canyon that experiences little human disturbance. The Mexican spotted owl has also been located in the area, but surveys have failed to indicate its presence within the Monument.

Mammals have been surveyed annually from 1987-1994. Aside from the

species previously listed, the Monument is known to provide habitat to a large diversity of bats. According to Mike Bogan of the USFWS, Natural Bridges is a "hot spot" for bats on the Colorado Plateau. Of the 19 species thought to live in Utah, 15 have been captured in the Monument (including the spotted bat, a candidate species for federal listing). Mountain lion tracks are commonly seen within the Monument; actual sightings are rare. Black bear occasion the canyons and rim, but they, too, are rarely seen. Desert bighorn sheep were observed within the Monument prior to 1966 when the loop road was constructed. They probable still roam sections of lower White Canyon and surrounding environs.

Among the Monument's reptile and amphibian species is a rare stunted form of the prairie rattlesnake. Past reports have incorrectly referred to this species as the midget faded rattlesnake, however, based on the work of James L. Glenn of the Venom Research Lab, VAMC, Salt Lake City, its venom composition and morphology indicate the population should presently be referred to as (a stunted form of) *Crotalus viridus viridus* and not *Crotalus viridus concolor*. Past research by Tim Graham indicated fairly high numbers of individuals passing through the developed area of the Monument. While this was not necessarily a concern for humans (the species is quite docile) there was a concern that moving the snakes beyond the immediate area posed threats to their survival. As a result, a standard operating procedure was developed that guides the removal of snakes from areas where they are likely to encounter humans. Movement beyond 100 meters is rarely necessary.

There are no fish species within the Monument and little is known of the Monument's invertebrates.

C. Vegetation

Monitoring of the Monument's vegetation has occurred annually since 1987. The most apparent forces affecting the condition of vegetation are the invasion of exotics and ground disturbances in the developed areas that allow some aggressive species to proliferate.

The exotic plant species of most concern are tamarisk, horehound mint, and musk thistle. Many other exotics are present, but pose little threat to native species. The eradication of tamarisk is of primary concern because of its ability to quickly invade and crowd

out other species along riparian corridors. At present, mechanical/chemical means are being used to keep the exotics of concern in check. The program has been successful thus far; tamarisk is found in small numbers, infrequently, and usually quite young when discovered.

A major Federal Lands Highways Project (FLHP) completed in 1995 involved major changes along Bridge View Drive (a scenic 9-mile loop) and impacted vegetation considerably. Revegetation efforts are on-going in an attempt to promote rapid recovery of native ground cover.

D. Soils

As previously stated, a soil survey has recently been done for the Monument. Like much of the Colorado Plateau, erosional activity predominates over sedimentary deposition, accumulation, and other processes necessary for the development and maturation of thick soils. Relatively low primary production and low biomass per unit characterize the soils of the Monument due to aridity and relatively low levels of organic materials. The soils of the Monument are a fragile resource upon which all of the vegetation and wildlife ultimately depend.

Integral to the protection of soils is the ground cover consisting of both vascular plants and cryptobiotic amalgams. Areas of high visitor use such as trails, overlooks, and the campground show evidence of significant disturbance of ground cover leading to denuded, compacted soils and erosion. Switchback cutting and trail braiding are occurring on trails leading down to the bridges as well as trails that follow the canyon bottoms. Soil damage in developed areas has been mitigated somewhat by the installation of barriers and signing. Revegetation efforts to date have met with moderate to low success.

E. Air Quality and Sound

Air quality monitoring was discontinued at the Monument in the late 1980's, but continues nearby at Canyonlands. Data, thusfar, do not indicate a significant change in air quality, however, it is worth mentioning that declines in observed range of visibility coincided with the establishment of both the Navajo Generating Station near Page, Arizona and the Four Corners Power Station (both

coal-burning power plants) to the south.

Nevertheless, southeast Utah is noted for its clean air. That, coupled with Natural Bridges' isolation and the relative absence of artificial light, ensures an outstanding night sky resource above the Monument. Being located atop a plateau, one has a nearly 360 degree view of the stars. These attributes greatly contribute to the visitors' experience at the Monument.

Ambient noise levels in the Monument are low. The degree of silence one encounters in most areas of the Monument is one of its great resources. Most noise detected at the monitoring site was the result of aircraft overflights and automobiles either within the Monument or passing nearby on highway 95.

Pristine air quality ensures extensive vistas and combined with the absence of artificial light provides outstanding opportunities to view night skies. The absence of human-generated sound leaves the visitor to confront the natural silence that is the hallmark of canyon country.

IV. PRESENT STATUS OF CULTURAL RESOURCES: BASELINE INFORMATION

A. Culture History

Culture history of the Monument is divided into the standard temporal periods for Southwestern archeology, namely Archaic, Late Prehistoric, Protohistoric, and Historic periods. The Monument, like most of the Southwest, was repeatedly occupied and abandoned during these periods (cf. Berry 1982). Evidence for each of these temporal periods and occupations is briefly summarized below. However, before turning to this summary, it should be noted that very little of the Monument has been systematically and intensively inventoried for cultural resources, therefore much of the culture history of the Monument is derived from data from inventories conducted on adjacent lands managed by the BLM.

1. Archaic and Basketmaker II Periods

The Grand Gulch Plateau and Natural Bridges National Monument were first inhabited during the Archaic period, dating as early as 7000

B.P. Archaic people hunted game and gathered wild plant resources within the Monument and across Cedar Mesa and the Grand Gulch Plateau. Since the biotic resources used by Archaic hunter-gatherers were scattered in low densities and were only seasonally available, Archaic archeological sites are characteristically small, low density scatters of stone tools and debris left from the harvesting, preparation, and consumption of wild plants and animals.

While most of the culturally diagnostic materials of Basketmaker II were defined by poorly-controlled turn-of-the-century excavations in dry cave sites from nearby Grand Gulch, well-controlled excavations and inventory by the Cedar Mesa Project (Lipe and Matson, various) described the typical Basketmaker II site as a surface lithic scatter (debris left over from making stone tools) in the uplands or mesa tops.

Like Archaic lithics, Basketmaker II lithic technology was predominately a biface production technology. Since most of the Archaic and Basketmaker II sites on Cedar Mesa and within Bridges are open, surface lithic scatters, finding ways to carefully and scientifically distinguish between Archaic and Basketmaker II occupations is a major research question for the Monument.

2. Late Prehistoric Period

During the Late Prehistoric period, Natural Bridges and the Grand Gulch Plateau appear to have been occupied and abandoned at least three times in response to climatic fluctuations, fluctuations in population pressure from adjacent areas, or resource depletion associated with slash-and-burn farming (Matson, Lipe and Haase 1988; Matson and Lipe 1975, 1978). Sorting out the relationship between Late Prehistoric period Mesa Verde and Kayenta occupations, and between local ceramic production and importation are important issues in Bridges archeology.

The earliest Late Prehistoric occupation of Bridges falls within the Basketmaker III period from about A.D. 650-750. This occupation is marked by at least one BMIII slab-lined pithouse village. Based on results of the Cedar Mesa Project (Matson and Lipe 1975, 1978; Matson, Lipe and Haase 1988), there is probably a significant concentration of BMIII limited activity sites resulting from dry-farming the mesas within the Monument.

Based on analysis of extant collections of Bridges' ceramics, the BMIII occupation is represented by Chapin Black-on-white ceramics which were probably manufactured by Mesa Verde Anasazi living east of Comb Ridge and imported onto Cedar Mesa and into the Monument. Sand tempered Lino grey style ceramics are also present, either indicating a Kayenta affiliation or local production of sand-tempered culinary pottery. While a few dendrochronological samples have outside rings dating to the BMIII period, there are no cutting dates from Natural Bridges from this period so far.

Natural Bridges, like Cedar Mesa, appears to have been largely abandoned during the Pueblo I period. Only an ephemeral occupation from Pueblo I to early Pueblo II (A.D. 750-1000) is evident.

The dominant occupation of Bridges appears to have been a typical Kayenta Anasazi occupation resulting from migration into the area beginning about A.D. 1060, or during the Late Pueblo II to early Pueblo III period. In Bridges, this occupation is documented by a number of sites with typical Kayenta jacal architecture and with imported Kayenta ceramics. Ceramic assemblages are dominated by sand-tempered, corrugated gray ware, and classic Black Mesa, Sosi and Dogoszhi Black-on-white, and Tusayan Black-on-red, Citadel, Cameron, and Tusayan polychromes. Classic Mesa Verde ceramics (Mancos Black-on-white, Dolores Corrugated) are also present, but in lower frequencies than Kayenta wares. A few tree-ring dates from sites in Bridges are available from this period, but almost none of the dates are cutting dates, so probably older wood was used in construction of these structures.

Based on ceramic assemblages from Bridges, on tree-ring studies from Cedar Mesa (Ahlstrom 1994), and other results of the Cedar Mesa Project (Lipe, Matson, various), there is probably a relatively low number of sites within the Monument dating from the period A.D. 1060-1109. There should be a slight increase in the number of sites dating to the period from A.D. 1110-1139 and from A.D. 1140 to at least A.D. 1165, and possibly until A.D. 1209, Bridges, like the rest of Cedar Mesa, was virtually abandoned.

After this period of abandonment, there appears to have been a migration of Mesa Verde Anasazi into the area beginning at A.D. 1210, with a peak in construction and occupation between A.D. 1240-1269 (Ahlstrom 1994). Ceramically, this occupation is documented by the presence of Mancos, McElmo and Mesa Verde Black-on-white

ceramics. Many of these ceramics have a distinctive dark gray, vitrified, sherd-tempered paste that may indicate local production, rather than manufacture or importation of these ceramics from the east (Kramer, Osborn, and Hurst 1991; Bond 1993).

3. Protohistoric and Ethnohistoric Period

Considerable work is necessary before the Protohistoric occupation of the Monument can be defined with precision. According to Julian Steward (1938), the triangle formed by the Dolores River on the north, the Colorado River on the west and the San Juan River on the south was occupied by both Utes and Paiutes; however, Steward's own testimony in the U.S. land claim commission hearings indicate the Bridges area was occupied only by the Ute.

Archeological evidence indicates a Numic occupation from about A.D. 1400 to historic times, but of course, Ute and Paiute cannot be separated archeologically. The Navajo appear to have been in the general area from about A.D. 1500 onwards (Tipps 1988). It is likely that the Monument contains Navajo sites dating to the 1800s since Kigalia and his band were living on nearby Elk Ridge at this time.

These Protohistoric peoples moved about the Colorado Plateau to obtain scattered and seasonally available natural resources. Given their subsistence pattern, Protohistoric sites are usually small, ephemeral surface scatters of stone tools and flaking debris. Protohistoric sites are distinguished from Archaic sites by technological differences: Protohistoric peoples used the bow and arrow with small arrow points, as opposed to the large dart points used for the atlatls or spear throwers of the prehistoric Archaic people. Protohistoric sites can also be distinguished from Archaic sites by the presence of brownware pottery, and in some cases, by the presence of Hopi yellow wares. The presence of Hopi yellow wares does not necessarily indicate occupation by the Hopi, rather, it points to the extensive trade networks operating throughout the Colorado Plateau during the Protohistoric period.

Evidence of such Protohistoric and ethnohistoric use of Natural Bridges is presently limited, although an intensive cultural resources inventory of the Monument may well reveal more information about Protohistoric and Historic period Native American use of the Monument.

4. Historic Period

Hobler and Hobler (1978) and the Mehls (1986) have documented the historic period for the Monument and the following summary of early Monument history is based on their reports.

While Native Americans had been in the area for thousands of years, and while Euro-American ranchers grazed their cattle in Tuwa Canyon as early as 1878, the first documented visit to Natural Bridges was by four mineral prospectors: Cass Hite, Indian Joe, Edward Randolph, and Scotty Ross in September of 1883. From 1892 to 1893 W.C. McLoyd and C.C. Howard Graham collected prehistoric artifacts from Bare Ladder ruin and other archeological sites within upper White Canyon.

The next documented visits to the bridges were in 1895 by Emery Knowles and by Bluff cattlemen James Scorup, Tom Hall and Jim Jones. Then in March of 1903 Scorup led mining engineer Horace Long to the bridges. In 1904 Dyar published an article on the bridges in both National Geographic and The Century Magazine. These articles stimulated public interest in the bridges and prehistoric ruins and lead to two exploring expeditions. The first expedition was in 1905 by the Commercial Club of Salt Lake City, Utah. This expedition mapped and photographed the bridges and some of the prehistoric ruins. The expedition also left an inscription on Sipapu Bridge. In 1907 Byron Cummings, then of the University of Utah, explored the central portion of upper White Canyon, mapping the bridges and describing some of the more spectacular and accessible prehistoric ruins. Also in 1907 National Geographic published an article by Holmes which advocated the formation of a national park to encompass the bridges. This suggestion was followed by President Theodore Roosevelt's proclamation of the area as Natural Bridges National Monument on April 16, 1908. Following the proclamation, the General Land Office sent W.B. Douglass to survey and map the area in September of 1908. In September 25, 1909 the Monument boundaries were enlarged to include additional archeological sites described by Douglass. It was at this time that the bridges were given their present names: Sipapu, Kachina, and Owachomo.

From 1910 to 1940 the Monument was visited by an increasing number of scientists or exploring parties including Herbert Gregory, Byron Cummings, Alfred Kidder, and the Bernheimer Expedition. The

Monument also began to be visited by the public. Visitation was encouraged by Zeke Johnson, the first custodian of the Monument (1923-1941). Johnson was instrumental in exploring the Monument and in bringing knowledge of the resources of the Monument to the public's attention. In recognition of his importance, as well as the rise of the environmental and conservation movement in the United States, a trail developed by Zeke Johnson, the Owachomo Bridge Trail, has been listed on the National Register of Historic Places. In response to promotion of the Monument by Johnson, as well as to growing knowledge of the Colorado Plateau as a whole, both popular and scientific visits to the Monument have increased until in 1995 nearly 150,000 people visited the Monument.

B. Servicewide Inventories of Cultural Resources

1. Cultural Sites Inventory Base Maps (CSI)

Based on a variety of laws and policies, including the Antiquities Act of 1906, the Historic Sites Act of 1935, the National Historic Preservation Act of 1966, Executive Order 11593, and the Archeological and Historic Preservation Act of 1974, the NPS is required to inventory lands it manages for cultural resources and to assess the significance of the resources. But while intensive inventory and assessment of cultural resources is mandated by law and NPS policy, as noted by Hobler and Hobler (1976), most of the inventories completed in Natural Bridges have been unsystematic, reconnaissance surveys biased towards the location and documentation of large, accessible ancestral Puebloan masonry structures.

So far, intensive archeological inventories have covered only 835 acres out of the total of 7636.49 acres in the monument. Based on data from Cedar Mesa and from intensive inventories recently completed in nearby Canyonlands National Park and Glen Canyon National Recreation Area, intensive inventory of the Monument would probably double the number of documented cultural resources and would dramatically increase the number of Archaic and Protohistoric sites, since these sites tend to be underrepresented in biased reconnaissance inventories. The high densities, varieties, and significance of cultural resources expected as a result of an intensive inventory would probably enable the entire Monument to be listed on the National Register of Historic Places as either an archeological district or a multiple property nomination could be

prepared. Placing the sites of Natural Bridges on the National Register of Historic Places would probably facilitate greater protection and preservation.

Data about the level and intensity of cultural resources inventory efforts are maintained by the NPS as the Cultural Sites Inventory or CSI. The CSI describes and documents the location of, significance of, threats to, and management requirements for the known cultural resources in the Monument. It includes maps showing the areas inventoried and the intensity of the inventory effort. The official CSI for the Monument is currently maintained by the Midwest Archeological Center. Copies of the inventory maps on USGS 7.5' topographical maps are maintained in the headquarters of the Southeast Utah Group and at the Monument visitor center and these records are updated as new sites are recorded.

2. CSI Site Records

There are 214 archeological site records from the Monument presently in the files of the headquarters of the Southeast Utah Group and the visitor center files at the Monument. Of these documented sites that are on file, 29 are considered eligible for listing on the National Register of Historic Places, 141 have not been evaluated for National Register significance, and 44 are considered not significant or ineligible for the National Register.

Clearly, there is an immediate need to revisit the 141 unevaluated sites and bring documentation and evaluation of these sites up to current standards. Only 73 of these site records are considered adequately recorded on current Intermountain Antiquities Section Site (IMACS) forms. Therefore, a critical cultural resource management priority is to improve documentation of known sites and to assess the significance and eligibility of the known sites (historic and prehistoric) within the Monument. This updated site information should be collected as part of an intensive, systematic cultural resource inventory of the unsurveyed portions of the Monument.

Of the documented sites within the Monument, 123 are above ground, prehistoric structural sites. Of the known structural sites, 12 are considered eligible for inclusion on the National Register of Historic Places, 88 have not been evaluated for the National Register, and 23 are considered ineligible for the Register. These

data are provided in the summary tables for sites (Table 8) and structures (Table 9).

Table 8. Summary Chart for Archeological Sites.

Elig ible Site s	Elig ible	Condi tion Good, Impac t	Condi tion Fair, Impac t Moder ate	Condi tion Poor, Impac tLow Sever e	Condi tion Destr oyed	Condi tion o r Impac t Unkno wn
Yes	29	13	11	0	0	5
No	44	0	1	40	2	1
Unkn own	141	6	7	0	0	128
Tot.	214	19	19	40	2	134

Table 9. Summary Chart for Archeological Structures.

Elig ible	Elig ible	Condi tion Good, Impac t	Condi tion Fair, Impac t Moder ate	Condi tion Poor, Impac tLow Sever e	Condi tion Destr oyed	Condi tion o r Impac t Unkno wn
Yes	12	7	3	0	0	2
No	23	0	0	22	0	1
Unkn own	88	5	5	0	0	78
Tot.	123	12	8	22	0	81

3. List of Classified Structures

The NPS defines the List of Classified Structures as an official inventory listing of structures that have historical, architectural, or engineering significance in which the NPS has or plans to acquire any legal interest. The LCS should include structures that meet the criteria of eligibility for the National Register of Historic Places, or are contributing elements of sites and districts that meet the National Register criteria. Also included are structures managed as cultural resources through NPS planning processes.

Within the Monument, the LCS is current for historic sites, and there is no need to update this particular document. The LCS includes a total of 27 historic sites. Only one of the LCS sites is eligible to the National Register and it is a listed property, as discussed below. The LCS documents lack scale plan maps, and in general are not as well documented as standard historic or archeological site records within the IMACS system. Therefore a management goal is to re-record the LCS sites on standardized IMACS site forms and improve the level and quality of documentation of the historic resources of the Monument, even though these resources have been determined ineligible to the Register by historians meeting the Secretary of the Interior standards.

4. National Register of Historic Places

Authorized by the National Historic Preservation Act of 1966 and administered by the NPS in WASO, the National Register of Historic Places is the official list of historic properties recognized by the Federal Government as especially worthy of preservation for national, state, or local significance. The NPS is required by law to inventory, assess, and nominate to the National Register properties of national, state, and local significance. Many of the sites within Natural Bridges should be listed on the National Register of Historic Places for their ability to yield important information about the past (Criterion D). With improved intensive level inventory data, a multiple resource nomination or a National Register District will probably be prepared for all prehistoric sites within the Monument boundaries.

At present, the only cultural resource within the Monument that is actually listed on the National Register of Historic Places is the

historic Owachomo Bridge Trail or Zekes Trail (LCS#-NABR-3). The Owachomo Bridge Trail is listed on the National Register for its significance in American history. It documents the rise of the conservation movement and the role of the NPS and Federal Government in promoting the growth of tourism in the Southwest and throughout the United States.

As stated in the National Register nomination, Zeke Johnson, custodian of the Monument, began construction of the trail about 1925 and work continued on the trail until 1935. The period of historic significance for the trail is 1925-1935, the period of construction and early use, although the trail was in use through 1965 as an access to Owachomo Bridge. The trail is 3-6 feet wide and approximately 0.25 miles long as it follows the natural contours of the sandstone from the rim to the bottom of Armstrong Canyon. It includes segments of rough-hewn log steps staked in place and filled with stones and earth, random and coursed fieldstone steps, and steps carved into the natural sandstone. Except for some erosion of the fill behind the wooden steps, the Trail retains a high degree of physical integrity.

In addition to this listed property, 29 of the documented sites are considered eligible to the register, 141 have not been evaluated, and 44 are considered ineligible, mostly due to poor preservation and lack of integrity.

5) National Register Cultural Context/Themes

The NPS defines cultural contexts as the framework within which the significance of a resource can be evaluated as it relates to an ethnographic, historic, or prehistoric theme, a particular geographic area, or a specific time period. Thematic frameworks are usually used when evaluating the National Register Criteria for Evaluation A, which is defined as properties that are associated with events that have made a significant contribution to history, or D, for properties that are capable of yielding information important in history or prehistory.

When the historic resource study for the Monument was prepared, Mehls and Mehls (1986) listed 10 historic resource themes for the Monument (Mehls and Mehls 1986). Based on these themes, Zeke's Trail was considered eligible to the Register since it was representative of the rise of the conservation movement in American history and because it retained integrity. Despite a recent update

in the thematic frameworks for the NPS (1994), the other historic resources in the Monument are still considered ineligible to the Register. These resources were determined ineligible using the other National Register criteria, namely, they were not particularly associated with events that made a significant contribution to the broad patterns of history; they were not associated with the lives of persons significant in our past; they did not embody the distinctive characteristics of a type, period, or method or construction, or represent the work of a master, and they were not capable of yielding important information about history based on current research designs. In addition, they were judged ineligible due to lack of integrity.

As for prehistoric properties, while the new thematic framework (1994) is designed to provide thematic significance for prehistoric resources, with the wealth of knowledge of the prehistory of the Monument, prehistoric and protohistoric sites, districts and multiple properties will be evaluated under Criterion D, not the thematic framework approach. Rather, archeological and ethnohistoric sites, districts and properties will be considered eligible for the Register if they have the capability of yielding important information about the past based on current and on-going research issues. Thus these sites will be evaluated under National Register Criterion D. Under this criterion it is likely that most sites within the Monument which retain integrity and which can be affiliated with a particular time period or cultural phase or occupation will be considered eligible to the Register.

C. Servicewide Baseline Databases and Reports of Cultural Resources

Servicewide baseline research reports and databases provide information that serve purposes from planning to interpretation. These reports are supposed to be completed before more specialized studies are undertaken. The status of each of the standard reports is listed below.

1. Archeological Overview and Assessment

An archeological overview and assessment has not been prepared for the Monument; however, formalized plans are in place from the Rocky Mountain Region (now Intermountain Field Area) for archeological overview priorities. It is supposed to describe and assess known

and potential archeological resources in the Monument. The overview should review, summarize, and evaluate all existing archeological data.

2. Archeological Identification/Evaluation Studies

These are studies that identify locations and characteristics of all or a sample of archeological resources in a particular area. Data on these resources are to be added to the CSI. In the Monument, a variety of small intensive inventories have been completed, as discussed in the section on inventories. Files and maps on these inventories are maintained in the Monument visitor center, the headquarters of the Southeast Utah Group, at the Midwest Archeological Center, and the Utah State Historic Preservation Office.

One of the most critical needs in managing the cultural resources of the Monument is for a complete, intensive archeological inventory and a synthetic report on the results of this inventory. This report would then provide the basis for a better interpretive program about the cultural resources of the Monument. An intensive inventory would also enable NPS to fulfill its legal mandates to evaluate cultural resources for the National Register of Historic Places. Without additional inventory and improved documentation of sites, the eligibility of sites to the register cannot be determined.

3. Ethnographic Overview and Assessment

An ethnographic overview and assessment has not been performed for the Monument. However, this is a basic report emphasizing the review and analysis of archival and documentary data on ethnographic resources and the groups who traditionally define such cultural and natural features as significant to their ethnic heritage and cultural viability. As discussed in the section on culture history and the Protohistoric period, this work is needed for the Monument since there are conflicting reports in the literature and the land claims commission reports on which groups were traditionally associated with the Monument. A completed ethnographic overview and a cultural affiliation study would serve as a scientific basis by which a consultation program could be designed and implemented.

4. Cultural Affiliation Study

This baseline ethnographic study has not been prepared for the Monument. These studies are designed to satisfy the need to identify cultural ties among past and present groups that occupied or used, and may still use, Monument resources. At the present time, no Native American traditional use or sacred or culturally significant sites are known within the Monument boundaries. However, the Bears Ears, outside Monument boundaries, are considered an important Navajo landmark. It is possible that sacred or significant traditional cultural use properties of the Navajo, Paiute, or Ute peoples may be present within Monument boundaries. A cultural affiliation study would provide a sound basis for determining traditional use and for guiding a formal consultation program.

Presently, without a formal study, consultation with potentially affiliated Native American tribes has been initiated and is ongoing for the Monument, especially in conjunction with the General Management Plan and the Native American Graves Protection and Repatriation Act.

5. Rapid Ethnographic Assessment Procedures

REAP procedures have not been initiated, despite the completion of the Monument's General Management Plan in 1996.

6. Historic Resource Study

An historic resource study was prepared for the Southeast Utah Group by Mehls and Mehls. It forms the basis for the LCS which was described above. As stated, only one historic resource in the Monument is considered significant, the Owachomo Bridge Trail or Zeke's Trail. All other historic sites were determined ineligible for the National Register of Historic Places.

7. Administrative and Legislative Histories

The Monument administrative archives are complete and a finding aid has been prepared. An administrative history and a legislative history could now be prepared efficiently if funding could be allocated to the projects.

8. Scope of Collection Statement

The SAC was completed in 1995. It is the basic curatorial planning document that will guide the Monument's acquisition and preservation of museum objects and archival collections.

9. Cultural Resources Management Bibliography

Cultural resource reports about the Monument are maintained at the Resource Management Office of the SEUG. While the 32 cultural resource reports about Natural Bridges that are on file have not been entered in the CRBIB system, the reports are listed in a computerized database file. Copies of the major cultural resource reports are currently on file in the Monument, although a more complete library of the management reports should be placed in the Natural Bridges' files, and general archeological literature would be a welcome addition to the library of the Monument. By making available more literature on archeology and cultural resources, interpreters at Natural Bridges would be better able to present up-to-date programs about the human history and prehistory of the Monument.

10. Historic Property Preservation Database

The HPPD is a computerized database of technical information on treatment of historic and prehistoric structures and landscapes. While the computerized version has not been prepared, full documentation of all stabilization and intervention in historic fabric of structures (prehistoric) in the Monument is maintained in the headquarters of the Southeast Utah Group.

D. Special Cultural Resources Studies and Plans, Including Museum Documents

1. Archeological and Ethnographic Collections Studies

Research into the collections has been limited. So far, a complete report on the in-house prehistoric ceramic collections has been prepared. Tree-ring samples have been analyzed (and stored) by the Tree-ring Laboratory in Tucson. Results of the tree-ring analyses have been presented in the Tree-ring Laboratories quadrangle series.

2. Archeological Data Recovery Studies

Data recovery as a means of mitigating adverse effects of development projects on significant historic properties in the Monument has been limited. The only recent mitigation project was completed by Alpine Archaeology of Montrose Colorado who performed data recovery on two sites impacted by repaving of the Loop Road in the Monument.

In general, the management strategy is to avoid significant cultural resources so data recovery is not necessary; however, certain sites are being heavily impacted by visitation. In particular, sites in and around the visitor center, entrance road, and campground are being heavily impacted by visitors collecting surface artifacts and trampling erosional channels through sites. A data recovery plan should be prepared for these sites and funding sought to mitigate the impacts through data recovery.

3. Collection Management Plan

A collection management plan has not been prepared. As a first step in preparing a Collection Management Plan, a meeting was held to determine specific collection and specimen needs of the various SEUG divisions (e.g. Interpretation, Natural and Cultural Resources Management). The conclusion was the main collection needs are for interpretation, and possible use of objects for permanent and temporary Visitor Center exhibits.

4. Collection Storage Plan

A formal collection storage plan was not written, but all in-house collections were recently moved to the new headquarters of the Southeast Utah Group in Moab. Additional collections that are stored at MWAC may well be moved to WACC in 1996. A full collection storage plan is needed.

Natural and cultural specimens from the Monument have been collected since the turn-of-the-century, but these collections, if they still exist, are scattered in repositories across the United States. Off-site repositories of collections from Natural Bridges are the Dan O'Laurie Museum in Moab, UT; the Western Archeological Conservation Center, Tucson, AZ; and the Mid-West Archeological Conservation Center, Lincoln, NB.

The Western Archeological Conservation Center or WACC and the Midwest Archeological Center or MWAC are both currently storing archeological objects and archival documents, as shown in Tables 10 and 11. San Juan College in New Mexico is storing 372 biological specimens and Northern Arizona University is storing 41 Quaternary resources. Additional repositories of museum specimens collected at Natural Bridges may well exist. These off-site collections need to be identified and brought together in a central, preferably local, federally-approved curatorial facility.

On-site collections include exhibit specimens in the Visitor Center at Natural Bridges National Monument and limited museum collections in the SEUG museum facility in Arches National Park. These SEUG collections include archeological specimens, historical objects including the original signs for the bridges, archival documents, biological specimens, and paleontological specimens.

Docum entat ion	Arche ology	Ethno logy	Histo ry	Archi ves	Biolo gy	Paleo ntolo gy	Geolo gy	Total
I n house Catal oged	428	0	33	9055	784	1	0	10301
WACC Catal oged	517	0	0	636	0	0	0	1153
MWAC Catal oged	0	0	0	2598	0	0	0	2598
Other Catal oged	0	0	0	0	445	41	0	486
I n house backl og	0	0	0	2000	13	0	0	2013

WACC	118	0	0	0	0	0	0	118
Backlog								
MWAC	6447	0	0	1000	0	0	0	7447
Backlog								
Other	0	0	0	0	252	25	0	277
Backlog								
Total	7510	0	33	15289	1494	67	0	24393

5. Collection Condition Survey

The collection condition survey has not been prepared, but based on rough estimates, Table 11 provides the estimated percent of collection by condition.

Table 11. Summary Chart for Objects, Percent of Collection by Condition and Location.

Type	Location	Excellent	Good	Fair	Poor	Unknown
Archaeology	SEUG	0	75	20	5	0
	MWAC/WACC	0	0	0	0	100
History	SEUG	0	80	20	0	0
Archives	SEUG	80	0	0	0	20
	MWAC/WACC	0	0	0	0	100
Biology	SEUG	0	80	10	0	10

ogy

	Other	0	60	20	0	20
Pale ontology	SEUG	0	100	0	0	0
	Other	0	10	0	0	90

6. National Catalog of Museum Objects and Collection Records

The computerized Automated National Catalog System is designed to list all cultural objects and natural history specimens that meet the criteria for museum objects in the NPS and the Monument's Scope of Collection Statement. Museum Catalog Records (Form 10-254) are required to be completed annually and filed in the SEUG museum storage area with copies to WASO.

Catalog records were backlogged until 1990 when a full-time seasonal curator was hired to reduce the backlog. The curator was able to input and update most pre-1986 catalog records using catalog backlog funding. The position was lapsed in 1994, so additional progress has not been made in completing accession records, loan forms, or maintaining current accession, loan, and catalog records from natural history researchers. While the previous curator was able to make considerable progress in reducing the pre-1986 catalog backlog for the Monument and the SEUG, current (post-1986) natural history researchers have generally not completed their catalog and accession records.

The collection management report is annually prepared and the counts of museum objects by discipline (i.e. archeology, ethnology, history, archives, biology, paleontology, geology) are updated based on the call from WASO. The current status is listed in the summary tables on objects.

Annual reports (Form 10-94, 10-349) on the museum collections were prepared by the SEUG archeologist from 1987-1990. From 1990 to 1994, a professional curator prepared these records. In the absence of catalog backlog soft funding, the curatorial position has been eliminated and the responsibility for these records has

been returned to the archeologist.

Accession and loan files need to be updated and reconciled. Many accessions have no documentation. Some loans have not been reviewed for many years. Many off-site collections are believed to exist, these need to be located and documented as loans or the materials need to be curated in a single repository.

7. Exhibit Plans and Exhibit Environment

Monument visitor center exhibits were originally designed and installed by Harpers Ferry in 1967. In 1990 the SEUG temporary curator monitored and inventoried the permanent exhibits and determined that some of the perishable prehistoric materials were inadequately and inappropriately mounted, and the Visitor Center environment had exceedingly high levels of ultraviolet light and excessive fluctuations in humidity.

Therefore, in FY91 perishable objects which would be affected by these adverse environmental conditions were removed from the exhibits. In 1992 an insect infestation led to the deaccessioning of many of the biological specimens on exhibit. Clearly, an Integrated Pest Management system is not in place. Housekeeping and disaster management plans have not been formulated.

A security survey was completed in FY92 for all of the Southeast Utah Group. The survey found inadequate security and fire suppression systems in place in both the visitor center and the collection storage area.

In FY95 funds were received for a new exhibit plan. The plan will emphasize nonperishable objects. The exhibits should be installed by the end of 1996 and new fire and security systems are being installed at the same time.

8. Cultural Landscape Report

Cultural landscapes are defined in NPS-28 as "...a geographic area, including both cultural and natural resources, including wildlife or domestic animals therein, that has been influenced by or reflects human activity or was the background for an event or person significant in human history." No formal cultural landscapes have been identified for Natural Bridges. Given the

historic record, no historic landscapes are expected to be identified. However, it is possible that ethnographic landscapes associated with contemporary groups might be identified. A program of consultation about traditional cultural properties and potential cultural landscapes is needed.

9. Historic Furnishings Report

There are no furnished historic structures in the Monument so this report is not needed.

10. Historic Structure Preservation Guides and Reports

The 11 prehistoric structures in the Monument which are most subject to visitor impacts have been stabilized and as part of the stabilization process, full reports were prepared that guided the stabilization work. These reports also guide on-going maintenance of the structures.

11. Social Impact Study

While Monument development and programs are not anticipated to involve any significant change in the lifeways or resources of any traditionally related people, a social impact study analyzing the economic value of the Monument in the local or regional community would prove helpful in community relationships. Specific social impact analyses are included with environmental assessments as needed.

12. Special History Study

Special history studies have not been prepared for the Monument, but a grazing history would be particularly useful in managing the vegetation and soils of the Monument.

13. Traditional Use Study

Since the Monument was set aside in 1908, traditional uses of its resources were discontinued at that time. While there appears to have been some limited Navajo procurement of pinyon nuts within the Monument boundaries since the Monument was established, other than this use, there is little evidence for any traditional uses of the Monument's cultural and natural resources by people who were

historically or prehistorically associated with those resources.

To help determine the extent to which traditional uses of Monument resources might have continued, ethnographic consultation requirements established in the 1988 NPS Management Policies are being reviewed and formal procedures are soon to be developed to insure that NPS and federal policies are met. These procedures and the consultation program will be developed with the aid of the System Support Office ethnographic personnel.

14. Visitor Use or Behavior Study

A Visitor Use Survey needs to be conducted at highly visited cultural sites throughout the Monument. Such a survey would identify the actual behaviors of visitors occurring at specific sites, with a focus on inappropriate and damaging behavior. After identifying both inappropriate behaviors and the subpopulations of visitors responsible for such behaviors, site specific management plans can be developed to prevent adverse impacts of visitors to sites. In addition, appropriate interpretive materials could be prepared to target the specific subpopulations of visitors who damage sites through lack of knowledge or information.

15. Oral Histories

Oral histories should be collected and transcribed and curated for people traditionally or historically associated with the Monument. Such histories would be particularly useful from former Monument staff with knowledge of prior decision-making processes. Such oral histories are addressed in the Scope of Collection Statement.

E. Condition of Cultural Resources

1. Sites and Structures

Nineteen of the documented sites in the Monument are in good to excellent condition. These sites are well-preserved due to several reasons: 1) backcountry use of Natural Bridges is limited and as a result, visitor impacts to sites are limited; 2) the existence of an on-going stabilization and monitoring program, as well as a site monitoring program funded in FY92 by the Archeological Resources Protection Act (ARPA). Sites stabilized, monitored and consistently maintained under these programs are listed in Table

12.

Table 12. Monitored and Stabilized Sites in Natural Bridges.

<u>Site #</u>	<u>Name or Location and Type</u>
42Sa6788	Perfect Granary
42Sa6801	Conical Ruin
42Sa6802	Kachina Bridge Ruin
42Sa6803	Defensive Wall
42Sa6804	Defensive Wall
42Sa6819	Horsecollar South
42Sa6820	Horsecollar North
42Sa6845	Loop Road Ruin
42Sa6965	Bare Ladder Ruin
42Sa6967	Lightning House
42Sa16751	Sipapu Bridge Trail Ruin
LCS	Owachomo Bridge or Zekes Trail

Another 29 sites are in fair condition, 40 are in poor condition, and two have been destroyed. However, due to inadequate documentation, the present condition of 134 sites is unknown.

2. Impacts to Sites and Structures

The monitoring program has established that adverse impacts to these sites are caused by both natural and human agents. Of the human impacts, graffiti is the most consistent impact that visitors have on the sites in the Monument.

Looting of surface artifacts and subsurface deposits is also a common impact on the sites in the Monument. While most of the serious looting of alcove and rockshelter sites in Natural Bridges appears to have been conducted in the past, looting of surface artifacts remains a consistent impact that visitors have on the sites of the Monument today. Within the last five years, most of the artifacts on the sites within the canyon bottoms have been looted as a form of souveniring behavior.

Cattle trespass in Natural Bridges has been a serious impact to archeological sites. Fragile archeological deposits have been destroyed by trespass cattle. Fencing the Monument will eliminate this particular impact agent. And, with the continuation of the

stabilization and monitoring program, as well as the Archeological Resources Protection ranger patrol program, sites should remain in good to excellent condition. The continuation of these programs will enable the NPS to continue to fulfill its legal mandate to preserve and protect the cultural resources of the Monument.

V. OVERVIEW OF NATURAL RESOURCE MANAGEMENT PROGRAM AND NEEDS

A. Major Program Activities

The SEUG Natural Resource Division's major program activities are as follows:

1. Threatened and Endangered Species

Currently the peregrine falcon (*Falco peregrinus*) is the only endangered species of wildlife at Natural Bridges National Monument. A breeding pair of peregrine falcons have nested successfully within the Monument since the 1993 breeding season. They fledged two young in 1993, two in 1994, and one in 1995. The location of the aerie has changed with each breeding season, but has remained within a discrete area. The Chief Ranger has been monitoring the falcons as time allows. The threatened Mexican spotted owl is known to occur in similar habitats near the Monument, but thus far searches have not revealed their presence here.

2. Exotic Plant Control

Exotic plants such as tamarisk, horehound mint, and musk thistle have invaded Natural Bridges. The extent of the spread has been minimized so far by Monument staff who have made a concerted effort to control these exotics through both mechanical and chemical means. In 1995, the Monument lost the ability to fund a seasonal (5 month) position dedicated to in-the-field resource management activities (which had included mapping and control of exotics, as well as peregrine monitoring, archeological site monitoring and patrol, and revegetation work).

During the 1995 summer season, the Chief Ranger was able to get out on a sporadic basis to cut large pockets of tamarisk in the upper reaches of several drainages, but most of the rest of the Monument was neglected. Systematic and consistent exotic plant control activities need to be on-going for this program to be successful. Current staffing levels at Natural Bridges do not allow for this!

3. Boundary Fencing

The Monument's south and east boundaries have effectively been fenced to prevent trespass cattle. Through an arrangement with the BLM and using the natural topography of the land, Monument staff were able to erect a .4 mile fence on BLM land adjacent to the Monument that effectively blocks cattle over an extensive area. Without this cooperative effort, a fence line of over 2 miles would have had to be constructed through rugged terrain at much additional expense and labor. This particular project, which was completed in the fall of 1995, used volunteer labor supplied by the Sierra Club to supplement Monument staff.

Additional fencing on the Monument's north boundary was begun in 1994, but because of logistics and lack of staff this project has not been completed. It will require two weeks of additional labor by a two-person crew to complete this segment.

The remaining west boundary is not fenced and does not need to be. The terrain is such that cattle cannot enter the Monument from that direction.

4. Revegetation

Following major road work in 1993 and 1994 as part of a Federal Lands Highway Project, extensive revegetation efforts have been ongoing in an attempt to promote a rapid recovery of native ground cover. Most of this effort has been focussed along the roadside where previous ground disturbances, the result of roadwork, have left bare soils. Native plants have been heeled in and native seed broadcast in an attempt to begin recovery.

Additional work has been done at pull-offs along Bridge View Drive and near bridge overlooks. The use of low-profile barrier fencing has been particularly successful in preventing trampling of revegetated areas by visitors. Constructed of native juniper posts and lodgepole rails, the fencing is attractive, low-cost, and effective. Its use along the Owachomo Bridge Trail has been responsible for the area's rapid recovery from trampling of cryptobiotic soils and subsequent loss of vegetation. Within a year of installation, noticeable recovery has occurred spontaneously.

Much still needs to be done. Additional revegetation work will proceed during the spring and summer of 1996 using remaining FLHP monies, however, funding to address an even greater problem in the campground is not available.

5. Oil and Gas Development

While lands within the Monument are withdrawn from mineral leasing, oil and gas leases exist on BLM lands within two or three miles of Natural Bridges' boundary (though none are currently in production), and there is increasing potential for oil and gas development within White Canyon. Oil and gas development is an external threat to the resources (clean air, night sky, solitude and wilderness) of Natural Bridges. To monitor this threat, the Natural Resource Specialist and Monument staff review and comment on oil and gas environmental assessments (EAs), review various planning documents from the Bureau of Land Management (BLM) and Utah Division of Oil, Gas and Mining; coordinate with NPS Mining and Minerals Branch; track local oil and gas activities; and review leasing sales for tracts adjacent to Natural Bridges.

The oil and gas monitoring program is expanding with expansion of the threat. Currently, oil and gas monitoring accounts for 15 percent of the Natural Resource Specialist's time. This need did not exist a year ago and will probably continue to be important for the near future. This function is likely to expand in the next year due to the backlog in planned drilling. Future demands on time will be dependent on the success of industry in exploiting this reserve.

6. NEPA Compliance

Natural Bridges' Chief Ranger and the SEUG Resource Management Division is routinely involved in the writing of Resource Management Plans (RMP's), environmental assessments (EA's), and other compliance documents. Small ground disturbing activities undertaken by the maintenance or other divisions are also monitored and NEPA compliance assured by Monument staff and the Natural Resource Management Specialist.

7. Geographic Information System (GIS)

In 1994, a GIS Specialist was hired by the SEUG to begin to bring

GIS capabilities to the Resources Management division serving all three NPS units. Natural Bridges is just beginning to make use of this technology.

8. Administration and Supervision

Approximately 300 hours per year are expended by the Natural Resource Specialist on administration and supervision of seasonal natural resource workers for the three NPS units that comprise the SEUG. The Chief Ranger at Natural Bridges estimates that he spends an additional 300 hours yearly on resource management planning and activities on-site. More time must be devoted to effectively manage the natural resources in the Monument.

9. Miscellaneous Natural Resource Functions

There are a number of programs which are important to the operation that account for a great deal of time cumulatively. These include Integrated Pest Management (IPM), spotted owls, reclamation inventory and planning, endangered species, raptors, and water quality. The Natural Resource Specialist handles IPM for all three parks. He is responsible for the annual reporting on the IPM program, submission of 10-21 A requests for pesticide use (eight per year), research into means of pest control (five per year) and coordination with various park personnel on the proper use and storage of pesticides. SEUG currently uses only Garlon 4, Round-up and Dipel 4L. Total time committed by the Natural Resource Specialist to IPM is 100 hours.

10. Improved Understanding of the Monument Ecosystem

The NPS needs to ensure comprehensive management of the Monument ecosystem. The "common" resources of the Monument such as coyotes, small mammals, birds, plant communities, soils, etc. are inadequately understood. Population dynamics are poorly known, and without additional information, these species and their role in the functioning of the Monument and regional ecosystem may well deteriorate with the increase in visitor pressure on the Monument.

One way management of the natural resources of the Monument can be improved, is by having a detailed, comprehensive soil map. The NPS needs to work closely with the U.S. Soil Conservation Service and Utah Agricultural Experiment Station to fulfill this need.

Periodic, low level fly-overs (such as on a ten year cycle) are necessary to obtain aerial photographs of the Monument. Aerial photographs obtained on such a cyclical basis, would enable the NPS to better manage resources within the Monument, and would enable the NPS to monitor external threats such as oil and gas development

B. Natural Resource Staffing

The Chief Ranger at Natural Bridges has programmatic responsibility for the Resource Management Program on-site in addition to his other program responsibilities. There are no other on-site staff committed to the Resource Management Program. Currently several natural resource management staff in the SEUG Natural Resource Management Branch assist the Monument. These natural resources positions available to the Monument are described below.

A full-time Natural Resource Specialist is based in the SEUG Resource Management division in Moab, Utah. His time is divided as follows: thirty percent to wildlife related issues such as Peregrine falcons, desert bighorn sheep and endangered species. Forty percent of his time is devoted to compliance issues, Resource Management Plans, and oil and gas monitoring. Thirty percent of his time is devoted to general resource management issues.

A full-time, subect-to-furlough botanist is available from the SEUG Resource Management office. This botanist has primary responsibility for the long-term monitoring program for vegetation. This program has been in operation for 10 years. The program is base-funded and each year from one to two seasonal biological aids or technicians have been hired, and in addition, using funds from the Canyonlands Natural History Association sales, one to two Student Conservation Association biological technicians have been hired to work on long-term monitoring.

A full-time planner is on staff. The planner has a natural resource background and his primary responsibility is ensuring NEPA compliance, and writing and preparing planning documents as needed by the units of the SEUG.

A full-time GIS Specialist is also on staff. This person has primary responsibility for mapping functions of the SEUG, and for development of GIS models and data layers.

Another natural resource position that was allocated to the SEUG Resource Management division was recently transferred to the National Biological Survey, now a part of the US Geological Survey. This position was a research grade biologist, with a primary emphasis on soil science and studying the effects of visitor trampling on desert soils. This position was also a component in the long-term monitoring program prior to conversion to the NBS.

For the last few years, soft funds have been available for a natural resource biological aid to perform weed and exotic control work during the summer season. The weed control position has been utilized to control tamarisk, Russian knapweed, and other exotics in the Monument.

Because of the competing workload as well as the logistics involved in trying to service an area 120 miles distant from the SEUG Resource Management office in Moab, Utah, it would be most efficient to fund a subject-to-furlough GS-09 resources management position at Natural Bridges to administer the program here. Currently, the Chief Ranger has that responsibility included with his Interpretation, Fee Collection, and Visitor Protection program areas. While this arrangement worked nicely ten years ago, it ill-serves the Monument's needs now when visitation is increasing 10-15% yearly and management must respond rapidly to meet the challenges that this growth represents to the proper care of the resource base. Having someone on-site who is intimately familiar with the resources of Natural Bridges and able to devote the time necessary offers advantages not presently available.

Until such time that this position can be secured, funding for a seasonal GS-05 field position is critical for the continuance of a viable resource management program at Natural Bridges.

VI. OVERVIEW OF CURRENT CULTURAL RESOURCE MANAGEMENT PROGRAM AND NEEDS

A. Major Program Elements

The Monument was established to preserve and protect cultural resources, and to allow the public to enjoy the accessible and spectacular ancestral Puebloan ruins; however, visitor access to cultural resources is usually antithetical to preservation and protection. Therefore, the primary management objective is to balance the conflicting goals of allowing the public to visit sites and enjoy their cultural heritage, while preserving, conserving, and protecting the resources. Based on the Secretary of the Interior's directives for federal archeology programs, on NPS policies, as well as other federal laws and policies, several components have been established in the cultural resource program. These components are described below.

1. Direct Physical Protection of Sites

A monitoring program is in place to record impacts to highly visited and significant sites in the Monument. Most monitoring is performed by Monument staff (when funding and time allow) who regularly patrol and monitor 11 previously stabilized sites while also monitoring other more remote sites on a sporadic basis. The permanent SEUG archeologist provides support and guidance while also performing any re-stabilization or intervention in historic fabric. The monitoring program allows informed management decisions to be made about which sites need stabilization, and which sites are being adversely impacted by what types of visitor behaviors. Site specific management strategies can then be devised to reduce these impacts.

For instance, to help reduce the impacts of visitors on sites, a variety of interpretive materials are available at the visitor center. Sales items of books, postcards, videos, etc. help inform visitors and reduce souveniring of artifacts from sites in the Monument. A brochure about cultural resources is given out in the visitor center. This helps reduce inadvertent damage by well-intentioned, but poorly informed visitors.

At the most visited site in the Monument, Kachina Bridge Ruin, a register box has been installed to inform visitors and reduce graffiti. In addition, a low fence was erected in 1995 around the fragile structures on the site. This barrier helps direct visitor traffic and preserve the structures.

To help reduce visitor damage to other highly visited sites, registration boxes containing site-specific information that informs visitors about "their find" and enlists their support in the site preservation have been installed on site. These boxes also contain notebooks where visitors are encouraged to write their names and comments. These books help reduce graffiti on the sites, and by creating a management presence, they appear to help improve visitor etiquette as well.

While some of these direct physical protection strategies seem to be improving preservation and protection of sites, more information is needed. Specific management plans are needed for highly visited and fragile sites. For example, delineated paths could be established to control where people go in visiting particularly fragile sites. At certain sites, signs, barricades, and register boxes need to be developed, and site brochures written about the sites to prevent vandalism and to improve public knowledge of cultural resources. More information on visitor behavior is needed.

Since only 11-12 sites are consistently monitored, any additional sites that could be monitored or stabilized would benefit park visitors and the resource. Current Monument and Resource Management staffing does not allow for this. A major need is to base fund a seasonal GS-05 archeological technician to ensure that Monument site monitoring is continued and to ensure more consistent efforts at reducing the growing visitor impacts on Monument cultural resources.

2. Site Indirect Protection

Many of the archeological sites within Natural Bridges have a long history of tourist use; in fact, Natural Bridges was set aside as a monument so the public could access the many ancestral Puebloan sites in White and Armstrong canyons. Sites which have been historically highly visited and which have an intensive level of management are promoted as visitor destinations as part of a formal

site disclosure policy. This policy was established as a means of complying with the National Historic Preservation Act and Archeological Resources Protection Act which state that federal agencies may only disclose to the public the locations and character of sites when the disclosure of such information will not result in harm or damage to the sites. Based on this policy which is articulated as a superintendent's directive, the highly publicized and highly visited sites which the Monument can protect from visitor damage are labelled "Class I" sites. Class I sites receive the greatest management intervention in terms of stabilization, monitoring, maintenance, ranger patrols, and installation of direct physical protection devices such as barriers, register boxes, signs, etc.

"Class II sites" are defined as sites whose location will be revealed to the public if they request information about the site by name. These sites, like Class I sites, generally have some form of management presence on them like a register box, or they are consistently patrolled and monitored. Thus a high level of protection is offered to these sites.

Class III sites are defined as sites whose location is withheld from the public to ensure preservation and protection. Class III sites are unstabilized, receive less direct management efforts, and generally they are not patrolled as frequently as the Class I and II sites where visitor impacts are more frequent.

The site disclosure management policy is a form of indirect protection that entails specific actions on the part of the NPS. Since the Class I sites receive greater visitor impacts, it is necessary to direct more managerial resources to these sites for fencing, paths, interpretation, signs, ranger patrols, etc. At the same time, Class II and III sites, though not as highly impacted by visitors, must still receive a share of the resource management budget for stabilization, monitoring, ranger patrols, etc. Over time the site disclosure policy is evaluated and the class of each site is reviewed based on funding available to ensure preservation and protection. For instance, when the monitoring program indicates that visitor impacts are rising at a Class III site, the site may be reclassified as a Class II or I site if managerial resources such as ranger patrols, register boxes, etc., can be installed to ensure protection of the resource. With dwindling funds for cultural resource preservation work, it should be noted

that the numbers of sites on the Class I and Class II list are expected to decrease.

3. National Historic Preservation Act (NHPA) and National Environmental Policy Act (NEPA) Compliance

In compliance with section 106 of the National Historic Preservation Act, when ground disturbing undertakings are planned, the areas of potential effect are inventoried for cultural resources and the appropriate reports and documentation is submitted for consultation with the State Historic Preservation Officer, the Advisory Council on Historic Preservation, and interested parties. Major compliance work for FY96 involves undertakings associated with the General Management Plan and the addition of permanent housing at the Monument. Additional compliance inventories and report writing are conducted as needed.

4. Collection Management

The area of greatest program weakness in the cultural resource program is collection management. When combined with the other units of the Southeast Utah Group, the Monument has one of the largest collections in the Intermountain Field Area but no funding is available to handle collection accountability aside from a fractional share of the GS11 archeologist's salary and overhead on the museum storage facility and exhibits.

As described above, the archeologist is responsible for the writing of annual reports for WASO and the Colorado Plateau Cluster of the Intermountain Field Area including the annual random and controlled inventory report, curatorial work plan, collection management report, catalog record submission, collection backlog report, museum preservation and protection program fund request. The archeologist maintains loans, updates the Scope of Collection Statement, and ensures accountability for museum objects and collections on an on-going basis. Since this is a collateral duty which has taken approximately one third of the archeologist's time, the single greatest need in the cultural program is to base fund a permanent, professional museum curator position.

5. Museum Preservation and Protection

The archeologist monitors the museum storage facility for effects

of light, temperature, humidity, pests, etc. Electronic data loggers provided by the Intermountain Field Area have facilitated this effort by reducing the time needed to run paper-based hygrothermographs.

Housekeeping of the museum storage area is performed as needed. Each year the archeologist and chief ranger inventory the exhibits in the Monument visitor center and monitor the exhibits for any environmental problems, especially insect infestations. The Monument staff and archeologist have been working to bring the security and environment of both the museum storage facility and Monument visitor center exhibits up to NPS and American Association of Museums standards. This effort has been guided by a visitor center security survey that was conducted by Steve Layne and funded by the Rocky Mountain Region.

Once the security problems are resolved (target date end of FY96), the next greatest problem with the Monument exhibit environment is insect infestation. An Integrated Pest Management (IPM) system has not been implemented. Pests have been and continue to be a problem in both the storage facilities and in visitor center exhibits. For example, in 1990 numerous bird and mammal skins in the collections were deaccessioned and discarded due to insect damage. In 1992, biological specimens in the visitor center exhibit area had to be discarded due to insect infestation. An Integrated Pest Management (IPM) plan needs to be written and implemented.

6. Native American Graves Repatriation Act Compliance

The inventory and summary lists of human remains and associated grave goods and etc. were submitted on time to potentially affiliated and interested tribes as mandated by NAGRPA. Consultation and compliance with other provisions of the act are in process. No funding has been set aside if consultation visits by tribes or travel or other expenses are required.

7. Native American Religious Freedom Act Compliance

In compliance with the Native American Religious Freedom Act, the superintendent must consult with Native American religious leaders to develop and implement policies and procedures that will aid in determining how to protect and preserve Native American cultural and spiritual traditions. The superintendent has consulted with

various Native American groups in the development of the General Management Plan.

An active consultation program is just beginning. As discussed in previous sections, since the Monument was set aside at the turn-of-the-century, there is little traditional use of Monument resources. Nevertheless, local Native Americans (Southern Ute, White Mesa Ute, Paiute, and Navajo) will be consulted concerning potential traditional cultural properties within the Monument and other issues. The greatest obstacle towards such consultation is lack of funding for travel and related expenses to conduct on-site consultation.

8. Public Education

As mandated by the Archeological Resources Protection Act, permanent and temporary cultural resource personnel must work to foster awareness and appreciation of both historic and prehistoric cultural resources and to educate the public about the importance of protecting and preserving those resources. This is accomplished through a variety of programs including teaching classes at public schools, giving guided walks, outreach through local museums, educating commercial guides, sponsoring annual Utah Heritage Week activities, bringing speakers, craft demonstrators, and exhibits to local museums and communities, etc. Interpretive exhibits about archeology and history are an integral part of the new exhibits slated for installation at Natural Bridges visitor center in FY96 and these should improve public knowledge of the resources of the Monument and ways to minimize visitor impacts on those resources.

9. Interagency Cooperation and Information Exchange

As mandated by the Archeological Resources Protection Act, the archeologist frequently meets with BLM and USFS cultural resource professionals to resolve joint management problems. The archeologist attends the biannual Utah Professional Archeology Council meetings, and the archeologist generally attends the annual Pecos Conference for Southwestern archeologists.

10. Site and Object Documentation

Site records, base maps, inventory records, etc. were described above. A major responsibility of the cultural resource management

program is ensuring that these records are updated consistently and accurately.

B. Cultural Resource Staffing and Funding

Presently, the only permanent cultural resource staff member is a GS-11 archeologist based in Moab, Utah. This person shares responsibility with the chief ranger for the cultural resource management program of Natural Bridges. This position is base-funded from the SEUG Resource Management division. The base funds also provide one four-wheel drive vehicle for the archeologist. Additional program support from the SEUG Resource Management division has been inconsistent.

Cultural Cyclical funds have been used for site monitoring and stabilization since the mid-1980s, but in the newly reorganized Colorado Plateau Cluster of the Intermountain Field Area, continued funding for monitoring programs will probably be discontinued. Other ways to continue the cultural resources programs need to be explored.

Catalog backlog funds were used to hire a full-time curator and a half-time archivist to catalog all backlogged collections made prior to 1986 and to complete the administrative archives of the Monument and SEUG. Work has also been initiated on a photographic archive for the Monument. However, in the absence of catalog backlog or cultural cyclical soft money, the archivist and curatorial positions have been lapsed and all curatorial duties have been transferred to the archeologist. The curatorial workload has been rising due to increases in research and collections of natural history specimens within the Monument and the SEUG.

From FY92 to FY94, a temporary seasonal patrol ranger was hired with Archeological Resources Protection Act funding and a portion of the Cultural Cyclical Monitoring and Stabilization program funds. This Monument-based person patrolled highly visited and highly vulnerable sites at Natural Bridges. The goal of the program was to prevent looting, vandalism, and inadvertent damage to the cultural resources of the Monument through visitor contacts and education. Although Monument staff and the monitoring program data indicated the program was successful in meeting its goal, ARPA funding will probably be unavailable during FY96. The patrol ranger function will be supported in FY96 through the Monitoring

and Maintenance Cultural Cyclical program, but most on-site patrol will be done by Monument staff as an unfunded activity in addition to their other duties. Without soft funding, the future of this patrol function is unclear.

In summary, the greatest unmet personnel needs are in two broad areas: collections management and site physical protection. Two main positions are needed: a permanent, professional museum curator and a seasonal archeologist. These needs are described below.

The need for a permanent, professional curator is critical. Catalog backlog and cultural cyclical funds were used to hire both a temporary half-time archivist and a full-time curator. These professionals were able to reduce the catalog backlog, correct gross errors in the catalog records, update the museum accountability program, improve the physical environment of the collection storage areas and exhibits, and complete the finding aids for administrative archives of the SEUG. However, the curatorial position funding was lost in FY94 and the archivist position was lost at the end of FY95. Without the soft funding and the personnel, the archeologist assumed responsibility for the collections and curation. With the progress made in reducing catalog backlog, the workload averages 10 hours per week, but the workload is growing as the number of collections increases. A permanent museum curator is needed to bring the collections up to standards, reduce the catalog and accountability backlog, maintain accountability, search for off-site collections, monitor the museum and exhibit environments and correct any environmental deficiencies, etc.

Likewise, the need for a seasonal archeologist to monitor and maintain sites is critical. People visit Natural Bridges to see ancestral Puebloan structural sites, but visitation damages sites. To continue to allow visitors access to sites, the Rocky Mountain Regional Office contracted to stabilize some of the more popular sites in the Monument in the mid-1980s. To protect this fiscal investment in stabilized sites, and to continue to allow visitors access to the sites, Cultural Cyclical funds were used to monitor the stabilized and highly visited sites, and to provide management information about the impacts occurring and to devise ways to reduce those impacts. The funding was used different ways in different years: sometimes a seasonal archeologist (GS07) was

hired to perform the work. Other years untrained seasonal rangers were hired to contact visitors and educate them about minimum impact visitation techniques. During FY96, a commissioned law enforcement ranger trained in ARPA enforcement will be used to perform the monitoring at all three park areas of the SEUG. However, the current Cultural Cyclical Funding Priority Committee for the Intermountain Field Area has determined that cyclical funds should not be used for such routine, annual programs as monitoring and maintenance. Hence, a critical need is to base fund either a seasonal archeologist trained in Southwestern archeology to visit at least the Monument's 11 routinely monitored sites in the spring and fall, and to maintain the sites, or to hire a trained ARPA law enforcement ranger with an interest in public outreach and education to perform the monitoring and maintenance. Either position could maintain sites and prevent visitor damage. To continue to allow visitors access to the nonrenewable cultural resources of the Monument, the SEUG needs to base fund either a seasonal archeologist position or a trained ARPA enforcement ranger who could help the permanent archeologist maintain, stabilize, and monitor these sites.

VII. REFERENCES CITED

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VIII. PROJECT STATEMENTS AND APPENDICES

Active Filter: (No filter)

Output Selections:

Sorted by: Resource Type + Priority + Project Number + Park + Initial Proposal
Years: All years
Show subtotal after change in Resource Type
Show grand total

03/08/96
16:24:51

PROJECT LIST

PRIORITY	PROJECT NUMBER	PROJECT TITLE	SUB-TITL
1	NABR-C-003.000	CULTURAL RESOURCE INVENTORY, EVALUATION	
2	NABR-C-001.000	COLLECTIONS MANAGEMENT	
3	NABR-C-009.000	SITE MONITORING AND MAINTENANCE	
4	NABR-C-010.000	ARPA SITE PATROLS, STAFF TRAINING	
5	NABR-C-012.000	SITE PROTECTION	
6	NABR-C-011.000	INTERPRETATION OF CULTURAL RESOURCES	
7	NABR-C-008.000	COMPLIANCE	
8	NABR-C-006.000	ETHNOGRAPHIC PROGRAM	
9	NABR-C-007.000	CULTURAL SITE INVENTORY	
10	NABR-C-014.000	NAGPRA COMPLIANCE	
11	NABR-C-002.000	MAINTAIN AND MONITOR EXHIBITS	
12	NABR-C-013.000	DATA RECOVERY OF SITE 42SA18637	
13	NABR-C-004.000	ROCK ART DOCUMENTATION	
14	NABR-C-005.000	ARCHIVES, ADMIN., LEGISLATIVE HISTORIES	
Resource Type Sub-total-----			
1	NABR-I-002.000	INTEGRATED PEST MGMT AND PROGRAMING	
2	NABR-I-001.000	GEOGRAPHIC INFORMATION SYSTEM DEVELOPMENT	
Resource Type Sub-total-----			
1	NABR-N-013.000	VEGETATION MNGT PROGRAM (FENCING, REVEG)	
2	NABR-N-008.000	INVENTORY AND MONITORING PROGRAM MANAGEMENT	
3	NABR-N-007.000	SURFACE WATER RESOURCE MANAGEMENT	
4	NABR-N-011.000	WILDLIFE RESOURCES MANAGEMENT	
5	NABR-N-009.000	INVERTEBRATES AND SOIL MICROFLORA STUDY	
6	NABR-N-003.000	WATER SYSTEM MANAGEMENT	
7	NABR-N-014.000	QUATERNARY RESOURCES	
8	NABR-N-004.000	REMOTE SENSING NEEDS	
9	NABR-N-012.000	THREATENED, ENDANGERED AND SENSITIVE SPECIES	
10	NABR-N-010.000	CYANOBACTERIAL-LICHENMOSS SOIL CRUSTS	
11	NABR-N-005.000	HAZARDOUS MATERIALS SPILL RESPONSE PLAN	
12	NABR-N-002.000	EXTERNAL ISSUES OIL AND GAS DEVELOPMENT	
13	NABR-N-001.000	EXTERNAL ISSUES MONITORING AND ASSESSMENT	
14	NABR-N-006.000	AIR RESOURCES PROGRAM MANAGEMENT	
Resource Type Sub-total-----			
Grand Total=====			

30 projects printed

Active Filter: (No filter)

Output Selections:

Sorted by: Resource Type + Project Number + Priority + Park + Initial Proposal
Years: All years
Show subtotal after change in Resource Type
Show grand total

03/08/96

16:21:55

PROJECT LIST

PRIORITY	PROJECT NUMBER	PROJECT TITLE	SUB-TITLE
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2	NABR-C-001.000	COLLECTIONS MANAGEMENT	
11	NABR-C-002.000	MAINTAIN AND MONITOR EXHIBITS	
1	NABR-C-003.000	CULTURAL RESOURCE INVENTORY, EVALUATION	
13	NABR-C-004.000	ROCK ART DOCUMENTATION	
14	NABR-C-005.000	ARCHIVES, ADMIN., LEGISLATIVE HISTORIES	
8	NABR-C-006.000	ETHNOGRAPHIC PROGRAM	
9	NABR-C-007.000	CULTURAL SITE INVENTORY	
7	NABR-C-008.000	COMPLIANCE	
3	NABR-C-009.000	SITE MONITORING AND MAINTENANCE	
4	NABR-C-010.000	ARPA SITE PATROLS, STAFF TRAINING	
6	NABR-C-011.000	INTERPRETATION OF CULTURAL RESOURCES	
5	NABR-C-012.000	SITE PROTECTION	
12	NABR-C-013.000	DATA RECOVERY OF SITE 42SA18637	
10	NABR-C-014.000	NAGPRA COMPLIANCE	

Resource Type Sub-total-----

2	NABR-I-001.000	GEOGRAPHIC INFORMATION SYSTEM DEVELOPMENT	
1	NABR-I-002.000	INTEGRATED PEST MGMT AND PROGRAMING	

Resource Type Sub-total-----

13	NABR-N-001.000	EXTERNAL ISSUES MONITORING AND ASSESSMENT	
12	NABR-N-002.000	EXTERNAL ISSUES OIL AND GAS DEVELOPMENT	
6	NABR-N-003.000	WATER SYSTEM MANAGEMENT	
8	NABR-N-004.000	REMOTE SENSING NEEDS	
11	NABR-N-005.000	HAZARDOUS MATERIALS SPILL RESPONSE PLAN	
14	NABR-N-006.000	AIR RESOURCES PROGRAM MANAGEMENT	
3	NABR-N-007.000	SURFACE WATER RESOURCE MANAGEMENT	
2	NABR-N-008.000	INVENTORY AND MONITORING PROGRAM MANAGEMENT	
5	NABR-N-009.000	INVERTEBRATES AND SOIL MICROFLORA STUDY	
10	NABR-N-010.000	CYANOBACTERIAL-LICHENMOSS SOIL CRUSTS	
4	NABR-N-011.000	WILDLIFE RESOURCES MANAGEMENT	
9	NABR-N-012.000	THREATENED, ENDANGERED AND SENSITIVE SPECIES	
1	NABR-N-013.000	VEGETATION MNGT PROGRAM (FENCING, REVEG)	
7	NABR-N-014.000	QUATERNARY RESOURCES	

Resource Type Sub-total-----

Grand Total=====

30 projects printed

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-001.000
Priority: 2
Page Num: 0001

Title : COLLECTIONS MANAGEMENT

Funding Status: Funded: 0.00 Unfunded: 20.00

Servicewide Issues : C24 (LANDSCAPE)
C46 (ACCOUNTBLY)

Cultural Resource Type: OBJC (Object)

N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Collection management is a problem for the SEUG due to the lack of a professional curator on the staff. Collection management is a collateral duty of the archeologist and with increasing research and collection of natural and cultural specimens, the work load maintaining accountability for the collection is growing.

Description of Recommended Project or Activity

The museum curator position needs to be funded for a half-time, permanent, professional position. The position must be funded out of park base funds to ensure the continuation of the accessioning, cataloging, housekeeping, environmental upgrading, etc., programs that were initiated using Catalog Backlog and Cultural Cyclical funds. Aside from standard collection management and museum preservation and protection tasks, additional work for a permanent curator would be tracking off-site collections, maintaining the administrative archives of the Monument, and attempting to bring all collections into a single, on-site repository.

BUDGET AND FTEs:

-----FUNDED-----				
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
			=====	
Total:			0.00	0.00
-----UNFUNDED-----				
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	RES	Recurring	20.00	0.50

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-001.000
Priority: 2
Page Num: 0002

Total: =====
20.00 0.50

(Optional) Alternative Actions/Solutions and Impacts

The preferred alternative is to fund a permanent curator position and to fund continued improvements in the actual storage facility and exhibits. Climate controls, security, IPM, and other NPS requirements for a federal repository need to be upgraded or installed for both exhibits in the visitor center and the storage facility.

Additional needs to collection management are described in the NPS Museum Handbook and NPS-28. With a curator on the staff, the Monument would improve accountability and improve its management of museum specimens. A Collection Management Plan could be contracted out to a professional curator, the Scope of Collection Statement which was finished in 1996 would be maintained and updated as needed, all objects would be accessioned, cataloged, stored, and maintained as required by the NPS Museum Handbook, archival and manuscript collections would be surveyed, appraised, accessioned, cataloged, rehoused, arranged, and described. While the archaeologist currently conducts the annual inventory of objects, a professional curator would perform the job more thoroughly and would be better able to track down off-site collections and researchers who have taken objects from the Monument. The Collection Management Report would be prepared on time, and the numbers would be far more accurate if a curator was on staff.

One of the greatest needs is to fund an investigation into the location of the collections taken from the Monument since the turn-of-the-century. Collections are known to be housed in repositories across the country. These repositories should be contacted and the collections should be examined. If possible, the collections should be brought together in one or possibly two repositories that meet NPS-28 and Museum Handbook standards.

Compliance codes : OTHER ()

Explanation: 516 DM2 APP. 2, 1.6

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-002.000
Priority: 11
Page Num: 0001

Title : MAINTAIN AND MONITOR EXHIBITS

Funding Status: Funded: 0.00 Unfunded: 7.00

Servicewide Issues : C45 (HOUSKP PLN)
C39 (HERTAGE ED)
Cultural Resource Type: OBJC (Object)
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Visitor Center exhibits are slated for installation in May of 1996 in the Natural Bridges' Visitor Center. These exhibits will need to be routinely maintained, inspected, and monitored to meet NPS-28 and Museum Handbook standards and to meet the needs of the Interpretive Plan for the Monument. Security and fire suppression systems will be installed at the time of exhibit installation, but these will also need to be maintained and monitored, particularly in the first year when false alarms will be common.

Description of Recommended Project or Activity

Houskeeping, security, intrusion alarm systems, and fire suppression systems in the Visitor Center exhibit area all need regular maintenance. An IPM system needs to be formulated and other aspects of the proper care of museum exhibits needs to be planned, initiated, and maintained. This requires funding to allow Monument staff to maintain or implement these systems.

BUDGET AND FTEs:

-----FUNDED-----				
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
Total:			0.00	0.00
-----UNFUNDED-----				
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	PRO	Recurring	1.00	0.10
Year 2:	PRO	Recurring	2.00	0.20
Year 3:	PRO	Recurring	2.00	0.20

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-002.000
Priority: 11
Page Num: 0002

Year 4:	PRO	Recurring	2.00	0.20
		Total:	=====	=====
			7.00	0.70

(Optional) Alternative Actions/Solutions and Impacts

The preferred alternative calls for funding for routine, cyclical maintenance of the exhibit cases (inside and outside the cases), and working closely with Harpers Ferry or their subcontractor to assure design elements that will allow easy access and maintenance so the exhibits will result in improved visitor education and interpretation.

In addition, action should be taken to ensure adequate fire suppression and intrusion systems are in place. All staff members should be trained in a support role, they must have the ability to hook up hoses to hydrants and place water on the building exteriors while awaiting the arrival of trained fire units. Additional training should take place utilizing existing fire extinguishers on a live, controlled fire. Because of the low number of staff members, ALL staff should participate in this regular fire suppression training.

In addition, all staff should practice emergency evacuations of the Visitor Center. This training should occur annually or seasonally as staff change.

Compliance codes : ARPA (ARCH. RES. PROT. ACT.)
OTHER ()

Explanation: 516 dm6 app. 7.4 b(3)

Project Statement

NABR-C-003.000

Last Update: 03/07/96

Priority: 1

Initial Proposal: 1996

Page Num: 0001

Title : CULTURAL RESOURCE INVENTORY, EVALUATION

Funding Status: Funded: 0.00 Unfunded: 492.00

Servicewide Issues : C02 (ID & EVAL)

C10 (INVENTORY)

Cultural Resource Type: SITE (Archeological Site)

N-RMAP Program codes :

10-238 Package Number :

Problem Statement

While NPS has a mandated responsibility to inventory, document and assess the significance of cultural resources on all lands it manages, the responsibility is even greater at Natural Bridges since it was set aside to assure preservation, protection, and public access to its cultural resources. This is clearly stated in both President Taft's Proclamation No. 881 and President Kennedy's Proclamation No. 3486.

However, only limited acres of the total acres in the Monument have been intensively and systematically inventoried for cultural resources. Because of this lack of inventory, knowledge of the cultural resources of the Monument is biased towards the large ancestral Puebloan structures. Very little is known about earlier or later occupations of the Monument. With a completed inventory, or at least a sample survey of the cultural resources, the Monument could be listed on the National Register of Historic Places as an archaeological district. This should increase protection of the cultural resources of the Monument and partly allow NPS to fulfill its mandated responsibilities for cultural resources.

Description of Recommended Project or Activity

NPS should fund a complete, intensive, and systematic cultural resources survey of Natural Bridges National Monument to comply with Executive Order 11593. The survey should conform to NPS-28 standards, as well as with guidelines of the Secretary of the Interior and the Advisory Council on Historic Preservation. Specifically, the survey should be conducted after development of a research design which would enable the sites that will be recorded to be assessed for National Register significance. Site locations should be precisely and accurately plotted, and it is recommended that site locations be recorded using GPS technology. Use of GPS, in conjunction with the availability of new (provisional) 7.5' USGS topographic maps for the Monument should enable new field records to be correlated with existing site

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-003.000
Priority: 1
Page Num: 0002

records. (One of the main problems managing cultural resources in the monument is the relocation of sites recorded prior to the availability of USGS 7.5' topographic maps.)

With the logistical difficulties working in NABR, only about 20 acres could be inventoried per person day. Therefore, the inventory would take about 182 person days. Based on survey records for Cedar Mesa, site density can be expected to range from 0.05 sites per acre in lowland areas to 0.24 sites/acre in uplands. Therefore, the number of sites to be recorded would range between 177 to 883. With 230 known sites and with most of NABR in uplands, the site density is probably closer to the higher figure. Since recording a complex site takes at least a person day, if there were 800 sites to be recorded, field recordation time would take another 800 person days. This makes the field time 982 person days. Site form preparation and report writing takes at least the same amount of time as the field work, for another 982 days. This means the inventory and evaluation project would take at least 1964 person days. If we assumed a cost of \$250 per person day, the project would cost an estimated \$491,000.

BUDGET AND FTEs:

-----FUNDED-----				
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
Total:			0.00	0.00
-----UNFUNDED-----				
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	RES	?	123.00	3.00
Year 2:	RES	?	123.00	3.00
Year 3:	RES	?	123.00	1.00
Year 4:	RES	?	123.00	1.00
Total:			492.00	8.00

(Optional) Alternative Actions/Solutions and Impacts

1. No Action. If a survey is not completed then NPS is not fulfilling its mandated responsibilities to inventory and assess cultural resources on lands it manages.
2. Preferred Alternative. If a complete, 100% intensive

Project Statement

NABR-C-003.000

Last Update: 03/07/96

Priority: 1

Initial Proposal: 1996

Page Num: 0003

inventory or even a sample survey is completed, then the NPS will fulfill its legal obligations to locate and evaluate significant cultural resources on the lands it manages. A completed survey will enable the NPS to fulfill its obligations to preserve, protect, and interpret cultural resources.

Compliance codes : ARPA (ARCH. RES. PROT. ACT.)
NHPA ((106) NAT. HIST. PRES.)

Explanation:

Project Statement
Last Update: 03/07/96
Initial Proposal: 1996

NABR-C-004.000
Priority: 13
Page Num: 0001

Title : ROCK ART DOCUMENTATION

Funding Status: Funded: 0.00 Unfunded: 45.00

Servicewide Issues : C02 (ID & EVAL)
C71 (VISIT IMPCT)
Cultural Resource Type: SITE (Archeological Site)
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Natural Bridges National Monument has extensive rock art mostly dating from the Anasazi Pueblo II/Pueblo III period. This rock art has the potential to attract great numbers of visitors and to be adversely impacted by visitor behavior. As visitation increases, so does destruction of rock art resources. While improved documentation of rock art will occur in conjunction with the full, intensive, systematic survey of cultural resources of the Monument, special rock art documentation should be prepared to help in future conservation work in the event of vandalism, or to provide the only permanent record of the art in the event there is complete obliteration.

Description of Recommended Project or Activity

To fulfill its mandated responsibilities of preserving and protecting cultural resources of Natural Bridges National Monument, rock art sites throughout the Monument should be documented and evaluated for their eligibility to the National Register of Historic Places. In addition to the standard documentation and evaluation for the Register, rock art must be documented for conservation. Photogrammetry is the best technique to provide complete documentation of rock art sites at risk of deterioration or destruction.

Once the documentation work is finished, monitoring and placement of interpretive signs at the more accessible rock art panels should be undertaken (see Site Physical Protection Statement).

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-004.000
Priority: 13
Page Num: 0002

BUDGET AND FTEs:

-----FUNDED-----				
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
			=====	=====
Total:			0.00	0.00
-----UNFUNDED-----				
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	MON	?	15.00	0.20
Year 2:	MON	?	15.00	0.20
Year 3:	MON	?	15.00	0.20
Total:			=====	=====
			45.00	0.60

(Optional) Alternative Actions/Solutions and Impacts

1. No Action. Under this alternative, the rock art resources of the Monument will continue to be undocumented. The rock art will continue to be vandalized and erode. No physical protection devices for rock art sites would be installed.

2. The preferred alternative is to photodocument rock art of the Monument in conjunction with an intensive survey and evaluation of cultural resources. In addition, rock art sites that are likely to be vandalized or impacted by visitors need special, intensive documentation in preparation for needed conservation work. Photogrammetry is probably the best documentation method; however, it is expensive and would need to be contracted out to specialized firms. Photodocumentation using a 35 mm camera (black and white prints, plus color slides) is less expensive and can be completed by park staff. At a minimum, 35 mm photodocumentation is necessary.

Compliance codes : ARPA (ARCH. RES. PROT. ACT.)
NHPA ((106) NAT. HIST. PRES.)

Explanation:

Project Statement
Last Update: 03/07/96
Initial Proposal: 1996

NABR-C-005.000
Priority: 14
Page Num: 0001

Title : ARCHIVES, ADMIN., LEGISLATIVE HISTORIES

Funding Status: Funded: 0.00 Unfunded: 30.00

Servicewide Issues : C37 (ADMIN HIS)
C38 (SPEC STUDY)

Cultural Resource Type: OBJC (Object)

N-RMAP Program codes :

10-238 Package Number :

Problem Statement

NPS is required to prepare administrative and legislative histories, but neither have been prepared for Natural Bridges National Monument. These documents would be extremely valuable to managers and planners since they would describe how the Monument was initially conceived and established, and how management decisions and legislation affecting the Monument have changed over time.

The basis for these required historical documents is archival documents and collections. Currently, the Western Archaeological Conservation Center in Tucson has a portion of the archives from Bridges. They have approximately three linear feet of documents and a finding aid for the collection. Additional administrative archives have been processed and a finding aid prepared. This archive is stored in the headquarters of the SEUG in Moab, Utah. With the availability of the finding aids to the administrative archives of the Monument, an administrative and legislative history could be prepared in a cost-effective manner.

Description of Recommended Project or Activity

The administrative and legislative histories of Bridges should be compiled following NPS-28 and NPS-2 guidelines. The administrative and legislative histories will describe how the Monument was established and how its management, boundaries, planning, mandates, etc. changed over time.

Project Statement

NABR-C-005.000

Last Update: 03/07/96
Initial Proposal: 1996

Priority: 14
Page Num: 0002

BUDGET AND FTEs:

-----FUNDED-----				
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
			=====	=====
Total:			0.00	0.00
-----UNFUNDED-----				
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	RES	One-time	30.00	1.00
Total:			30.00	1.00

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : DOC (COVERED BY ANOTHER DOC)

Explanation: 516 DM6 APP. 7.4 B

Project Statement
Last Update: 03/07/96
Initial Proposal: 1996

NABR-C-006.000
Priority: 8
Page Num: 0001

Title : ETHNOGRAPHIC PROGRAM

Funding Status: Funded: 0.00 Unfunded: 107.00

Servicewide Issues : C21 (OVERVIEW)
C22 (USE STUDY)
Cultural Resource Type: ETHN (Ethnographic Resources)
N-RMAP Program codes :
10-238 Package Number :

Problem Statement

Little ethnographic work has been undertaken at Natural Bridges National Monument or on the Grand Gulch Plateau to assess historic use by Native Americans. In 1952 Malcolm Farmer surveyed the area around Natural Bridges National Monument for evidence of Navajo occupation as part of a land claim case. He found a Navajo trail in White Canyon and collected some Navajo ceramics. Historic Ute use of the area is also documented, but is not well understood. The Southern Paiute may also have utilized the area historically.

To determine which Native Americans utilized the Monument in historic and prehistoric times, to ensure NPS is complying with the various laws, mandates and policies related to Native Americans, and to become a better neighbor to Native Americans living next to the Monument, several actions are needed.

Description of Recommended Project or Activity

First, the preparation of an ethnographic overview and assessment of the Monument should be contracted to a qualified ethnographer or ethnohistorian. As described in NPS-28, this report will identify the peoples traditionally associated with Bridges, it will review and summarize existing ethnographic sources and data, and evaluate these sources and data. Limited interviews and discussions will occur with the traditionally associated people in order to supplement and assess the documentary evidence and identify gaps in the available data, as called for in NPS-28. The report will help the National Park Service determine the need for additional ethnographic studies.

In addition to the Overview and Assessment document, the ethnographer or ethnohistorian should review the management of the Monument to determine if there are any laws, policies, or regulations that would violate the rights of Native Americans to use the Monument for traditional or sacred pursuits.

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-006.000
Priority: 8
Page Num: 0002

The contract should also cover the preparation of an Ethnographic Resources Inventory or ERI. The ERI is a component of the Cultural Sites Inventory. It should document the location, description, significance, threats to, and management requirements of Bridge's ethnographic resources.

In addition to the Ethnographic Overview and Assessment, a cultural affiliation study is needed. This ethnographic study satisfies the need to identify cultural ties among past and present groups that occupied and used, and may still use, Monument resources.

In addition, a formal program of consistent communication and outreach with Native Americans is needed. In particular, local Native Americans should be encouraged to apply for work with NPS and the Monument. It would be particularly appropriate if local Native Americans could be hired to work on monitoring and interpretation of cultural resources in the Monument. As a first step, the Superintendent and Personnel staff need to investigate the rules of contiguous hiring authorities to see if they can use these hiring authorities to increase the number of Park Service employed local Native Americans.

BUDGET AND FTEs:

-----FUNDED-----				
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
			=====	=====
Total:			0.00	0.00
-----UNFUNDED-----				
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	RES	Recurring	32.00	1.00
Year 2:	RES	Recurring	25.00	1.00
Year 3:	RES	Recurring	25.00	0.50
Year 4:	RES	Recurring	25.00	0.50
			=====	=====
Total:			107.00	3.00

(Optional) Alternative Actions/Solutions and Impacts

In 1996, the superintendent and chief ranger conducted extensive consultation on the General Management Plan. A letter was sent to various Native American groups living near the Monument to determine whether they had any specific concerns about the

Project Statement

Last Update: 03/07/96
Initial Proposal: 1996

NABR-C-006.000
Priority: 8
Page Num: 0003

General Management Plan in preparation for the Monument. No concerns were expressed; however, very little time was allowed for a written response. The superintendent and chief ranger went to various Navajo Chapter Houses to inform the local Navajo communities about the GMP process. This was the first major step in initiating an ethnographic program for the Monument. In addition, Native Americans have been consulted on interpretive materials developed for the Monument, including the exhibits, brochure, and special handouts designed and produced by Monument staff.

In addition to these actions, the preferred alternative is to contract to a qualified ethnographer or ethnohistorian to work on the various ethnographic documents described above, and to continue to contact Monument-associated peoples.

Compliance codes : DOC (COVERED BY ANOTHER DOC)

Explanation: 516 DM2 APP. 2, 1.6

Project Statement
Last Update: 03/07/96
Initial Proposal: 1996

NABR-C-007.000
Priority: 9
Page Num: 0001

Title : CULTURAL SITE INVENTORY

Funding Status: Funded: 0.00 Unfunded: 11.00

Servicewide Issues : C03 (SITE DOC)
C10 (INVENTORY)
Cultural Resource Type: SITE (Archeological Site)
N-RMAP Program codes :
10-238 Package Number :

Problem Statement

One of the problems managing cultural resources of NABR is that while over 200 prehistoric sites have been recorded, the records are not all available in the Monument or the headquarters of the SEUG. The records are stored at MWACC and the Utah State Historic Preservation Office in Salt Lake City. The first step is copying records that are not available in the Monument or SEUG, and then storing the records as archival collections. The photographic records for the sites also need to be appropriately curated and maintained.

Description of Recommended Project or Activity

USGS topographic maps for the Monument need to be purchased, and mylar overlays made of site locations and survey areas. These need to be maintained by the Monument staff and SEUG archaeologist to provide current information about NABR and its resources.

In addition, the existing site forms need to be copied onto archival acid-free paper, and the photographs of sites need to be stored in an acid-free environment and maintained as archival collections.

BUDGET AND FTEs:

-----FUNDED-----				
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
			=====	=====
Total:			0.00	0.00

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-007.000
Priority: 9
Page Num: 0002

-----UNFUNDED-----				
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	RES	One-time	8.00	0.30
Year 2:	RES	Recurring	1.00	0.10
Year 3:	RES	Recurring	1.00	0.10
Year 4:	RES	Recurring	1.00	0.10
Total:			=====	=====
			11.00	0.60

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : NHPA ((106) NAT. HIST. PRES.)
ARPA (ARCH. RES. PROT. ACT.)

Explanation:

Project Statement

NABR-C-008.000

Last Update: 03/07/96
Initial Proposal: 1996

Priority: 7
Page Num: 0001

Title : COMPLIANCE

Funding Status: Funded: 80.00 Unfunded: 0.00

Servicewide Issues : C70 (ENVRM IMPCT)
C71 (VISIT IMPCT)
Cultural Resource Type: COMB (Combination)
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

One of the most important, if not the most important, responsibilities of the Monument superintendent, chief ranger and archaeologist is to ensure compliance with section 106 of the National Historic Preservation Act. This law requires federal agencies to take into account the effects of their actions on cultural resources listed or eligible for listing in the National Register of Historic Places and to allow the Utah State Historic Preservation Office, the Advisory Council on Historic Preservation and interested members of the public, an opportunity to comment on the undertaking and planned mitigation of adverse effects.

The superintendent, chief ranger, and archaeologist are also responsible for ensuring compliance with other federal cultural resource protection laws, such as the National Environmental Policy Act, the Native American Graves Protection and Repatriation Act, the Native American Religious Freedom Act, etc. Ensuring that the Monument remains in compliance with all these laws and policies is a vital activity for the superintendent, chief ranger, and archaeologist.

Description of Recommended Project or Activity

The archaeologist stationed in the Resource Management Division of the Southeast Utah Group will ensure the Monument remains in compliance with the National Historic Preservation Act, as well as other federal mandates such as the National Environmental Policy Act, the Native American Graves Protection and Repatriation Act, the Native American Religious Freedom Act, etc.

Project Statement

NABR-C-008.000

Last Update: 03/07/96
Initial Proposal: 1996

Priority: 7
Page Num: 0002

BUDGET AND FTEs:

		-----FUNDED-----			
	Source	Activity	Fund Type	Budget (\$1000s)	FTEs
1996:	PKBASE-CR	PRO	Recurring	20.00	0.33
1997:	PKBASE-CR	PRO	Recurring	20.00	0.33
1998:	PKBASE-CR	PRO	Recurring	20.00	0.33
1999:	PKBASE-CR	PRO	Recurring	20.00	0.33
Total:				80.00	1.32

		-----UNFUNDED-----			
		Activity	Fund Type	Budget (\$1000s)	FTEs
Total:				0.00	0.00

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : NHPA ((106) NAT. HIST. PRES.)
EA (ENV. ASSESSMENT)

Explanation:

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-009.000
Priority: 3
Page Num: 0001

Title : SITE MONITORING AND MAINTENANCE

Funding Status: Funded: 10.00 Unfunded: 60.00

Servicewide Issues : C06 (SITE MONIT)
C05 (TREATMENTS)
Cultural Resource Type: COMB (Combination)
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Natural Bridges National Monument was established so the public could access outstanding archaeological sites, but as visitation increases, the cultural resources of the Monument are being increasingly damaged. To determine the kinds of impacts and the impact agents, the sites need to be monitored annually. Based on the data obtained from the monitoring program, and based on consultation with Native American and the interested public, sites may be stabilized, or allowed to deteriorate, or specific management actions may be taken.

Eleven sites within the Monument were stabilized during the 1980's. Since stabilization, the sites have been monitored annually. Minor repairs have been performed as needed. Based on the monitoring program data, numerous other structures and sites need to be stabilized.

Description of Recommended Project or Activity

The current site monitoring and maintenance program will be continued based upon continuation of cultural cyclical and historic preservation funding. Some 11 sites will be monitored and stabilized by a trained stabilization specialist. This on-going monitoring and stabilization of the more popular and visited sites in Natural Bridges will partially enable NPS to fulfill its legal mandates to attempt to preserve and protect sites, while allowing for the impacts of increasing tourism.

Project Statement

NABR-C-009.000

Last Update: 03/07/96
Initial Proposal: 1996

Priority: 3
Page Num: 0002

BUDGET AND FTEs:

-----FUNDED-----					
	Source	Activity	Fund Type	Budget (\$1000s)	FTEs
1996:	RG-CR-MTN	MON	Cyclic	10.00	0.20
Total:				10.00	0.20
-----UNFUNDED-----					
		Activity	Fund Type	Budget (\$1000s)	FTEs
Year 2:		MON	Recurring	20.00	0.50
Year 3:		MON	Recurring	20.00	0.50
Year 4:		MON	Recurring	20.00	0.50
Total:				60.00	1.50

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : ARPA (ARCH. RES. PROT. ACT.)
OTHER ()

Explanation: 516 DM2 APP. 2, 1.6

Project Statement
Last Update: 03/07/96
Initial Proposal: 1996

NABR-C-010.000
Priority: 4
Page Num: 0001

Title : ARPA SITE PATROLS, STAFF TRAINING

Funding Status: Funded: 0.00 Unfunded: 84.00

Servicewide Issues : C07 (SITE PROTCT)
C72 (PROTECTION)

Cultural Resource Type: SITE (Archeological Site)

N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Visitation to Natural Bridges National Monument has increased markedly over the past few years. Along with this increase, vandalism and deterioration of cultural resources has increased. In the past years there have been two known incidents of vandalism (rock art battering), and many of the sites are losing their surface artifacts due to visitor souveniring. In addition to deliberate vandalism and looting of sites, visitor's lack of knowledge of proper site etiquette is causing significant damage to cultural resources. Unknowing visitors climb on walls and damage structures, build walls, and disturb middens. As visitation increases, these disturbances of cultural resources will increase. While the ultimate solution to this problem lies in public education, an immediate solution lies in increasing the number of contacts between visitors and rangers trained in cultural resource protection.

Description of Recommended Project or Activity

To eliminate human-caused destruction of archeological resources at Natural Bridges National Monument, increased ranger patrol is recommended. The presence of a uniformed patrol ranger is instrumental in stopping most destructive activities before they start. A ranger can educate visitors in proper conduct when visiting archaeological sites and a ranger can significantly enhance visitor awareness, understanding, and experiences. As a general rule the public expects and desires ranger contact and current low staffing levels at the Monument allow for few opportunities for interaction between visitors and park staff. In sum, a year-round patrol ranger is needed to ensure the preservation and protection of cultural resources. This ranger must be trained in enforcement of the Archaeological Resources Protection Act.

Project Statement

NABR-C-010.000

Last Update: 03/07/96

Priority: 4

Initial Proposal: 1996

Page Num: 0002

BUDGET AND FTES:

-----FUNDED-----				
Source	Activity	Fund Type	Budget (\$1000s)	FTES
			=====	=====
Total:			0.00	0.00
-----UNFUNDED-----				
	Activity	Fund Type	Budget (\$1000s)	FTES
Year 1:	PRO	Recurring	21.00	1.00
Year 2:	PRO	Recurring	21.00	1.00
Year 3:	PRO	Recurring	21.00	1.00
Year 4:	PRO	Recurring	21.00	1.00
Total:			84.00	4.00

(Optional) Alternative Actions/Solutions and Impacts

1. No Action. Under the no action alternative, patrols of cultural resources in the Monument will continue to be limited. This will result in increased damage to cultural resources through vandalism and through inadvertent impacts caused by increased visitation and lack of education about site etiquette.

2. Preferred Alternative. The preferred alternative is to provide funding for increased ranger presence throughout the Monument. Rangers would be trained in the interpretation and protection of cultural resources and they would impart this knowledge to visitors. This would help preserve and protect cultural resources, and would enhance visitor's experiences in the Monument.

Compliance codes : ARPA (ARCH. RES. PROT. ACT.)

Explanation:

Project Statement
Last Update: 03/07/96
Initial Proposal: 1996

NABR-C-011.000
Priority: 6
Page Num: 0001

Title : INTERPRETATION OF CULTURAL RESOURCES

Funding Status: Funded: 0.00 Unfunded: 60.00

Servicewide Issues : C80 (ARCHEOLOGY)
C95 (INTERPRET)
Cultural Resource Type: COMB (Combination)
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Natural Bridges was set aside as a National Monument to preserve three extraordinary natural bridges and "...certain surrounding prehistoric ruins". However, despite the importance of prehistoric and historic resources of the Monument, interpretation of cultural resources has been limited. Interpretation of cultural resources of the Monument must be improved to ensure preservation and protection of the cultural resources of the Monument.

Description of Recommended Project or Activity

The recommended action is to fund additional seasonal interpreters, and to provide training in cultural resources, archeology, history, and ethnography, for the interpreters. In addition, funding is needed to provide Monument-specific brochures, signs, books, and information about cultural resources. While wayside exhibits have been installed in the Monument, additional opportunities exist for enhanced interpretation of cultural resources. By funding additional interpreters and by training these interpreters, the public will have an increased opportunity to learn about the past, and as a result, visitor's respect for cultural resources will be increased and visitor impacts to cultural resources will be decreased.

BUDGET AND FTEs:

-----FUNDED-----				
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
			=====	
Total:			0.00	0.00

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-011.000
Priority: 6
Page Num: 0002

-----UNFUNDED-----				
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	INT	Recurring	15.00	0.50
Year 2:	INT	Recurring	15.00	0.50
Year 3:	INT	Recurring	15.00	0.50
Year 4:	INT	Recurring	15.00	0.50
Total:			=====	=====
			60.00	2.00

(Optional) Alternative Actions/Solutions and Impacts

The preferred alternative of providing additional funds to hire seasonal interpretive rangers, new brochures, wayside exhibits, visitor center exhibits, and books about cultural resources of the Monument will result in increased public awareness, understanding and appreciation of the past. This should result in significantly reduced vandalism to sites in and out of the Monument.

Compliance codes : ARPA (ARCH. RES. PROT. ACT.)
OTHER ()

Explanation: 516 DM2 APP. 2, 1.1

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-012.000
Priority: 5
Page Num: 0001

Title : SITE PROTECTION

Funding Status: Funded: 0.00 Unfunded: 80.00

Servicewide Issues : C07 (SITE PROTCT)
C71 (VISIT IMPCT)

Cultural Resource Type: SITE (Archeological Site)

N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Preservation and protection of cultural resources involves both direct and indirect methods of protection from visitor impacts. Direct protection refers to physical changes made to sites to prevent adverse behavioral impacts of visitors such as crowding, vandalism, souveniring, etc. Indirect protection refers to policy and education that lead to positive changes in visitors behavior at sites.

For direct physical protection, a variety of management actions are needed including ranger patrols, stabilization, and development and installation of physical protective devices at highly visited (and highly damaged) sites. While other project statements deal with stabilization and patrols, this statement covers the need for site specific planning to develop and install protective devices to combat the adverse behavioral impacts of crowding, unequal use patterns, vandalism, souveniring, etc.

For indirect protection, this statement covers some of the policies that are needed such as site disclosure policies, nomination of sites to the National Register or World Heritage List, etc.

Description of Recommended Project or Activity

For direct physical protection, site management plans must be developed to better manage visitation to cultural sites in Bridges. These plans must address means of mitigating visitor impacts and controlling specific behaviors of visitors at sites through direct physical protective measures. For example, direct physical protective management measures that will be examined for use at sites in Bridges include designing pathways, erection of signs, barriers, register boxes, printing brochures, and providing increased information about sites. Once site specific management plans are written, and direct physical protective devices are planned, they will need to be implemented and the devices installed and maintained. (Other types of direct physical

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-012.000
Priority: 5
Page Num: 0002

protection, such as stabilization of sites, and ranger patrols, are addressed in other project statements.)

Indirect protection includes the site disclosure policy, which directs visitors to sites which receive direct physical protection, and nomination of sites and districts to the National Register or other listings. By recognizing sites and districts as significant and important, and by publicizing this significance, the Park Service can increase visitor's respect for cultural resources in the Monument. Hopefully, increased respect will result in reduced vandalism of sites.

BUDGET AND FTEs:

Source		Activity	FUND Type	Budget (\$1000s)	FTEs
			Total:	0.00	0.00

		Activity	FUND Type	Budget (\$1000s)	FTEs
Year 1:		PRO	Cyclic	20.00	0.50
Year 2:		PRO	Cyclic	20.00	0.50
Year 3:		PRO	Cyclic	20.00	0.50
Year 4:		PRO	Cyclic	20.00	0.50
			Total:	80.00	2.00

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : ARPA (ARCH. RES. PROT. ACT.)
NHPA ((106) NAT. HIST. PRES.)

Explanation:

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-013.000
Priority: 12
Page Num: 0001

Title : DATA RECOVERY OF SITE 42SA18637

Funding Status: Funded: 0.00 Unfunded: 70.00

Servicewide Issues : C04 (DATA RECOV)
Cultural Resource Type: SITE (Archeological Site)
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Archaeological Site 42Sa18637 lies immediately adjacent to the existing Campsite #6 in the campground at Natural Bridges National Monument. SEUG policy, as stated in a Superintendent's Directive, is that no camping is permitted within 300 ft. of archaeological sites. To comply with SEUG policy, and to mitigate adverse effects of campers on this archaeological site, the site should be tested for significance and assuming significance, then data recovery should be undertaken at the site.

Description of Recommended Project or Activity

The recommended action is to test the site for significance, and then assuming it is significant, to fully excavate the subsurface features at the site and perform full data recovery based on the Secretary of the Interior's Standards and Guidelines.

BUDGET AND FTEs:

		-----FUNDED-----		
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
			=====	=====
		Total:	0.00	0.00
		-----UNFUNDED-----		
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	MIT	One-time	50.00	1.00
Year 2:	MIT	One-time	20.00	1.00
		Total:	70.00	2.00

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-013.000
Priority: 12
Page Num: 0002

(Optional) Alternative Actions/Solutions and Impacts

1. No Action. If no action is taken, NPS will continue to be in violation of its own policy about not allowing camping on archaeological sites, and more importantly the site will continue to be disturbed by campers. Surface and subsurface remains in the site will continue to be trampled, scattered and possibly collected and vandalized. Currently, small depressions (50cm diameter, 6 cm deep) have been excavated in the site, not as deliberate vandalism or pothunting, rather children appear to have been playing. The site is particularly vulnerable to the collection of surface artifacts and theft of these artifacts from campers.

2. Testing and Mitigation. The site has been recorded as a significant cultural resource since it is likely to yield significant information about the prehistory of the Monument. A test for subsurface features should be undertaken and assuming the presence of subsurface features and deposits, full mitigation and data recovery should be conducted. This will bring the Monument back into compliance with its policies about the distance between campgrounds and archaeological sites. It will mitigate damage to the sites occurring from increased visitation.

Compliance codes : ARPA (ARCH. RES. PROT. ACT.)
NHPA ((106) NAT. HIST. PRES.)

Explanation:

Last Update: 03/07/96
Initial Proposal: 1996

Project Statement

NABR-C-014.000
Priority: 10
Page Num: 0001

Title : NAGPRA COMPLIANCE

Funding Status: Funded: 0.00 Unfunded: 2.00

Servicewide Issues : C46 (ACCOUNTBLY)
C25 (CULT. AFFIL)

Cultural Resource Type: OBJC (Object)

N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Natural Bridges National Monument collections contain human remains from two archaeological sites. While the inventory and summary of these remains have been submitted to tribes that might be culturally affiliated with the remains, the consultation process is just beginning. Funding is necessary to ensure that the Native Americans that wish to repatriate these remains will be able to travel to NABR and that continuing consultation as mandated by NAGPRA occurs.

Description of Recommended Project or Activity

Funding is needed to ensure compliance with NAGPRA. Native Americans will probably have to be brought to the Monument, their travel and time will need to be paid for by the NPS.

BUDGET AND FTEs:

		-----FUNDED-----		
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
			=====	=====
		Total:	0.00	0.00
		-----UNFUNDED-----		
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	RES	One-time	1.00	0.10
Year 2:	RES	Recurring	1.00	0.10
		Total:	2.00	0.20

Project Statement
Last Update: 03/07/96
Initial Proposal: 1996

NABR-C-014.000
Priority: 10
Page Num: 0002

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : DOC (COVERED BY ANOTHER DOC)

Explanation: 516 DM2 APP. 2, 1.4

Project Statement
Last Update: 03/08/96
Initial Proposal: 1996

NABR-I-001.000
Priority: 2
Page Num: 0001

Title : GEOGRAPHIC INFORMATION SYSTEM DEVELOPMENT

Funding Status: Funded: 0.00 Unfunded: 40.00

Servicewide Issues : N20 (BASELINE DATA)
N24 (OTHER (NATURAL))

Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

In 1994 the SEUG acquired a Geographic Information System. This has been an important priority of the Southeast Utah Group, particularly in the assessment of external issues. Oil and gas exploration is increasing in Southeast Utah and the area is currently the most active exploration area in the United States. Oil and gas exploration is planned for the area directly south of Natural Bridges National Monument within a few miles of the monument boundary. A geographic information system will allow the Monument to respond to external issues rapidly and accurately. This information is essential in the development of adequate environmental assessments, which are coming under more intense scrutiny due to the nature of politics on the Colorado Plateau. A Geographic Information System will provide the SEUG staff with the ability to rapidly analyze, compare and record a variety of physical information and to create composite records of mapping information.

A GIS can be coupled with the advanced location technology available in the form of a Global Positioning System. For a reasonable cost, SEUG can add a GPS to the GIS. A Global Positioning System can enable SEUG to accurately locate sites in the field through satellite technology and to record that information in UTM coordinates or Latitude and Longitude and later import that information into the GIS. Accurate mapping can be accomplished through the differential use of two GPS units. This would expand the cost but would allow for the accurate mapping of lines and polygons and the determination of area within polygons. Application of this technology is important in the recording of backcountry impacts and vegetation communities, particularly the mapping of exotic plant infestations. Accurate mapping and determination of archaeological sites is also a benefit. Current Monument records of cultural sites are grossly inaccurate.

SEUG currently (1995) has a small data base of digitized information available for use with GIS. This database is limited to some riparian area information purchased from the Bureau of Land Management. Recent soil surveys have been produced for the area and the group is in the process of having that information

Project Statement

Last Update: 03/08/96
Initial Proposal: 1996

NABR-I-001.000
Priority: 2
Page Num: 0002

digitized. The DMA and DLG information for areas covered by the Southeast Utah Group have been acquired and are available now that the group has acquired the GIS hardware. GISD has produced some viewshed analysis maps for the Natural Bridges General Management Plan and this information is available for importation. In addition, the Monument infrastructure is now being accurately mapped so that management and maintenance personnel know where underground cables, gas, telephone, and electric lines, and other facilities are located.

Currently, the major user of the system is the Resource Management Division with lesser use by other divisions. Over time, greater inter-divisional use will undoubtedly occur.

Due to the remote nature of the Monument in relation to SEUG headquarters it may be desirable for a GIS for local use. Acquisition of a relatively inexpensive GIS that could be operated on a PC is the best alternative. EPPL 7 is a GIS software, available for a reasonable cost (\$500), that would suit the Monument's needs. With a database being developed for the Southeast Utah Group, cost for data acquisition would be minimal.

GIS Project Statements for the SEUG GIS are also referenced in the Resource Management Plans for Arches and Canyonlands National Parks.

Description of Recommended Project or Activity

The Southeast Utah Group proposes to acquire a Sun SPARCstation IPC and peripherals including a digitizing tablet and ink jet plotter. This system would be used by the group to support management of the Monument. Database themes need to be developed such as vegetation, external threats, endangered species habitat and archaeology. The group also proposes to acquire a Global Positioning System such as a Trimble Basic. As the system develops a full-time GIS operator will be needed. In addition it is desired that the Monument have a GIS supporting EPPL 7 on an IBM PC compatible computer. A additional PC would have to be acquired to support the system.

Funding reflects the proportion of the SEUG and Rocky Mountain Regional Office expenses needed to purchase GIS hardware, to acquire data themes and support an operator, prorated for the portion that would support Natural Bridges. A one time cost of \$5,000 is included for the purchase of a PC, EPPL 7 software and peripherals needed to establish a GIS for the Monument.

Project Statement
Last Update: 03/08/96
Initial Proposal: 1996

NABR-I-001.000
Priority: 2
Page Num: 0003

BUDGET AND FTEs:

-----FUNDED-----				
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
			=====	=====
Total:			0.00	0.00
-----UNFUNDED-----				
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	RES	Recurring	10.00	0.10
Year 2:	RES	Recurring	10.00	0.10
Year 3:	RES	Recurring	10.00	0.10
Year 4:	RES	Recurring	10.00	0.10
Total:			=====	=====
			40.00	0.40

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : DOC (COVERED BY ANOTHER DOC)

Explanation: 516 DM2 APP. 2, 1.6

Project Statement

NABR-I-002.000

Last Update: 03/08/96
Initial Proposal: 1994

Priority: 1
Page Num: 0001

Title : INTEGRATED PEST MGMT AND PROGRAMING

Funding Status: Funded: 13.00 Unfunded: 12.00

Servicewide Issues : N05 (NON-NAT PLANTS)
N24 (OTHER (NATURAL))

Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Rodents

In 1994 the Hantavirus made national news as dozens of people became affected with a mysterious, rapidly progressing respiratory ailment that often proved fatal. Soon it was learned that exposure to a virus carried by rodents (particularly in feces and urine) was to blame. Enclosed areas where rodents overwinter can be dangerous for humans. Aside from the obvious health risks posed by this scenario, rodents cause damage to building structures and their contents (both structures currently in use and structures of antiquity). During cool weather at Natural Bridges National Monument mice invade buildings to acquire food, water and shelter. In so doing, these rodents pose a health and resource hazard that needs to be addressed.

Current management action centers on exclusion of rodents from buildings by sealing all means of entry, using traps to kill rodents inside buildings, and using a rodenticide (Rozol) in the facility and residential areas adjacent to buildings. When rodents are identified as invading archeological structures they may also be trapped.

Insects

Insects have been a recurring problem inside the visitor center where they have infested natural history specimens causing their replacement. With \$120,000 worth of new exhibitry being installed in FY96 it is imperative that integrated pest control measures be taken to safeguard this investment.

Disturbed Area Vegetation

Due to development in the Monument for facilities and roads to support public visitation, site disturbance has created a suitable environment for some aggressive species of exotic plants as well as creating habitat for unnatural concentrations of native invader species. The major problem areas are along the entrance and loop road, and along utility corridors in the developed zone. These areas support invader species such as

Last Update: 03/08/96
Initial Proposal: 1994

Priority: 1
Page Num: 0002

rabbitbrush (*Chrysothamnus nauseosus*), snakeweed (*Gutierrezia sarothrae*) and big sagebrush (*Artemisia tridentata*). Exotic plants that colonize disturbed areas in the Monument are Russian thistle (*Salsola kali*) and horehound mint (*Marrubium vulgare*).

Mowing of the road shoulders has been done in the past in an effort to improve the appearance and to provide for greater public safety. This also helps to control the spread of exotics such as horehound mint. Due to the ecological requirements of the three native invader species there is little likelihood that they will become a greater nuisance. With time, as long as there is no further disturbance along the road shoulders, native species such as roundleaf buffaloberry and big sagebrush will probably reclaim the road shoulders. Russian thistle can be an annoyance in some areas directly following disturbance, but generally does not persist. As long as ground disturbance is minimized this plant will not be a problem.

Tamarisk

Tamarisk (*Tamarix ramosissima*) is an exotic plant of concern due to its tendency to invade and dominate riparian areas. Some tamarisk is present in the Monument and it is possible that it could become established if given enough time. Tamarisk had been nearly eradicated in the Monument in the past due to control efforts, but continued success will require on-going vigilance. As this species is widespread throughout the southwestern United States and prevalent along riparian areas in San Juan County, Utah, its seed will continue to be blown into the Monument and washed downcanyon. A tamarisk management plan was written in 1990 addressing control strategies for the Monument, and a survey of tamarisk has been accomplished with infestations being mapped.

The Monument continues to effect control actions on the infestations by cutting and applying Garlon to the cut stumps. In 1991 the Monument received money for a tamarisk control project and many tamarisk stands were eliminated using the cut stump treatment with Garlon 4. A total of 252 man hours were expended in the removal of 1,415 tamarisk stems over 0.5 inches in diameter. 212 ounces of Garlon 4 were used. Follow up monitoring has been carried out since and will be required on an on-going basis to be effective.

Steps have been taken to control the acquisition of EPA registered chemicals and an effort to educate the park staff in the Integrated Pest Management process has been started. The Administrative Division for the Southeast Utah Group has begun to exclude the purchase of pesticides from blanket purchase order contracts with local businesses and all DI-1s for pesticides must be approved by the Natural Resource Specialist for the Group to assure that the product has been approved and that the IPM process has been adhered to. Pesticide use in the Monument has been kept to a minimum. No fundamental changes in pesticide need are likely to occur.

Last Update: 03/08/96
Initial Proposal: 1994

Project Statement

NABR-I-002.000
Priority: 1
Page Num: 0003

Description of Recommended Project or Activity

This option would allow for the protection of the public and the Monument's staff by providing for compliance with the National Park Service guidelines for the use of pesticides as well as assuring that only minor amounts of low toxicity pesticides would be used following a full review of the problem and consideration of other alternatives.

Rodents

Monument staff would continue to monitor for mice in the facility and residence area and visitor center. Exclusion, sanitation, and mechanical means of control would continue, with chemical control as a last alternative.

Insects

An Integrated Pest Control Plan needs to be developed to address the infestation problem that currently exists within the visitor center. Monument staff would work with Harpers Ferry and SEUG RM staff to develop procedures to implement an effective IPM Plan.

Disturbed Area Vegetation

Monument staff would continue to monitor the status of aggressive native plants and exotic species of plants for impacts on the Monument's resources. Revegetation efforts would commence following significant ground disturbances to encourage the rapid regrowth of native ground cover.

Tamarisk

Tamarisk would be controlled according to the strategies set down in the Tamarisk control plan, and herbicide use would be limited to Garlon 3A, Garlon 4 or new herbicides which prove to be more effective and more environmentally safe. Pesticide use would be in accordance with approved safety practices, and training would be available to Monument staff. This would assure that Monument vegetation in riparian areas would persist in a pristine state.

BUDGET AND FTEs:

	Source	Activity	FUNDING Fund Type	Budget (\$1000s)	FTEs
1994:	PKBASE-NR MIT		Recurring	2.50	0.10
1995:	PKBASE-NR MIT		Recurring	3.00	0.20
1996:	PKBASE-NR MIT		Recurring	3.50	0.20
1997:	PKBASE-NR MIT		Recurring	4.00	0.20

Last Update: 03/08/96
Initial Proposal: 1994

Project Statement

NABR-I-002.000
Priority: 1
Page Num: 0004

		=====	
Total:		13.00	0.70
-----UNFUNDED-----			
	Activity	Fund Type	Budget (\$1000s) FTEs
Year 3:	MON	Recurring	5.00 0.25
	ADM	One-time	2.00 0.10
	Subtotal:		7.00 0.35
Year 4:	MON	Recurring	5.00 0.25
	Total:		12.00 0.60
		=====	

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : EXCL (CATEGORICAL EXCLUSION)

Explanation: 516 DM2 APP. 2, 1.6

Project Statement

NABR-N-001.000

Last Update: 03/08/96
Initial Proposal: 1994

Priority: 13
Page Num: 0001

Title : EXTERNAL ISSUES MONITORING AND ASSESSMENT

Funding Status: Funded: 35.50 Unfunded: 0.00

Servicewide Issues : N06 (LAND USE PRAC)
N24 (OTHER (NATURAL))

Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

The external threats to Natural Bridges National Monument are diverse and are representative of many of the problems facing most units of the National Park Service. Natural Bridges is remote and the area is largely undeveloped; the adverse effects of activities on adjacent lands can be more pronounced. The viewshed from Natural Bridges is largely pristine. Visitors often comment on the natural quiet and the quality of the air.

Mining

Past mining activities are visible from the park, particularly on Elk Ridge and Woodenshoe Butte to the north. Workings, tailings, and mine access roads are evident. In the event of a rise in the price of uranium, possible future exploitation of uranium within the vicinity of Natural Bridges is likely. Impacts could include subsidence due to underground mining, surface disturbance, cyanide leaching, and uranium contamination of groundwater sources or from contaminated dust.

Oil and Gas

Oil and gas exploration issues are covered in Project Statement NABR-N-002.

Disturbed Lands

Chainings have occurred in the area, but by and large they are not noticeable from within the Monument. However, any lands disturbed in the arid environment of the Colorado Plateau contribute dust to the air which further compounds the regional and local haze problem. This area has been noted for the pristine quality of the air and its clear views.

Grazing

Grazing issues are documented in a separate Project Statement NABR-N-013.

Development

Project Statement

Last Update: 03/08/96
Initial Proposal: 1994

NABR-N-001.000
Priority: 13
Page Num: 0002

Increased development near the Monument has the potential for drawdown of the aquifer, contamination of the aquifer by sewage, and visual intrusion from building and vehicle congestion. Visitation is increasing concurrent with increased visitation throughout the Colorado Plateau. The small campground in the Monument fills daily from April through October. There are no other campground facilities between Blanding and Hite Marina. As a consequence, overflow campers are currently being steered to a large open area on BLM land that is also used by the Utah Highway Department for gravel storage for road projects. There are no camper facilities here and this is intended as a short term solution only.

Solid Waste Management

Solid waste disposal is another problem resulting from increased development, and waste is transported at great expense to an approved landfill. This may not be adequately provided for by developers and clandestine dumping could result.

Public Lands Management

Natural Bridges National Monument is surrounded by publicly controlled lands with the majority of the land being administered by the Bureau of Land Management. The State of Utah is also a major land owner with control of 10 percent of the local land base. The US Forest Service has large land holdings just north of the Monument. The nearest private land holdings (960 acres) are located four miles north of the park on Deer Flat. While this combination of land ownerships has been favorable to the management of the Monument, the National Park Service is concerned about the possibility of future land exchanges and the privatization of State lands in the area. The fact that the lands surrounding the Monument are managed by agencies with mandates for multiple use may not ensure protection of the Monument from impacts associated with development. Staff must remain vigilant in their effort to protect Monument resources from potential harm due to adverse effects of external uses of public lands in and around the Monument. Good inter-agency communications must be maintained.

Aircraft Overflights

Aircraft overflights, primarily commercial sightseer flights, are becoming an increasingly popular activity and consequently a problem for parks in the Southwestern United States. Given the attraction of viewing Natural Bridges from the air, it is likely the problem will impact the natural quiet and stillness that so many visitors seek and enjoy. The establishment of a regional airport at Hall's Crossing in Glen Canyon National Recreation Area will likely compound this problem.

Last Update: 03/08/96
Initial Proposal: 1994

Project Statement

NABR-N-001.000
Priority: 13
Page Num: 0003

Description of Recommended Project or Activity

To best insulate Natural Bridges National Monument from the threats of adverse outside development, the Monument's management staff and that of the SEUG must be active partners in planning activities in southern San Juan County, Utah and in the Colorado Plateau in general. Improving communications with the Bureau of Land Management, State of Utah Department of Natural Resources, and various other State and Federal agencies is paramount and will do much to develop an early warning system for the Monument.

Mining

The results of past mining activities need to be monitored to ensure that there are no on-going impacts on the Monument. Staff must be knowledgeable of all mines in the area, particularly those that could drain into headwaters that enter the Monument. A monitoring program must be developed to accomplish this. SEUG Resource Management staff must keep tuned to changes in economic conditions that may initiate renewed interest in developing uranium claims or in reworking old mines.

Disturbed Lands

The SEUG Resource Management staff will continue to monitor activities by public land management agencies to alter or convert native vegetation for livestock production. Due to the NEPA process, the National Park Service is in an excellent position to review and comment on BLM and USFS activities. Closer attention needs to be directed at State land management activities.

Recreational Development

The National Park Service recognizes the need for facilities to support recreation and the growing tourist industry in Southeast Utah; in particular, the need for a regional campground to service the Cedar Mesa area. In 1995, the ownership of Fry Canyon (24 miles west of NABR) changed hands and increased visitor services have resulted. Nearby developments at Hall's Crossing and Hite Marina have also been noted. The SEUG Resource Management staff will continue to monitor development activities and will participate in regional planning efforts as much as possible.

Solid Waste

The National Park Service no longer uses a landfill that was located on BLM lands. Currently solid waste is hauled to a dump near Blanding, Utah. No Federally approved landfill is available in the Four Corners Area. The National Park Service is working with the BLM, the US Forest Service, and the City of Blanding in an effort to develop an approved landfill. The SEUG has an active recycling program that Natural Bridges participates in. This has resulted in a significant resource recovery program.

Last Update: 03/08/96
Initial Proposal: 1994

Project Statement

NABR-N-001.000
Priority: 13
Page Num: 0004

Public Lands Management

The SEUG Resource Management staff and the staff of Natural Bridges National Monument will continue to monitor activities on lands in the Southeast Utah area in order to ameliorate impacts on the Monument from external uses. Where possible, the National Park Service will participate in joint planning efforts with other public agencies. The NPS will continue to monitor the NEPA process to review and comment as needed.

Aircraft Overflights

Aircraft overflights must be monitored to gather baseline information to allow the National Park Service to be able to intelligently address the issue should it become a significant threat to the Monument. An active noise monitoring program has been in effect since the fall of 1994.

BUDGET AND FTEs:

-----FUNDED-----					
	Source	Activity	Fund Type	Budget (\$1000s)	FTEs
1994:	PKBASE-NR	MON	Recurring	8.00	0.20
1995:	PKBASE-NR	MON	Recurring	8.50	0.20
1996:	PKBASE-NR	MON	Recurring	9.00	0.30
1997:	PKBASE-NR	MON	Recurring	10.00	0.30
Total:				35.50	1.00
=====					
-----UNFUNDED-----					
		Activity	Fund Type	Budget (\$1000s)	FTEs
Total:				0.00	0.00

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : EA (ENV. ASSESSMENT)

Explanation: 516 DM2 APP. 2, 1.6

Last Update: 03/08/96
Initial Proposal: 1994

Project Statement

NABR-N-002.000
Priority: 12
Page Num: 0001

Title : EXTERNAL ISSUES OIL AND GAS DEVELOPMENT

Funding Status: Funded: 14.00 Unfunded: 0.00

Servicewide Issues : N06 (LAND USE PRAC)
N24 (OTHER (NATURAL))

Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Due to the dynamic salt dome formations in the Southeast Utah area, there is a high potential for the recovery of economically exploitable oil and gas deposits. Past exploration has encountered some oil, but there are many problems associated with the production of oil in this area due to the plasticity of salt beds and technological shortcomings. One world class oil field at Aneth, Utah has been producing oil since 1956. Other smaller fields around Blanding, Utah have been in production for many years. None of these fields are drilled into salt domes.

In 1990, a well was drilled in the Paradox formation near Moab, Utah utilizing horizontal drilling techniques which allow for very accurate interception of oil bearing shales within the salt formation. The technique established a well which has produced an initial test of 1,000 barrels per day and which has been operating for a year at over 500 barrels per day. A second well in the same area came in at 1,200 barrels per day. This success has markedly increased oil exploration in the Southeast Utah area. The area is now (1991) considered to be one of the most important oil exploration areas in the United States. Both the BLM and the State of Utah have been involved in increased oil and gas leasing, some of it within the immediate vicinity of Natural Bridges National Monument. Several exploratory wells are proposed for the White Canyon area west of the Monument.

The Resource Management Division for the SEUG is actively communicating with the BLM and the State of Utah in an effort to stay informed of planned oil and gas development activity at the earliest possible level. The Group has been reviewing Environmental Assessments and commenting on them as appropriate. The Branch of Mining and Minerals and the Intermountain Field Area Office have also been reviewing these Environmental Assessments. All such activity has occurred well north and east of Natural Bridges National Monument. Due to the importance of the Monument Upwarp in potential oil field development, it is anticipated that exploration activity will occur near Natural Bridges in the near future.

Anticipated environmental impacts of exploratory activities near

Last Update: 03/08/96
Initial Proposal: 1994

Project Statement

NABR-N-002.000
Priority: 12
Page Num: 0002

the Monument would be: increased vehicle activity, visual intrusion, impacts on nightsky resources, audio intrusions, increased atmospheric dust, and possible drawdown on the aquifer. Impacts likely to be associated with production activities would be the same but would be longer term. Cumulative effects of a number of activities need to be considered.

Description of Recommended Project or Activity

The SEUG Resource Management Division will continue to stay informed and abreast of oil and gas exploration and development in the Southeast Utah area. Every effort will be made to communicate with these agencies at the earliest opportunity to ensure that the Monument is protected from this external development. All pertinent environmental planning documents will be reviewed and commented on. Oil and gas activity in the vicinity of the Monument will be closely monitored.

BUDGET AND FTEs:

-----FUNDED-----					
	Source	Activity	Fund Type	Budget (\$1000s)	FTEs
1994:	PKBASE-NR	MON	Recurring	3.00	0.10
1995:	PKBASE-NR	MON	Recurring	3.00	0.10
1996:	PKBASE-NR	MON	Recurring	4.00	0.10
1997:	PKBASE-NR	MON	Recurring	4.00	0.10
Total:				14.00	0.40
-----UNFUNDED-----					
		Activity	Fund Type	Budget (\$1000s)	FTEs
Total:				0.00	0.00

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : EXCL (CATEGORICAL EXCLUSION)

Project Statement

Last Update: 03/08/96
Initial Proposal: 1994

NABR-N-002.000
Priority: 12
Page Num: 0003

Explanation: 516 DM2 App. 2, 1.6

Last Update: 03/08/96
Initial Proposal: 1994

Project Statement

NABR-N-003.000
Priority: 6
Page Num: 0001

Title : WATER SYSTEM MANAGEMENT

Funding Status: Funded: 74.00 Unfunded: 10.00

Servicewide Issues : N11 (WATER QUAL-EXT)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Water is critical to the management and administration of Natural Bridges National Monument. Water resources are subject to additional pressure due to the need to support visitation at this remote desert location. There are only two wells currently in operation that are likely to effect the aquifer, and both of these wells are owned and operated by the National Park Service. There is concern about the adequacy of the current water system, and conservation measures are being used. A compounding problem is the remoteness of the Monument and that many visitors do not bring sufficient water supplies with them. The Monument currently provides up to five gallons free of charge. This does not exceed the capabilities of the water system and it is felt the Monument can continue to provide this service if visitation levels do not increase significantly.

The water supply for the Monument presently consists of three wells. Well #1 which was drilled in 1966 went dry in 1975. Well #1 has not been plugged and abandoned. This may be indicative of future drawdown problems on the other water wells and the aquifer as a whole. Well #2 is 648 feet deep and produces a flow of 5.0 gallons per minute. Well #3 is 520 feet deep and produces a flow of 5.0 gallons per minute. This represents an increase of 25% over the combined flow of both wells as reported in 1985. In 1994 consumption was at 842,000 gallons per year as compared with 818,000 gallons used in 1985. The system is served by one pressure pump and a 50,000 gallon storage tank. The water is tested in accordance with Utah State laws. The system supports a residence area with three permanent houses, a three unit apartment building, two modular homes and a laundry room as well as a maintenance building, maintenance trailer, and visitor center. There is a total of seven permanent staff as well as nine seasonal employees living in the Monument. The system also supports a total visitation (1995) of 150,000 people of which 7,800 use the campground.

Last Update: 03/08/96
Initial Proposal: 1994

Project Statement

NABR-N-003.000
Priority: 6
Page Num: 0002

Description of Recommended Project or Activity

Water Supply

The system was upgraded in 1982 and is more than adequate for Monument needs given current and anticipated visitation. This alternative would meet the legal requirements for health and human safety and would not further impact the Monument, provided that Monument operations are not excessively depleting the aquifer. The Monument needs to develop a monitoring program to monitor the depth of water in the well on a regular basis to document drawdown effects.

Should visitation increase dramatically or if well production drops, a need might arise for augmentation of the water system. However, conservation measures would have to be instituted and an assessment of the aquifer's capabilities to produce more water would have to be made. An assessment of the aquifer is needed to determine if additional wells can be drilled in the vicinity of the Monument for the production of additional water, without adversely impacting ground water resources. The cost for a hydrologic study is estimated at \$15,000 per year for two years.

Water could be hauled to the Monument as an interim measure as is done at other NPS areas in the Southeast Utah Group, but only at great cost.

Well #1 needs to be plugged to meet legal requirements for abandonment. This should incur a one-time cost of \$15,000.

BUDGET AND FTEs:

			-----FUNDED-----		
	Source	Activity	Fund Type	Budget (\$1000s)	FTEs
1994:	TEMP\$-NR	ADM	Recurring	7.00	0.30
	RG-NS-RES	ADM	One-time	15.00	0.10
	RG-NS-RES	RES	One-time	15.00	0.10
			Subtotal:	37.00	0.50
1995:	TEMP\$-NR	ADM	Recurring	7.00	0.30
	RG-NS-RES	RES	One-time	15.00	0.10
			Subtotal:	22.00	0.40
1996:	TEMP\$-NR	ADM	Recurring	7.50	0.30
1997:	TEMP\$-NR	ADM	Recurring	7.50	0.30
			Total:	74.00	1.50

Last Update: 03/08/96
Initial Proposal: 1994

Project Statement

NABR-N-003.000
Priority: 6
Page Num: 0003

-----UNFUNDED-----				
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 3:	MON	Recurring	5.00	0.20
Year 4:	MON	Recurring	5.00	0.20
Total:			=====	=====
			10.00	0.40

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : EXCL (CATEGORICAL EXCLUSION)

Explanation: 516 DM2 App. 2, 1.6

Project Statement
Last Update: 03/08/96
Initial Proposal: 1996

NABR-N-004.000
Priority: 8
Page Num: 0001

Title : REMOTE SENSING NEEDS

Funding Status: Funded: 0.00 Unfunded: 38.00

Servicewide Issues : N17 (BIODIVERSITY)
N20 (BASELINE DATA)

Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Natural Bridges National Monument has color aerial photographs from 1977 at the scale of 1:60,000. This information shows the Monument and the surrounding areas in detail, particularly numerous human impacts (roads, oil exploration and development activity) outside of the Monument. Impacts in the Monument are not readily evident given the altitude of the photography. The photographs are nearly twenty years old and do not reflect continued developmental activities, either in the Monument or on adjacent lands. Advances in technology have improved the suitability of aerial photography and remote sensing, making these technologies a cost effective and accurate means of mapping. The Monument will be receiving GIS support from the Southeast Utah Group beginning in 1994.

The Resource Management staff of the Southeast Utah Group needs to investigate further applications and technological developments in remote sensing to adequately assess the use of those developments in the management and evaluation of the Monument's natural resources. This would likely be accomplished through contact with the US Forest Service Geomtronics Laboratory in Salt Lake City or through the University of Utah, Geography Department's Digit Lab.

Description of Recommended Project or Activity

The Monument needs to acquire current aerial photography. This should include updated high altitude photography, low level video imaging and possibly infra-red aerial photography. Investigation into the use of satellite sensing such as the application of SPOT technology for use with the GIS should be investigated.

Last Update: 03/08/96
Initial Proposal: 1996

Project Statement

NABR-N-004.000
Priority: 8
Page Num: 0002

BUDGET AND FTEs:

		-----FUNDED-----		
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
			=====	=====
		Total:	0.00	0.00
		-----UNFUNDED-----		
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	MON	One-time	25.00	0.10
Year 2:	MON	One-time	5.00	0.00
Year 3:	MON	One-time	3.00	0.00
Year 4:	MON	One-time	5.00	0.00
			=====	=====
		Total:	38.00	0.10

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : EXCL (CATEGORICAL EXCLUSION)

Explanation: 516 DM2 App. 2, 1.6

Last Update: 03/08/96
Initial Proposal: 1996

Project Statement

NABR-N-005.000
Priority: 11
Page Num: 0001

Title : HAZARDOUS MATERIALS SPILL RESPONSE PLAN

Funding Status: Funded: 0.00 Unfunded: 15.00

Servicewide Issues : N16 (NEAR-PARK DEV)
N20 (BASELINE DATA)

Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Natural Bridges National Monument is located adjacent to the only major surface transportation route in the area, Utah Highway 95. While most of the traffic on this road is recreational, some of the use is industrial traffic and includes large trucks transporting hazardous materials. Utah Highway 95 crosses or intersects numerous drainages that enter White and Armstrong Canyons, the Monument's two major drainages. Any hazardous materials that might spill into the drainages above the Monument would drain into these canyons.

The Monument currently has no plan nor the equipment and expertise to deal with a hazardous materials spill. A petroleum products spill on the Yampa River in 1988 illustrates the need for planning and coordination. The public agencies involved were uncoordinated and jurisdictional responsibilities were unclear. The result was an ineffective control effort. This could be exacerbated at Natural Bridges National Monument by the remoteness of the area. The Monument needs to coordinate response planning with state, local, and federal agencies to effect a response plan. Monument resources and human health and safety are at risk.

Description of Recommended Project or Activity

The Monument needs to develop a coordinated Hazardous Spill Response Plan as part of an emergency operations plan. State, local, and federal agencies should be included in the development of the plan. The plan should outline containment and clean-up procedures, public safety concerns, outline a chain of command, define responsibilities, and assure coordination of response efforts. This plan should also contain a list of persons to be contacted in the event of a spill including their phone numbers. Information on various common hazardous materials subject to transport in the area should be included in the plan.

Last Update: 03/08/96
Initial Proposal: 1996

Project Statement

NABR-N-005.000
Priority: 11
Page Num: 0002

BUDGET AND FTEs:

		-----FUNDED-----		
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
			=====	=====
		Total:	0.00	0.00
		-----UNFUNDED-----		
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	ADM	One-time	15.00	0.30
			=====	=====
		Total:	15.00	0.30

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : EXCL (CATEGORICAL EXCLUSION)

Explanation: 516 DM2 App. 2, 1.6

Project Statement

Last Update: 03/08/96
Initial Proposal: 1994

NABR-N-006.000
Priority: 14
Page Num: 0001

Title : AIR RESOURCES PROGRAM MANAGEMENT

Funding Status: Funded: 6.00 Unfunded: 0.00

Servicewide Issues : N14 (AIR POLLUTION)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

The Monument is a Class II airshed as defined by the Clean Air Act as amended in 1977. Clean air and high visibility are integral Monument resources. Scenic vistas, including the topographic features of Monument Valley some 70 miles distant, are visible on nearly a daily basis. These topographic features include such nationally known structures as Navajo Mountain, Hoskinnini Mesa, Train Rock, and El Capitan. Since the construction of the Navajo and Four Corners power stations at Page, Arizona and Farmington, New Mexico respectively, there has been a noticeable decline in visibility and air quality.

From December 1978 until July 1989 the staff of Natural Bridges National Monument made observations of air quality and visibility and recorded the information on data sheets. The assessment was considered to be too subjective and was discontinued in favor of a more scientific data collection system being employed at neighboring parks.

These include an automatic camera and transmissometer at Canyonlands National Park (60 miles north), a continuous Ozone and Sulfur Dioxide gaseous monitoring and meteorological station at Arches National Park (90 miles northeast), a continuous Ozone and Sulfur Dioxide gaseous monitoring and Total Suspended Particulates monitoring and meteorological station at Colorado National Monument (110 miles northeast). Grand Canyon National Park (350 miles to the southwest) runs a full array of monitoring devices including a transmissometer, automatic camera, IMPROVE sampler, automated meteorological station, continuous Ozone and Sulfur Dioxide monitors, wet deposition monitor and a NDDN (National Dry Deposition Network) sampler.

A special study was conducted during the winter of 1987 to determine the effects of emissions from the Navajo generating station at Page, Arizona on regional visibility and general air quality. This was named the WHITEX (Winter Haze Intensive Tracer Experiment) Study. Acid deposition is being monitored at two locations in the southeast Utah area. These sites are part of the National Acid Deposition Program and are located at Bryce Canyon National Park and Green River, Utah. Data from the sites indicate an annual average pH of 5.2 which is typical for the western

Project Statement

Last Update: 03/08/96
Initial Proposal: 1994

NABR-N-006.000
Priority: 14
Page Num: 0002

United States and compares with a pH of 4.3 average for the NADP sites in the northeastern United States.

To assess the biological effects of air pollution, a survey of 10 Colorado Plateau parks was undertaken to establish baseline data on chlorophyll degradation levels and nitrogenase activity in soil crusts. Baseline information was also acquired on chlorophyll degradation and electrolyte leakage in the rock lichen *Rhizoplaca melanophthalma*. Natural Bridges National Monument was one of the 10 parks included in this study. Little information is available on acid deposition either at Natural Bridges National Monument or at any of the other National Parks on the Colorado Plateau at this time.

Non-natural sources of air pollution at Natural Bridges National Monument are attributed to local, regional, national, and international sources. These include sources such as metropolitan and industrial areas throughout the southwest and as far away as Los Angeles, Denver, and the Gulf coast. The power stations at Page, Arizona and Farmington, New Mexico are probably major contributors to air quality degradation. Local sources that may also be important contributors are prescribed fire, wood smoke from domestic sources, exhaust from the diesel generators, and dust from human activities in the area. Several attempts have been made to permit toxic incinerators in the region and these could have a serious impact on air quality. Due to the reasonably clear condition of the air and the arid environment, any activity that causes air quality degradation will have noticeable effects.

Description of Recommended Project or Activity

It is desirable to have air quality information specific to Natural Bridges National Monument, but the small size of the park and the proximity of other National Park Service units on the Colorado Plateau make it difficult to justify the expense of monitoring on an extensive scale at one small area. Past attempts at monitoring were too subjective to be useful. The Monument should continue to participate in monitoring biological effects to gather baseline information. This would be carried out by the Resource Management Division of the Southeast Utah Group as part of a study integrated with other parks on the Colorado Plateau.

Last Update: 03/08/96
Initial Proposal: 1994

Project Statement

NABR-N-006.000
Priority: 14
Page Num: 0003

BUDGET AND FTEs:

		-----FUNDED-----			
	Source	Activity	Fund Type	Budget (\$1000s)	FTEs
1994:	PKBASE-NR	MON	Recurring	1.50	0.10
1995:	PKBASE-NR	MON	Recurring	1.50	0.10
1996:	PKBASE-NR	MON	Recurring	1.50	0.10
1997:	PKBASE-NR	MON	Recurring	1.50	0.10
Total:				=====	=====
				6.00	0.40

		-----UNFUNDED-----			
	Activity	Fund Type	Budget (\$1000s)	FTEs	
Total:				=====	=====
				0.00	0.00

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : EXCL (CATEGORICAL EXCLUSION)

Explanation: 516 DM2 App. 2, 1.7

Project Statement

NABR-N-007.000

Last Update: 03/08/96
Initial Proposal: 1994

Priority: 3
Page Num: 0001

Title : SURFACE WATER RESOURCE MANAGEMENT

Funding Status: Funded: 9.00 Unfunded: 0.00

Servicewide Issues : N11 (WATER QUAL-EXT)
Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Water resources are the key constituents influencing all natural systems especially in the desert environment. The watershed of Natural Bridges National Monument consists of several well developed canyons, two major canyons - Armstrong and White, and four smaller tributary canyons, Tuwa, To-Ko-Chi, Burch, and Deer Canyons. All of these canyons are deeply incised into the Cedar Mesa sandstone to depths of up to 600 feet. None of the headwaters of these canyons are within the current Monument boundaries so there is potential impact to the water resources from anthropogenic activities on adjacent lands. Grazing is the major land use outside the Monument, with past mining activity having occurred within the Monument watershed. Some oil and gas exploration has occurred within the area and an exploratory well was drilled within one mile of the boundary of the Monument. While this well was unproductive, it was improperly plugged and resulted in brine seepage to the surface resulting in localized destruction of vegetation. This well was properly plugged and abandoned in 1985. Springs, seeps, and unique hanging garden plant communities are subject to adverse effect due to potential drawdown of the aquifer to support ground water wells for human and livestock use. Riparian and hanging gardens are considered to be wetlands and are subject to Federal wetland protection guidelines.

The Resource Management Division of the Southeast Utah Group is currently monitoring the chemical and physical parameters of five springs and seeps in the Monument twice a year. These are Horsecollar Seep, Kachina Bridge seep, Owachamo Bridge Seep, Sipapu Bridge seep and To-Ko-Chi Canyon spring. The following physical and chemical parameters are monitored: water temperature, water flow, pH, dissolved oxygen, specific conductance, copper, nitrate, sulfate, manganese, iron, phosphate, alkalinity, hardness and chloride. Data have been collected for the past seven years as part of the inventory and monitoring program.

Last Update: 03/08/96
Initial Proposal: 1994

Project Statement

NABR-N-007.000
Priority: 3
Page Num: 0002

Description of Recommended Project or Activity

The Resource Management Division of the Southeast Utah Group will continue to monitor the chemical and physical parameters of the five springs and seeps as part of the inventory and monitoring program. No changes in this program are anticipated and funding will continue to be provided for from base funding.

BUDGET AND FTEs:

Source		Activity	FUND Type	Budget (\$1000s)	FTEs
1994:	PKBASE-NR	MON	?	2.00	0.10
1995:	PKBASE-NR	MON	?	2.00	0.10
1996:	PKBASE-NR	MON	?	2.50	0.10
1997:	PKBASE-NR	MON	?	2.50	0.10
Total:				9.00	0.40

Activity		FUND Type	Budget (\$1000s)	FTEs
Total:			0.00	0.00

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : EXCL (CATEGORICAL EXCLUSION)

Explanation: 516 DM2 App. 2, 1.6

Project Statement
Last Update: 03/08/96
Initial Proposal: 1994

NABR-N-008.000
Priority: 2
Page Num: 0001

Title : INVENTORY AND MONITORING PROGRAM MANAGEMENT

Funding Status: Funded: 41.00 Unfunded: 0.00

Servicewide Issues : N17 (BIODIVERSITY)
N20 (BASELINE DATA)

Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

The Southeast Utah Group, Resource Management Division has a well developed inventory and monitoring program which includes a substantial amount of work at Natural Bridges National Monument. The program was initiated in 1985 and has grown to include all biotic resources.

In 1985 research was initiated into the status of small mammal populations with the establishment of small mammal trapping webs on the mesa top between White and Armstrong Canyons. The trap design is based on the technique of Anderson et al. 1983. Other trapping efforts have been accomplished for various other habitats in the Monument as follows: during 1987, 1988, and 1989 small mammal trap lines were run in White Canyon above Sipapu Bridge, in 1987 a single trapping effort was carried out in isolated pockets of Douglas fir (*Pseudotsuga menziesii*), and in 1985 a single trapping effort utilizing a modified grid was accomplished in the residence area near the sewage lagoon. The current inventory and monitoring program is limited to small mammals with nothing larger than pack rats (*Neotoma*) being monitored.

Since 1985 transect data has been obtained in three vegetation communities in the Monument. These are the Pinyon-Juniper, riparian and rimrock vegetation communities. In 1987 the inventory and monitoring for vegetation was expanded to its current level of five 20 plot nested frequency cover transects.

Limited surveys of herpetofauna have been undertaken in the Pinyon-Juniper and Riparian Communities in the Monument from 1987-1990. The surveys were run primarily in transect form. Pitfall arrays were run in 1985 near the sewage lagoon and residence area. In 1989 pitfall arrays were run in White Canyon above Sipapu Bridge. In 1990 a herpetofauna list of potential species was developed for the Monument.

Avifauna are monitored annually by transect. The transects are one kilometer long and are run for two to three days. Two each are executed in the Pinyon-Juniper and Riparian communities. The Pinyon-Juniper transects are 60 meters wide and the Riparian are

Project Statement

NABR-N-008.000

Last Update: 03/08/96
Initial Proposal: 1994

Priority: 2
Page Num: 0002

30 meters wide. Spot surveys have been accomplished sporadically in the Douglas fir habitat.

Description of Recommended Project or Activity

The Southeast Utah Group has been committed to the inventory and monitoring program for the past ten years. As inventory and monitoring is gaining renewed interest in the National Park Service, the Southeast Utah Group has been a pioneer and an example to be emulated. Inventory of park resources is critical as it is impossible to manage resources for which there is no information. Monitoring is an extension of inventory that provides a picture of changes due to a wide variety of factors or combination of factors. More importantly, it is an early warning system for internal and external derogations and allows management to make informed decisions and to react in a timely manner. For this reason it is essential to continue the inventory and monitoring of Natural Bridges National Monument at its current level.

BUDGET AND FTEs:

-----FUNDED-----					
	Source	Activity	Fund Type	Budget (\$1000s)	FTEs
1994:	PKBASE-NR	MON	?	8.00	0.50
1995:	PKBASE-NR	MON	?	11.00	0.60
1996:	PKBASE-NR	MON	?	11.00	0.60
1997:	PKBASE-NR	MON	?	11.00	0.60
Total:				41.00	2.30
-----UNFUNDED-----					
		Activity	Fund Type	Budget (\$1000s)	FTEs
Total:				0.00	0.00

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Project Statement

Last Update: 03/08/96
Initial Proposal: 1994

NABR-N-008.000
Priority: 2
Page Num: 0003

Compliance codes : EXCL (CATEGORICAL EXCLUSION)

Explanation: 516 DM2 App. 2, 1.6

Last Update: 03/08/96
Initial Proposal: 1996

Project Statement

NABR-N-014.000
Priority: 7
Page Num: 0004

existing (or changing) resource base and to determine change in biotic systems in historic time.

BUDGET AND FTEs:

-----FUNDED-----				
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
			=====	=====
Total:			0.00	0.00
-----UNFUNDED-----				
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	RES	One-time	25.00	0.10
Year 2:	RES	One-time	25.00	0.10
Year 3:	RES	One-time	25.00	0.10
Year 4:	RES	One-time	25.00	0.10
Total:			=====	=====
			100.00	0.40

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : EXCL (CATEGORICAL EXCLUSION)

Explanation: 516 DM2 App. 2, 1.6

Last Update: 03/08/96
Initial Proposal: 1996

Project Statement

NABR-N-009.000
Priority: 5
Page Num: 0001

Title : INVERTEBRATES AND SOIL MICROFLORA STUDY

Funding Status: Funded: 0.00 Unfunded: 60.00

Servicewide Issues : N17 (BIODIVERSITY)
N20 (BASELINE DATA)

Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Although small and often unseen, invertebrates and microorganisms make up the bulk of species found in the Monument. They are an essential part of many ecosystem processes such as nutrient cycling and decomposition. Some are critical in the life cycle of vascular plants, providing many services such as pollination and dispersal, and enhancing nutrient and water uptake. Some act to stabilize soils. All provide food for other forms of life. Without these organisms, basic ecosystem processes would no longer function.

Unfortunately, we know very little about the composition or functioning of these communities. Without this baseline information, human impacts cannot be assessed nor can change in these systems be detected. This greatly hampers effective management of any ecosystems in the Monument, as impacts or changes to these smaller systems can often result in the serious disruption of larger ecosystems. We need to understand what smaller organisms are present in the different ecosystems, and the role they play in the habitats in which they are found.

Description of Recommended Project or Activity

Inventories need to be done of terrestrial and aquatic invertebrates and soil microfauna. The role of these organisms in the habitats in which they occur needs to be identified and documented. Examples of this would be plant-herbivore interactions, pollinator and disperser relationships, their role in vascular plant establishment and survival, and in nutrient and decomposer cycles.

Last Update: 03/08/96
Initial Proposal: 1996

Project Statement

NABR-N-009.000
Priority: 5
Page Num: 0002

BUDGET AND FTEs:

		-----FUNDED-----		
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
			=====	=====
Total:			0.00	0.00

		-----UNFUNDED-----		
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	RES	One-time	15.00	0.30
Year 2:	RES	One-time	15.00	0.30
Year 3:	RES	One-time	15.00	0.30
Year 4:	RES	One-time	15.00	0.30
			=====	=====
Total:			60.00	1.20

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : EXCL (CATEGORICAL EXCLUSION)

Explanation: 516 DM2 App. 2, 1.6

Last Update: 03/08/96
Initial Proposal: 1996

Project Statement

NABR-N-010.000
Priority: 10
Page Num: 0001

Title : CYANOBACTERIAL-LICHENMOSS SOIL CRUSTS

Funding Status: Funded: 0.00 Unfunded: 40.00

Servicewide Issues : N17 (BIODIVERSITY)
N20 (BASELINE DATA)

Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Cyanobacterial-lichen-moss soil crusts represent up to 70% of the living ground cover in the Monument. It has been shown that these crusts act to bind soil particles together, thus increasing soil stability. It is thought that these crusts increase rainfall infiltration and reduce sediment production and runoff. Also, it has been postulated that they aid in the establishment of vascular plants, as well as enhancing nutrient and water availability for these plants.

It is essential that the role these crusts play in the Monument ecosystem be better understood. Without this understanding, effective management of this vast resource, and systems they occur in, will be impossible. Also, this understanding will facilitate use of these crusts in park projects such as plant reclamation efforts and stabilization of surface.

Description of Recommended Project or Activity

Three types of studies need to be funded. These would address the major roles ascribed to these crusts.

A. Hydrology: Studies examining the relationship between types of crust, substrate type, topography, and rainfall events need to be carried out to better understand their function in hydrologic events.

B. Vascular plant establishment: Establishment of vascular plants in the desert is always problematic, and understanding the role that crusts play in this is essential for understanding systems' functioning as well as effective management of disturbances.

C. Nutrient relationships: The relationship between crusts and nutrient availability and uptake in vascular plants is very important, as it influences survival of individuals and species, and affects vascular plant community composition.

Last Update: 03/08/96
Initial Proposal: 1996

Project Statement

NABR-N-010.000
Priority: 10
Page Num: 0002

BUDGET AND FTES:

		-----FUNDED-----		
Source	Activity	Fund Type	Budget (\$1000s)	FTES
Total:			0.00	0.00

		-----UNFUNDED-----		
	Activity	Fund Type	Budget (\$1000s)	FTES
Year 1:	RES	One-time	10.00	0.20
Year 2:	RES	One-time	10.00	0.20
Year 3:	RES	One-time	10.00	0.20
Year 4:	RES	One-time	10.00	0.20
Total:			40.00	0.80

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : EXCL (CATEGORICAL EXCLUSION)

Explanation: 516 DM2 App. 2, 1.6

Last Update: 03/09/96
Initial Proposal: 1994

Project Statement

NABR-N-011.000
Priority: 4
Page Num: 0001

Title : WILDLIFE RESOURCES MANAGEMENT

Funding Status: Funded: 40.00 Unfunded: 20.00

Servicewide Issues : N17 (BIODIVERSITY)
N20 (BASELINE DATA)

Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Desert Bighorn Sheep

Desert Bighorn Sheep (*Ovis canadensis nelsoni*) were a resident of Natural Bridges National Monument until facilities were developed in the park in 1966. Road construction was probably a factor in the disappearance of the sheep, although it is unknown if that was the exact cause. Herds in San Juan County, Utah are currently experiencing a drastic decline due to disease, probably contracted from domestic sheep (*Ovis aries*). While there is a significant amount of habitat in the area, only 2,500 acres of the Monument is considered to be habitat for bighorn sheep, and that habitat is marginal. Historically, bighorn sightings were of single rams who are known to roam over great distances. Natural Bridges is marginal habitat and at the edge of their range in southwest San Juan County. Reintroduction of Desert Bighorn Sheep has been proposed for the Monument, but has never been accomplished. Given the limited amount of habitat available for the sheep it is unlikely that a reintroduction effort aimed solely at the Monument could be successful. In spite of the decline of Desert Bighorn Sheep in the area, it is evident that they are reoccupying parts of their old range in White Canyon and have been sighted within three miles of the Monument. In an effort to increase available habitat the BLM is periodically constructing water catchments for bighorn sheep. Such efforts on adjacent BLM land may eventually result in a return of bighorn sheep to the Monument.

Raptors

A variety of raptors are reported from Natural Bridges National Monument and on any given day raptors can be easily observed. The Red-tailed hawk (*Buteo jamaicensis*) is undoubtedly the most common raptor followed closely by the Golden eagle (*Aquila chrysaetos*). Other raptors reported for the Monument are the Great-horned owl (*Bubo virginianus*), Northern harrier (*Circus cyaneus*), Peregrine falcon (*Falco peregrinus*), Prairie falcon (*F. mexicanus*), American kestrel (*F. sparverius*), and the Bald eagle (*Haliaeetus leucocephalus*). The Monument has had a single breeding pair of Peregrine falcons in the 1993, 1994, and 1995

breeding seasons, with a total of five young successfully fledged. The Turkey vulture (*Carhartes aura*) is ubiquitous to the area and is known to nest near Sipapu Bridge. Of the Bald eagle sightings in the Monument, many may, in fact, have been Golden eagles. Bald eagles do winter in southeastern Utah and have been recorded in the Monument on migration. It is unlikely they make much use of the Monument as it has little permanent water. Cooper's hawks (*Accipiter cooperii*) and Goshawks (*Accipiter gentilis*) are both common raptors in canyon bottoms with cottonwoods. Cooper's Hawks have nested in the Monument (1988). The Rough-legged hawk (*Buteo lagopus*) has not been reported in the Monument, but is known to winter in southern Utah. The Mexican spotted owl (*Strix occidentalis*) has not been observed within Natural Bridges, but is known to occur in similar habitat nearby.

Deer and Elk

Mule Deer (*Odocoileus hemionus*) are numerous in the Monument both in the canyon bottoms and on the mesa top. The Mule Deer population has had serious fluctuations in recent years. The population is now considered to be stable in the area. Most deer use of the Monument and surrounding area is as winter range. While there are some deer inhabiting the canyon bottoms year-round, the majority of the deer migrate from the southern portion of Elk Ridge to winter in and near the Monument. The major browse species utilized as winter food is big sagebrush (*Artemisia tridentata*) with lessor use of Utah serviceberry (*Amelanchier utahensis*) and Mountain mahogany (*Cercocarpus montanus*).

The Utah Division of Wildlife Resources has released 50 elk (*Cervus elaphus*) on Elk Ridge near the Monument in an effort to reestablish elk in habitat they formerly occupied. In the past several years this herd has greatly increased in size. One of the cows was radio collared and was tracked in Burch Canyon which extends into the Monument and forms White Canyon. While elk have not been seen in the Monument, it is possible that they have wandered into the upper part of White Canyon. They have been seen along highway 95 within a mile of the Monument turnoff (one was struck by a car and killed in 1995) and Monument staff have observed them in winter along Highway 261 near Grand Gulch. It is anticipated that the elk will move higher into the Abajo Mountains and only return to the Bears Ears area during unusually hard winters. Past experience with transplant elk populations shows that they tend to wander for a while before selecting a home range.

UDWR Game Bird Releases

The State Division of Wildlife Resources has also been involved in introduction of Chuckar (*Alectoris chukar*), an exotic game bird. They are known to exist in Red Canyon southwest of the Monument and are not likely to expand into the Natural Bridges area as they prefer grassland and shrub vegetation types rather

Last Update: 03/09/96
Initial Proposal: 1994

Priority: 4
Page Num: 0003

than the Pinyon-Juniper vegetation common to Natural Bridges. The UDWR has also released turkey (*Meleagris gallopavo*) into the area near Comb Wash, 20 miles to the east and South Elk Ridge five miles to the northwest. Turkey were originally occupants and their remains are found in archeological sites. However, some of the turkeys that were released in Comb Wash are of an exotic subspecies, (Rio Grande) as opposed to the native subspecies, Merriam's. It does not seem likely that the Comb Wash turkeys will invade the Monument. It is possible that if those released on South Elk Ridge become a successful population that they may expand into the Monument.

Predators

Natural Bridges National Monument has a typical compliment of southeast Utah predators such as black bear (*Ursus americanus*), mountain lion (*Felis concolor*), coyote (*Canis latrans*), bobcat (*F. rufus*) and gray fox (*Urocyon cinereoargenteus*). Ringtail (*Bassariscus astutus*) have not been reported from the Monument, but are common in the adjacent Grand Gulch Wilderness Area where they are reported to be an aggressive nuisance. Predators are only occasionally sighted and little is known about them. Due to the small size of the Monument, it is unlikely that any of these species resides solely within the Monument and are therefore subject to legal hunting outside of the Monument. The UDWR reports that the legal bear harvest in the management unit that includes Natural Bridges National Monument was 18 in 1989. Bears have been killed near the Monument both in Deer Canyon and Burch Canyon, both of which drain into White Canyon inside the Monument. One bear was observed on the loop road in the fall of 1988 one was observed in the summer of 1992.

Herptofauna

Reptiles and amphibians are an important faunal component that is generally neglected by land management agencies. Natural Bridges National Monument has one of the easternmost records of the Utah Night Lizard (*Xantusia vigilis utahensis*), a subspecies endemic to the area between Natural Bridges and the Henry Mountains. Riparian habitat is valuable for isolated populations of the Tiger Salamander (*Ambystoma tigrinum*), canyon treefrog (*Hyla arenicolor*), and leopard frog (*Rana pipiens*). As well, Natural Bridges may harbor three species of spadefoot toad (*Scaphiopus* sp.), and the area could be important for evolutionary studies of this genus as interbreeding of these species has been documented. A sizable population of a stunted variety of prairie rattlesnake inhabits the Monument as well as Gopher snakes and several other species.

Last Update: 03/09/96
Initial Proposal: 1994

Project Statement

NABR-N-011.000
Priority: 4
Page Num: 0004

Description of Recommended Project or Activity

Desert Bighorn Sheep

Since insufficient habitat exists in the Monument to support a population of Desert Bighorn sheep it is not necessary to pursue a reintroduction effort solely for the purpose of establishing sheep in the Monument. Sheep exist outside of the Monument, but appear to be declining due to an unidentified disease. It is recognized by most wildlife managers that Desert Bighorn sheep are a regional resource and must be jointly managed by all public agencies having sheep habitat. Beginning in 1991, the National Park Service, State of Utah Department of Wildlife Resources, and the Bureau of Land Management began a planning effort to begin managing Desert Bighorn sheep jointly in southeast Utah. The immediate objective was to establish a census technique for accurately determining the size of the Bighorn population. An attempt is now underway to establish a research effort into the identity of the disease vector that has decimated some of the Bighorn herds in San Juan County, Utah. The final goal of the census and disease projects is to establish a methodology for removing surplus Desert Bighorn sheep to establish or augment sheep populations in formerly occupied habitat. This effort will eventually strengthen the sheep population in White Canyon and possibly result in the return of Desert Bighorn sheep to Natural Bridges. The cost of the involvement of the Southeast Utah Group Resource Management Division in this project that is transferable to Natural Bridges National Monument is \$1,000.

Raptors

Very little raptor work has been done at Natural Bridges National Monument. The Monument was surveyed in 1988 for Peregrine Falcons but none were found. Since then, Peregrines have established nesting territories within the Monument in 1993, 1994, and 1995. It is assumed they will continue to nest here in the future. Some raptors such as the American kestrel are known to nest in the Monument, but records of nesting territories are incomplete. The Monument needs to hire a seasonal to survey the Monument during nesting season to locate and document raptor nesting territories. This should be carried out for two years at a cost of \$5,000 per year. In 1995 money became available to begin a three year inventory of a candidate endangered species, the Mexican spotted owl. Projected costs for the owl project are \$2,000 per year for Natural Bridges.

Deer and Elk

Mule Deer are fairly common in the area and numbers in Natural Bridges seem typical. Elk have recently been reintroduced into the area and now have a rapidly expanding population. Elk have not been reported from the Monument, but have been documented in the upper portion of White Canyon by the Division of Wildlife Resources. It is probable that elk have been in the remote areas of the Monument. Documentation of elk occurrence in the Monument

Project Statement
Last Update: 03/09/96
Initial Proposal: 1994

NABR-N-011.000
Priority: 4
Page Num: 0005

is needed, but should not require additional funds or personnel.

UDWR Game Bird Releases

The game birds released by the Utah Division of Wildlife Resources have not been reported from the Monument. Monument staff should remain vigilant for the occurrence of such exotic wildlife and report it to the SEUG Resource Management Division as soon as they are observed. Once these exotic game birds are discovered it will be necessary to monitor their presence to determine if they establish breeding territories in the Monument.

If these game birds do become permanent residents of the Monument, a monitoring program will need to be established to determine their impact.

Predators

Little information is available on the predators in Natural Bridges National Monument. While the Monument is small and most predators occurring in the Monument probably rely on outside lands to a great degree to meet their habitat needs, a study of the predators utilizing Natural Bridges National Monument should be considered as part of a broader study of predators on National Park Service lands in southeast Utah. \$5,000 a year for a period of three years are needed to cover the cost of including Natural Bridges in a larger research project.

Herptofauna

The need for baseline data on herptofauna of Natural Bridges is discussed in Project Statement NABR-N-008 Inventory and Monitoring.

BUDGET AND FTEs:

		-----FUNDED-----			
	Source	Activity	Fund Type	Budget (\$1000s)	FTEs
1994:	PKBASE-NR	MON	Recurring	2.00	0.30
	PKBASE-NR	MON	Recurring	5.00	0.40
	RG-NS-RES	RES	One-time	5.00	0.10
	RG-NS-RES	MON	Recurring	2.00	0.10
		Subtotal:		14.00	0.90
1995:	PKBASE-NR	MON	Recurring	2.00	0.30
	PKBASE-NR	MON	Recurring	5.00	0.40
	RG-NS-RES	RES	One-time	5.00	0.10
	RG-NS-RES	MON	Recurring	2.00	0.10
		Subtotal:		14.00	0.90

Last Update: 03/09/96
Initial Proposal: 1994

Project Statement

NABR-N-011.000
Priority: 4
Page Num: 0006

1996:	PKBASE-NR MON	Recurring	2.50	0.30
	RG-NS-RES RES	One-time	5.00	0.10
	RG-NS-RES MON	Recurring	2.00	0.10

		Subtotal:	9.50	0.50
1997:	PKBASE-NR MON	Recurring	2.50	0.30
			=====	
		Total:	40.00	2.60

-----UNFUNDED-----				
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 3:	PRO	One-time	5.00	0.25
	RES	One-time	5.00	0.25

		Subtotal:	10.00	0.50
Year 4:	PRO	One-time	5.00	0.25
	RES	One-time	5.00	0.35

		Subtotal:	10.00	0.60
			=====	
		Total:	20.00	1.10

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : EXCL (CATEGORICAL EXCLUSION)

Explanation: 516 DM2 App. 2, 1.6

Project Statement
Last Update: 03/08/96
Initial Proposal: 1996

NABR-N-012.000
Priority: 9
Page Num: 0001

Title : THREATENED, ENDANGERED AND SENSITIVE SPECIES

Funding Status: Funded: 0.00 Unfunded: 18.00

Servicewide Issues : N17 (BIODIVERSITY)
N02 (T&E ANIMAL)

Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

The Federal list of "Endangered and Threatened Wildlife and Plants" lists two endangered wildlife species that are known to occur in Natural Bridges National Monument: the Peregrine falcon (*Falco peregrinus*) and the Bald eagle (*Haliaeetus leucocephalus*). Several sightings of these two birds are recorded in the wildlife observation files as well as documentation of nesting within the Monument for the Peregrine falcon. Three other bird species that may occur in the Monument are listed as candidate species: the Ferruginous hawk (*Buteo regalis*), the White-faced ibis (*Plegadis chihi*) and the Mexican Spotted owl (*Strix occidentalis*). The White-faced ibis was recorded in the Monument in 1990. Neither of the other two species are recorded in the wildlife observation files. However, Mexican Spotted owls have been recorded in similar habitat in nearby. One sighting of the Ferruginous hawk is recorded for the Green River in Canyonlands National Park and another has been sighted just to the west of the Needles District of Canyonlands.

The Kachina daisy (*Erigeron kachinensis*) a candidate for endangered status occurs in numerous locations throughout the Monument. Natural Bridges National Monument is the type locality for the Kachina daisy as well as four other species of rare plant: the Alcove Death camas (*Zigadenus vaginatus*), (*Aletes maddouglii radiatus*), no common name, (*Haplopappus scopulorum*) no common name, the Monument milkvetch (*Astragalus monumental*) formerly a candidate for threatened status. An initial survey of the Kachina daisy was initiated in 1985 with monitoring conducted in 1988 and 1989. In 1990 an extensive search for populations of Kachina daisy was accomplished in the Monument with quantification of four populations resulting.

Species listed as sensitive by the State of Utah which occurs or are likely to occur in the Monument include: Red bat (*Lasiurus cinereus*), Spotted bat (*Euderma maculatum*), Big Free-tailed bat (*Tadarida macrotis*), Desert shrew (*Notiosorex crawfordi*), Spotted Ground squirrel (*Spermophilus spilosoma*), Abert's squirrel (*Sciurus aberti*), Mountain plover (*Charadrius montanus*), Western bluebird (*Sialia mexicana*), Ferruginous hawk, Swainson's hawk (*B. swainsoni*), Bell's vireo (*Vireo belli*), Mexican Spotted owl,

Project Statement

NABR-N-012.000

Last Update: 03/08/96
Initial Proposal: 1996

Priority: 9
Page Num: 0002

White-faced ibis and the Plateau whiptail (*Cnemidophorus velox*). The status of the Great Blue heron (*Ardea herodias*) is considered questionable in the State of Utah.

No Federally listed taxon of mammal, reptile, amphibian, insect, crustacean, fish or mollusc are known to occur in the Monument.

Three species of mammal are considered to be extirpated from the Monument. These are the Grizzly bear (*Ursus arctos horribilis*), the Desert Bighorn sheep (*Ovis canadensis*) and the Timber wolf (*Canis lupus*). The State of Utah considers the Grizzly bear and the Timber wolf to be extirpated from the Abajo Mountains/Elk Ridge area just north of the Monument, but no records exist proving that they occurred in the Monument.

Information on the status of the species mentioned above is incomplete at best. While Peregrines have been identified as nesting within the Monument in recent years, Bald eagles are likely to be transient in the Monument due to the lack of suitable habitat.

Description of Recommended Project or Activity

The Kachina Daisy is the only sensitive species that is adequately monitored at present. Information should be obtained on a number of sensitive plant species that may exist in the Monument. Some of this information may be found through the normal inventory and monitoring program but almost no information on the habitat requirements or population dynamics are available. Knowledge about these species will probably be obtained only by direct effort to locate and study the individual species. \$2,000 per year are needed to monitor sensitive plants at Natural Bridges.

Spotted Owl monitoring should begin in 1993 as NRPP money has been allocated for this project. Since Spotted Owls occur in the Abajo Mountains (Twelve miles east) part of the effort for the Southeast Utah Group should be directed toward Natural Bridges. An estimate of \$2,000 per year for three years is needed. A spinoff benefit on this project is that additional information on other owl species can be obtained.

Monitoring for Peregrine Falcons should continue. Funding will come from base funds for the Resource Management Division of the Southeast Utah Group. The cost of this monitoring program will be \$500 per year.

Monitoring of the various State listed sensitive species and monitoring of any candidate species to the Federal Endangered Species list will be accomplished through base funds for the Resource Management Division of the Southeast Utah Group. This will cost \$500 per year.

Last Update: 03/08/96
Initial Proposal: 1996

Project Statement

NABR-N-012.000
Priority: 9
Page Num: 0003

BUDGET AND FTEs:

-----FUNDED-----				
Source	Activity	Fund Type	Budget (\$1000s)	FTEs
Total:			0.00	0.00
-----UNFUNDED-----				
	Activity	Fund Type	Budget (\$1000s)	FTEs
Year 1:	MON	Recurring	2.00	0.10
	MON	Recurring	2.00	0.10
	MON	Recurring	0.50	0.10
	MON	Recurring	0.50	0.10
Subtotal:			5.00	0.40
Year 2:	MON	Recurring	2.00	0.10
	MON	Recurring	2.00	0.10
	MON	Recurring	0.50	0.10
	MON	Recurring	0.50	0.10
Subtotal:			5.00	0.40
Year 3:	MON	Recurring	2.00	0.10
	MON	Recurring	2.00	0.10
	MON	Recurring	0.50	0.10
	MON	Recurring	0.50	0.10
Subtotal:			5.00	0.40
Year 4:	MON	Recurring	2.00	0.10
	MON	Recurring	0.50	0.10
	MON	Recurring	0.50	0.10
Subtotal:			3.00	0.30
Total:			18.00	1.50

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Compliance codes : ESA (ENDANGERED SPECIES ACT)
EA (ENV. ASSESSMENT)

Explanation:

Project Statement

NABR-N-013.000

Last Update: 03/08/96
Initial Proposal: 1994

Priority: 1
Page Num: 0001

Title : VEGETATION MNGT PROGRAM (FENCING, REVEG)

Funding Status: Funded: 9.50 Unfunded: 30.00

Servicewide Issues : N17 (BIODIVERSITY)
N05 (NON-NAT PLANTS)

Cultural Resource Type:
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

The vegetation of Natural Bridges National Monument is typical of the Cedar Mesa area of southeast Utah. Great expanses of Pinyon-Juniper pygmy forest predominate the higher ground. Steep canyons break the vegetation into several vegetal communities such as rimrock and riparian. The vegetation of Natural Bridges has been separated by ecologists into five distinct vegetation types: the Pinyon-Juniper community, riparian communities, hanging garden communities, the Douglas fir community, and the rimrock, a mixed, shrub-dominated community type.

Prior to the establishment of the Monument the area was heavily grazed by cattle. Since the Monument was established in 1908 and expanded in 1962, it has been protected from grazing, though being unfenced it has experienced livestock trespass. Cattle trespass has had a measurable deleterious effect on vegetal resources of the Monument. While evidence of past grazing may be difficult to determine by transect analysis, there is an obvious aesthetic intrusion due to the presence of cattle dung which can persist for many years. Trampling by livestock destroys microbiotic soil crusts, and livestock consume grasses, forbs, and shrubs. The density of the Pinyon and Juniper on the mesa top may be influenced by 100 years of intensive grazing. The removal of grasses and forbs by livestock may have released Pinyon and Juniper from competition in the seedling stage and allowed them to increase to unnatural levels.

Boundary Fencing

Major fencing efforts in 1993, 1994, and 1995 have resulted in the majority of the needed fencing being completed. A one mile segment on the Monument's north boundary still needs to be completed to effectively exclude cattle from the Monument. The need to protect the Monument's resources through completion of this needed fencing project is the highest resource protection priority.

Disturbed Ground Revegetation

Recent road construction activities (1993-1995) have created

disturbed areas immediately adjacent to roads and bridge overlooks. These areas require immediate and on-going revegetation efforts to prevent aggressive invader and exotic plant species from dominating the landscape. In addition, years of trampling, off-trailing, and general use have nearly destroyed all ground vegetation within the campground. By employing barriers (such as boulder placement, low-profile rail and post fencing, and revegetation) this situation can be reversed.

Off-Trailing Ground Disturbance

The Monument has three major trails that lead from parking areas to each of the three natural bridges. These trails receive extensive use and must be maintained on a regular basis. Currently, off-trailing is occurring at several places along the Kachina Bridge Trail due to the trail configuration and missing rock steps. Besides safety considerations, because of these trail inadequacies resource damage is occurring as vegetation is being trampled and new trails created. By some relatively minor trail work involving some rerouting and replacement of tread surface, this problem can be alleviated.

Exotic Vegetation Control (see NABR-I-002, Integrated Pest Mngt)

Exotic plant control has been addressed in the project statement covering Integrated Pest Management. Continued attention to this work element is essential to preserve the integrity of the Monument's vegetal resources. Likewise rare and unique plants have been covered under the project statement concerning Threatened, Endangered and Sensitive species. As part of the Monument's basic resource inventory there is a need to update the parks vegetation map and to improve its accuracy. This will also provide better and more useful data for the Geographic Information System.

Description of Recommended Project or Activity

Boundary Fencing

In order to provide for the protection of the vegetal resources of Natural Bridges National Monument there is an immediate need to complete the fencing of a section of the north boundary of the Monument that was begun in 1994, but not completed (about a mile remains to be done). Trespass cattle entering from here are a threat to vegetation through direct consumption, and the trampling and creation of a seed bed for exotics, particularly tamarisk. The endemics to the Monument, such as the endangered Kachina Daisy, are concentrated in small specific habitats on the canyon rim and could be trampled and consumed by cattle. Cattle also pose a threat to surface water resources and archeologic resources.

Last Update: 03/08/96
Initial Proposal: 1994

Project Statement

NABR-N-013.000
Priority: 1
Page Num: 0003

Obviously, the best protection of the Monument's vegetation would be provided for by the fencing of the entire boundary, but this is neither practical nor even necessary. On much of the Monument's north and northwest boundary deep canyons just inside the Monument provide a natural barrier to cattle. Using this same strategy, the Monument was able to effectively safeguard its southeast boundary by working cooperatively with the BLM and a grazing lease holder to use the natural topography to its best advantage. By erecting a 0.4 mile fence on a finger of BLM land between two deep canyons, the Monument effectively excluded cattle from its southeast boundary and saved the materials, expense, and labor that would have been necessary to accomplish the same thing by building two miles of fence along the boundary.

Revegetation

Following road construction activities (1993-95), there are large areas of disturbed ground adjacent to roads and at pulloffs. To prevent aggressive invaders and exotic plants from taking over, an on-going revegetation program is needed to ensure success. Low-profile barrier fencing using native wood rail and post has been effective at protecting initial reseeding and revegetation efforts, but continued revegetation will be needed to respond to dieoffs and provide continuity.

Likewise, after years of trampling, off-trailing, and general overuse, the ground cover within the campground has been destroyed and an everwidening circle of damage is occurring beyond it. To adequately address this problem several steps must be taken: 1) Larger tent pads need to be constructed to replace the inadequately small ones that currently are not being used because many tents will not fit on them. 2) Rock and low-profile barrier fencing needs to be installed at several areas to prevent further vehicle and foot traffic damage to vegetation. 3) A revegetation program needs to be initiated to aid in the reestablishment of ground cover. 4) Appropriate signing and visitor compliance through enforcement needs to occur.

Trail Work

Some relatively minor trail work now can prevent a major problem from developing. Along the Kachina Bridge Trail some replacement of tread surface and rock steps and rerouting a small section of trail will prevent further vegetation degradation as visitors walk off trail to avoid hazardous travel.

Control of Exotic Vegetation

The third intervention needed to ensure protection of the Monument's vegetation is to continue an aggressive tamarisk control program. A tamarisk management plan has been written and provides an effective strategy for controlling tamarisk. Tamarisk infestations have been located and some control work has been undertaken. Continued aggressive action is needed to keep the tamarisk eliminated. This will be dependent on available

Last Update: 03/08/96
Initial Proposal: 1994

Project Statement

NABR-N-013.000
Priority: 1
Page Num: 0004

manpower, and the Monument is currently understaffed. Other exotics have invaded disturbed areas, but will not expand as long as more ground is not disturbed.

Vegetation Management Program

As the Southeast Utah Group now has a Geographic Information System, it is desirable to update the vegetation map for the Monument to provide more accurate and useable data.

A healthy Pinyon-Juniper ecosystem is necessary if the plants and animals of Natural Bridges are to survive, yet we don't know what ecosystem processes are required to maintain a healthy, functioning ecosystem. Research into the dynamics of the pinyon-juniper ecosystem, including processes that drive the natural system, responses to grazing, fire, and other environmental variables is needed. Reconstructions of pre-grazing vegetation communities is needed to provide managers with a basis for decisions concerning revegetation, fire management, wildlife management, etc.

BUDGET AND FTEs:

		-----FUNDED-----			
	Source	Activity	Fund Type	Budget (\$1000s)	FTEs
1994:	PKBASE-NR	MON	Recurring	2.00	0.10
1995:	PKBASE-NR	MON	Recurring	2.20	0.10
1996:	PKBASE-NR	MON	Recurring	2.50	0.10
1997:	PKBASE-NR	MON	Recurring	2.80	0.10
Total:				9.50	0.40

		-----UNFUNDED-----			
		Activity	Fund Type	Budget (\$1000s)	FTEs
Year 3:		RES	One-time	20.00	0.50
Year 4:		MON	Recurring	10.00	0.25
Total:				30.00	0.75

(Optional) Alternative Actions/Solutions and Impacts
(No information provided)

Last Update: 03/08/96
Initial Proposal: 1994

Project Statement

NABR-N-013.000
Priority: 1
Page Num: 0005

Compliance codes : EA. (ENV. ASSESSMENT)

Explanation:

Last Update: 03/08/96
Initial Proposal: 1996

Project Statement

NABR-N-014.000
Priority: 7
Page Num: 0001

Title : QUATERNARY RESOURCES

Funding Status: Funded: 0.00 Unfunded: 100.00

Servicewide Issues : N17 (BIODIVERSITY)
Cultural Resource Type: SITE (Archeological Site)
N-RMAP Program codes :

10-238 Package Number :

Problem Statement

Past archeological surveys have focused on the human occupation of the Cedar Mesa - Natural Bridges area. Some of these archeological surveys have produced information on paleontological resources, indicating that potentially rich paleontological resources exist in the monument as well.

One such survey discovered the bones of *Oreamos harringtoni* (Harrington's mountain goat) in a dry alcove shelter. These are the oldest directly dated extinct mountain goat remains at >39,800 yr B. P. (years before present). In addition, this is the first extinct mountain goat discovered in the United States outside of the Grand Canyon. Marmot remains were also recovered from this site.

Packrat middens from the same alcove containing spruce, limber pine, rose, and Douglas-fir confirm that these taxa were growing at the site during the late-Pleistocene. Limber pine, Douglas-fir, birch, and grasses were found to be major components in the dung pellets of extinct mountain goats residing near Natural Bridges.

These Quarternary Resources are irreplaceable and it is imperative that they are documented and monitored so that they may be protected from damage for investigation at a later date.

Description of Recommended Project or Activity

The potential for discovery of additional Quarternary resources in Natural Bridges National Monument is excellent. The extinct mountain goat find is significant, both biologically and chronologically, for it indicates that the Quarternary record in the Monument extends back beyond 40,000 years. The National Park Service should undertake efforts to recover information from the Monument as part of the Quarternary Research Program initiated by the Rocky Mountain Regional Office so that these resources can be documented and better managed.

Initial surveys should concentrate in White and Armstrong Canyons. White and Armstrong Canyons and their tributaries are prime locations for Quaternary research. The length, breadth, and depth of these canyons indicate that they are likely to contain significant Quaternary deposits. The alcoves located above the upper terraces are also excellent repositories. Pollen, mollusks, extinct animals, and paleo-Indian and Archaic occupation surfaces are likely to be found.

Side canyons also contain alluvium which can be mapped to determine past cut and fill episodes. Mapping of terraces would provide base line information on erosional patterns within these drainages. Radiocarbon dates on material within these alluvial sections will provide a chronographic sequence so that this information can be compared with other studies on the Plateau such as Salt Creek in Canyonlands, Tsegi Canyon on the Navajo Reservation, and canyons in Glen Canyon National Recreation Area. If charcoal lenses are documented, this information can possibly provide a wildfire history of the locale and evidence of human occupation (hearths) in the area.

Mollusks

Mollusks can provide high resolution data on local paleoenvironments because different species require very specific habitats to survive. Some snails live only in water, while others live only in grasslands or upon rocky substrates. The specific local environment can be determined by identifying which mollusks are present. During surveys of the alluvium in the canyons, mollusk deposits should be recorded. These deposits can latter be studied to answer specific questions on the local environment.

Pollen

Pollen deposits record both local and regional vegetation. For example, corn pollen will not transport far due to the structure of the pollen grain and it's dispersal mechanism. A signature of corn pollen within sediments would indicate that corn was cultivated in or transported to the location in which the pollen was found. On the other hand, pine pollen is wind transported and can represent a more regional pollen rain. Differences in pine pollen influx can indicate increases and decreases in pine trees in an area over time. Through the analysis of pollen within sediments, a more complete picture of past vegetation can be obtained. Pollen profiles taken from alluvial sections in either alcoves or arroyos can help to determine vegetation change. It is likely that pollen profiles taken within Natural Bridges will contain a good record of past vegetation.

Alcoves

As evidenced by the extinct mountain goat recovery, dry alcove sites are excellent repositories for Pleistocene faunal remains, packrat middens, and pollen. Alcoves also better preserve many of the deposits found in alluvium such as invertebrates (mollusks, insects) and faunal remains (bones, dung) because their interiors are protected from precipitation.

Bison Alcove in Arches National Park functioned as a raptor roost for at least 20,000 years. Packrat middens in the alcove contain numerous bones collected from rodents transported to the alcove by raptors. It is likely that similar alcoves also serve as raptor roosts. Alcoves should be surveyed to record potential resources and determine if they are in danger of disturbance by either natural processes or human use.

Packrat Middens

Packrat middens (nests) are excellent paleoenvironmental indicators because they record the environment immediately adjacent to the nesting site. Packrats are voracious collectors and will commonly collect and incorporate plants, dung, and bones into their nests. It is easy to radiocarbon date these discreet midden units to provide paleoenvironmental "snapshots" in time.

One of the middens at the mountain goat site is dated at least 23,000 years old indicating that an excellent record of packrat middens may be found in other protected alcoves within the Monument.

Isolated Populations

Isolated populations of ponderosa pine and Douglas-fir have been located in the Monument. These stands are growing below their normal elevational limits and are ecologically and geographically isolated from main populations growing at higher elevations on the Plateau. These stands warrant further study to determine if they are relict populations "left over" from the last ice age or if they are more recent arrivals. The ecology, history, composition, climatic parameters, and vulnerability of these stands are not known.

Climate

All of the above paleoenvironmental signatures can be used to help reconstruct past climatic regimes. One signature by itself is not necessarily a reliable indicator of past climate, but through comparison of different climatic proxy data (such as vegetation in packrat middens and mollusks in sediments) an hypothesis of past climate can be formed which can then be compared with regional climatic hypotheses. This information could contribute significantly to our understanding of global warming. Through documenting floral and faunal change in response to climatic change our understanding of biotic mechanisms will increase dramatically and provide us with background to help better manage these systems for which we are responsible.

Other Quaternary Resources

Additional alluvial, palynological, pedological, botanical, dendrochronological, and faunal resources are undoubtedly located within the Monument. Studies not yet undertaken include charcoal fire history, pollen profiles, and phytolith analysis. These paleoenvironmental records can be used as proxy data for climatic and biotic change over time. This information can, in turn, be used to test hypotheses on prehistoric human interaction with the

Active Filter: (No filter)

Output Selections:

Source types included: CULTURAL/INTEGRATED/NATURAL

Initial fiscal year: 1996

Include projects only if funding data entered

04/05/96

07:47:56

PROGRAMMING SHEET 1
CULTURAL/INTEGRATED/NATURAL
FUNDED ACTIVITIES
(\$ in thousands)

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES	SYSTEM- WIDE	FUNDING SOURCE	ACT TYP	T Y	CURRENT YEAR 1996	OUTY 19
			TYPE	ISSUE			P	\$ FTE	\$
008.000	COMPLIANCE		COMB	C70 C71	PKBASE-CR	PRO	R	20.00 0.33	20.0
009.000	SITE MONITORING AND MAINTENANCE		COMB	C06 C05	RG-CR-MTN	MON	C	10.00 0.20	.0
002.000	INTEGRATED PEST MGMT AND PROGRAMING		N05	N24	PKBASE-NR	MIT	R	3.50 0.20	4.0
001.000	EXTERNAL ISSUES MONITORING AND ASSESSMENT		N06	N24	PKBASE-NR	MON	R	9.00 0.30	10.0
002.000	EXTERNAL ISSUES OIL AND GAS DEVELOPMENT		N06	N24	PKBASE-NR	MON	R	4.00 0.10	14.0
003.000	WATER SYSTEM MANAGEMENT		N11		TEMP\$-NR	ADM	R	7.50 0.30	7.5
006.000	AIR RESOURCES PROGRAM MANAGEMENT		N14		PKBASE-NR	MON	R	1.50 0.10	1.5
007.000	SURFACE WATER RESOURCE MANAGEMENT		N11		PKBASE-NR	MON	?	2.50 0.10	2.5
008.000	INVENTORY AND MONITORING PROGRAM MANAGEMENT		N17	N20	PKBASE-NR	MON	?	11.00 0.60	11.0

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PROGRAMMING SHEET 1
CULTURAL/INTEGRATED/NATURAL
FUNDED ACTIVITIES
(\$ in thousands)

*PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES	SYSTEM- WIDE	FUNDING SOURCE	ACT TYP	T Y	CURRENT YEAR 1996	O FTE	OUTY \$
*011.000	WILDLIFE		N17	N20	PKBASE-NR	MON	R	2.50	0.30	2.5
*N	RESOURCES				RG-NS-RES	RES	O	5.00	0.10	.0
*	MANAGEMENT				RG-NS-RES	MON	R	2.00	0.10	.0
					Subtotal			9.50	0.50	2.5
*013.000	VEGETATION		N17	N05	PKBASE-NR	MON	R	2.50	0.10	2.8
*N	MNGT PROGRAM									
*	(FENCING, REVEG									
*	)									
*11 projects printed										
					Grand Total	\$ \$		81.00		
					Grand Total	FTE		2.83		

Active Filter: (No filter)

Output Selections:

Source types included: CULTURAL/INTEGRATED/NATURAL
Initial fiscal year: 1996
Sort by PROJECT within each park and type
Include projects only if funding data entered

04/05/96
07:49:28

PROGRAMMING SHEET 2
CULTURAL/INTEGRATED/NATURAL
UNFUNDED ACTIVITIES
(\$ in thousands)

PK	PROJECT	PROJECT TITLE	PKG	CULT	SYSTEM	ACT	T	CURRENT YEAR	OUTY		
PRI	NUMBER		NUM	RES	WIDE	TYP	Y	1996	19		
				TYPE	ISSUE		P	\$\$	FTE	\$	
0	2	001.000 COLLECTIONS		OBJC	C24	C46	RES	R	20.00	0.50	.0
		C MANAGEMENT									
0	11	002.000 MAINTAIN AND		OBJC	C45	C39	PRO	R	1.00	0.10	2.0
		C MONITOR EXHIBITS									
0	1	003.000 CULTURAL RESOURCE		SITE	C02	C10	RES	?	123.00	3.00	123.0
		C INVENTORY,									
		EVALUATION									
0	13	004.000 ROCK ART		SITE	C02	C71	MON	?	15.00	0.20	15.0
		C DOCUMENTATION									
0	14	005.000 ARCHIVES, ADMIN.,		OBJC	C37	C38	RES	O	30.00	1.00	.0
		C LEGISLATIVE									
		HISTORIES									
0	8	006.000 ETHNOGRAPHIC		ETHN	C21	C22	RES	R	32.00	1.00	25.0
		C PROGRAM									
0	9	007.000 CULTURAL SITE		SITE	C03	C10	RES	O	8.00	0.30	.0
		C INVENTORY					RES	R	.00	.00	1.0
				Subtotal					8.00	0.30	1.0
0	3	009.000 SITE MONITORING AND		COMB	C06	C05	MON	R	.00	.00	20.0
		C MAINTENANCE									
0	4	010.000 ARPA SITE PATROLS,		SITE	C07	C72	PRO	R	21.00	1.00	21.0
		C STAFF TRAINING									
0	6	011.000 INTERPRETATION OF		COMB	C80	C95	INT	R	15.00	0.50	15.0
		C CULTURAL RESOURCES									
0	5	012.000 SITE PROTECTION		SITE	C07	C71	PRO	C	20.00	0.50	20.0
		C									
0	2	013.000 DATA RECOVERY OF		SITE	C04		MIT	O	50.00	1.00	20.0
		C SITE 42SA18637									

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04/05/96
07:49:29

PROGRAMMING SHEET 2
CULTURAL/INTEGRATED/NATURAL
UNFUNDED ACTIVITIES
(\$ in thousands)

PK	PROJECT	PROJECT TITLE	PKG	CULT	SYSTEM	ACT	T	CURRENT YEAR	OUTY
PRI	NUMBER		NUM	RES	WIDE	TYP	Y	1996	19
				TYPE	ISSUE		P	\$\$	FTE
10	014.000	NAGPRA COMPLIANCE		OBJC	C46	C25	RES O	1.00	0.10
	C						RES R	.00	.00
								1.00	1.0

							Subtotal	1.00	0.10
								1.0	
2	001.000	GEOGRAPHIC		N20	N24	RES	R	10.00	0.10
	I	INFORMATION SYSTEM							10.0
		DEVELOPMENT							
1	002.000	INTEGRATED PEST		N05	N24	MON	R	.00	.00
	I	MGMT AND PROGRAMING				ADM	O	.00	.00
								.00	.0

							Subtotal	.00	.00
								.0	
6	003.000	WATER SYSTEM		N11		MON	R	.00	.00
	N	MANAGEMENT						.00	.0
8	004.000	REMOTE SENSING		N17	N20	MON	O	25.00	0.10
	N	NEEDS							5.0
1	005.000	HAZARDOUS MATERIALS		N16	N20	ADM	O	15.00	0.30
	N	SPILL RESPONSE PLAN							.0
5	009.000	INVERTEBRATES AND		N17	N20	RES	O	15.00	0.30
	N	SOIL MICROFLORA							15.0
		STUDY							
10	010.000	CYANOBACTERIAL-LICHE		N17	N20	RES	O	10.00	0.20
	N	NMOSS SOIL CRUSTS							10.0
4	011.000	WILDLIFE RESOURCES		N17	N20	PRO	O	.00	.00
	N	MANAGEMENT				RES	O	.00	.00
								.00	.0

							Subtotal	.00	.00
								.0	
9	012.000	THREATENED,		N17	N02	MON	R	5.00	0.40
	N	ENDANGERED AND							5.0
		SENSITIVE SPECIES							
1	013.000	VEGETATION MNGT		N17	N05	RES	O	.00	.00
	N	PROGRAM				MON	R	.00	.00
		(FENCING, REVEG)						.00	.0

							Subtotal	.00	.00
								.0	
7	014.000	QUATERNARY		SITE	N17	RES	O	25.00	0.10
	N	RESOURCES							25.0

PROGRAMMING SHEET 2
CULTURAL/INTEGRATED/NATURAL
UNFUNDED ACTIVITIES
(\$ in thousands)

PK	PROJECT	PROJECT TITLE	PKG	CULT	SYSTEM	ACT	T	CURRENT YEAR	OUTY
PRI	NUMBER		NUM	RES	WIDE	TYP	Y	1996	19
				TYPE	ISSUE		P	\$\$	FTE
24 projects printed									
Grand Total								\$\$	441.00
Grand Total								FTE	10.70

Active Filter: (No filter)

Output Selections:

Sorted by: Park + Resource Type
Years: All years
Show subtotal after change in Resource Type
Show grand total

04/05/96

ACCOMPLISHMENTS LIST

08:25:24

YEAR PROJECT NUMBER PROJECT TITLE

SUB-TITLE

1996 NABR-C-008.000 COMPLIANCE

1996 NABR-C-009.000 SITE MONITORING AND MAINTENANCE

Resource Type Sub-total-----

1995 NABR-I-002.000 INTEGRATED PEST MGMT AND PROGRAMING

1996 NABR-I-002.000 INTEGRATED PEST MGMT AND PROGRAMING

Resource Type Sub-total-----

1995 NABR-N-001.000 EXTERNAL ISSUES MONITORING AND ASSESSMENT

1996 NABR-N-001.000 EXTERNAL ISSUES MONITORING AND ASSESSMENT

1995 NABR-N-002.000 EXTERNAL ISSUES OIL AND GAS DEVELOPMENT

1996 NABR-N-002.000 EXTERNAL ISSUES OIL AND GAS DEVELOPMENT

1995 NABR-N-003.000 WATER SYSTEM MANAGEMENT

1996 NABR-N-003.000 WATER SYSTEM MANAGEMENT

1995 NABR-N-006.000 AIR RESOURCES PROGRAM MANAGEMENT

1996 NABR-N-006.000 AIR RESOURCES PROGRAM MANAGEMENT

1995 NABR-N-007.000 SURFACE WATER RESOURCE MANAGEMENT

1996 NABR-N-007.000 SURFACE WATER RESOURCE MANAGEMENT

1995 NABR-N-008.000 INVENTORY AND MONITORING PROGRAM MANAGEMENT

1996 NABR-N-008.000 INVENTORY AND MONITORING PROGRAM MANAGEMENT

1995 NABR-N-011.000 WILDLIFE RESOURCES MANAGEMENT

1996 NABR-N-011.000 WILDLIFE RESOURCES MANAGEMENT

1995 NABR-N-013.000 VEGETATION MNGT PROGRAM (FENCING, REVEG)

1996 NABR-N-013.000 VEGETATION MNGT PROGRAM (FENCING, REVEG)

Resource Type Sub-total-----

Grand Total=====

20 projects printed

Resource Management Projects - Annual Accomplishments Report

RMP Project Number: NABR-C-008.000

Title : COMPLIANCE

Servicewide Issues : C70 (ENVRM IMPCT)
 C71 (VISIT IMPCT)

Cultural Resource Type: COMB (Combination)

N-RMAP Program codes :

Description of Accomplishments

The archaeologist stationed in the Resource Management Division of the Southeast Utah Group will ensure the Monument remains in compliance with the National Historic Preservation Act, as well as other federal mandates such as the National Environmental Policy Act, the Native American Graves Protection and Repatriation Act, the Native American Religious Freedom Act, etc.

Plans for Next Cycle
 (No information provided)

Budget Information

Source	Activity	Fund Type	Budget (\$1000s)	FTEs
PKBASE-CR	PRO	Recurring	20.00	0.33

Total this year:			20.00	0.33
Total to date:			20.00	
Percent completed:			0%	

° TYPE OF NPS EMPLOYEE	° FTEs OF RESOURCES WORK		
	° Natural Cultural	Total	
°Research Scientists	0.0	0.0	0.0
°Resources Specialists	0.3	0.2	0.5
°025 Park Rangers Res Mgmt	0.1	0.1	0.2
°025 Park Rangers Res Prot	0.1	0.1	0.2
°025 Park Rangers Res Interp	0.1	0.1	0.2
°Maintenance Personnel	0.1	0.0	0.1
°Total of RES Personnel	0.7	0.5	1.2
°TOTAL PARK FTE: 11.0			
°PERCENT	6.4%	4.5%	10.9%