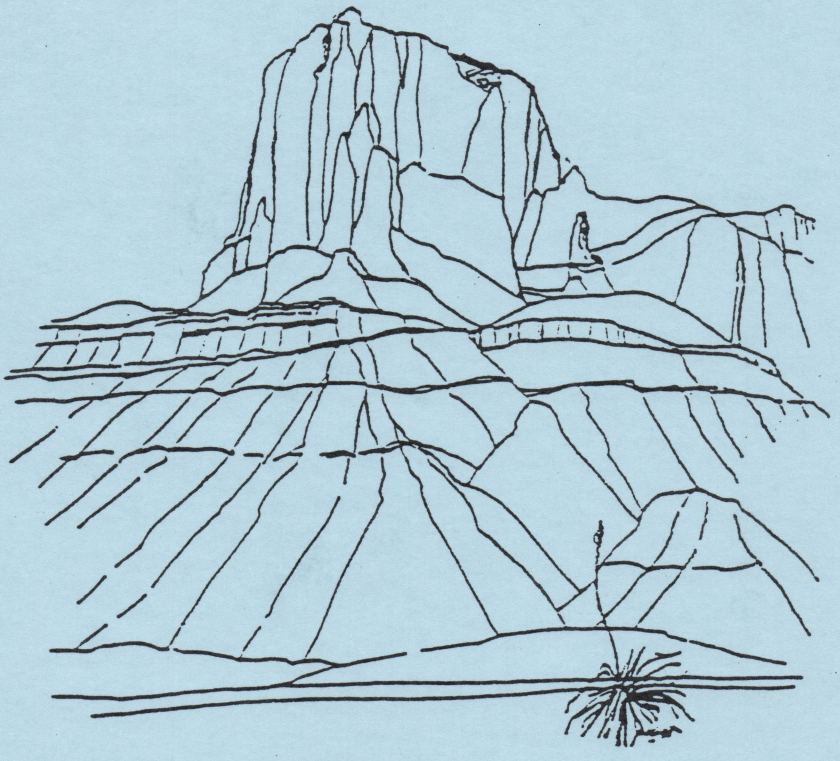
GUADALUPE MOUNTAINS NATIONAL PARK:



RESOURCES MANAGEMENT PLAN

1992

RESOURCES MANAGEMENT PLAN

FOR

GUADALUPE MOUNTAINS NATIONAL PARK

Recommended by: Larry Henderson
Superintendent, Guadalupe Mountains National Park

Oct 16, 1991
Date

Approved by
Regional Director
Southwest Region

April 17, 1992
Date

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III. INTRODUCTION:

Guadalupe Mountains National Park was authorized by Public Law 89-667, October 15, 1966, "to preserve in public ownership an area in the State of Texas possessing outstanding geological values together with scenic and other natural values of great significance." The park was formally established on September 30, 1972.

The purpose of the park is further delineated in the National Park Service Organic Act of 1916, as amended: "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." (Statement for Management, January , 1988).

LEGISLATION PERTAINING TO NATURAL RESOURCE MANAGEMENT:

The National Park Service Organic Act of August 25, 1916 established the NPS as the agency responsible for protecting the nation's park resources and providing for visitor enjoyment.

The Wilderness Act of September 3, 1964 (P.L. 88-577, Stat. 890). The park has 46,850 acres, designated by Congress as wilderness in 1978.

Public Law 89-667, October 15, 1966 which authorized Guadalupe Mountains National Park. Public Law 100-541, October, 1988 authorizing the addition of 10,123 acres.

The Clean Air Act, 1977, designated the park as a Class I air quality area. In Class I areas, the air is cleaner than that required by the National Ambient Air Quality Standards (NAAQS), and very little deterioration of air quality is allowed.

The 1978 Redwoods Act reemphasizes Congressional concern for all NPS system lands. No actions shall be taken in derogation of park values. (P.L. 95-250).

National Park Service (NPS) Management Policies (1988), other laws, executive orders, and general environmental legislation are found in the Statement for Management and in the appendix of this plan in the bibliography section (Legislation).

NATURAL RESOURCES:

The Guadalupe Mountains are nationally significant because of a combination of outstanding geologic, scientific, and scenic resources, including cultural and natural features unique to the American Southwest. The geology of the Guadalupes is internationally known. The park preserves an important portion of the Capitan Reef, one of the most extensive and significant non-coral fossil reefs in the world. This limestone reef formed in the seas of the Permian Age (250-280 million years ago) and was then uplifted to form a huge V-shaped plateau. The reef is important in tracing the origins of petroleum, potash, sulfur, gypsum, dolomite, and limestone.

The park consists of 86,503 acres of Chihuahuan Desert Plains, Canyons and uplifted Permian Age Reef. Three major biotic regions come together here; the Chihuahuan Desert, Rocky Mountains and Great Plains. Elevations range from 3650 feet to 8749 feet. There are over 900 identified species of plants, 56 species of reptiles and amphibians, 275 species of birds, 58 species of mammals, 25 known caves, 29 historic structures and 331 archeological sites. The park includes 46,850 acres of designated wilderness. The Wilderness Act of 1964 (P.L. 88-577) states that:

> A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain.

The National Park Service has a clear mandate to protect and preserve the natural and cultural resources of the lands it administers. This mandate sharply differentiates National Parks from other federal lands, which are managed for the production or perpetuation of preferred resources. The establishing legislation and management policies of the National Park Service decree that resources management programs should be directed towards preserving dynamic natural systems and processes, rather than individual components; i.e. no single resources should be managed to the benefit or detriment of another.

The major challenge of preserving park resources is derived from the threats that human use and activities present to this goal. In addition to the seemingly dichotomous mission of the National Park Service to both preserve and provide opportunities for public use of resources within the parks, these resources are being subjected to increasing threats and disruption from activities occurring outside park

boundaries. National Parks cannot be considered isolated islands, immune from outside interference; their fragility and ecological role within a local and regional context is becoming increasingly apparent.

The Resource Management Plan is one part of the park's General Management Plan, the primary document guiding the management of an individual park. The purpose of the Resource Management Plan is to provide a systematic course of action for protecting and preserving, and managing park resources. This course of action must conform to NPS Management Policies, legislative mandates, Executive Orders, zoning classifications and related planning documents.

The Resource Management Plan documents and evaluates existing management, monitoring, and research activities, identifies deficiencies in existing programs or knowledge, and addresses current or potential problems requiring resolution or mitigation. A four-year program for dealing with significant resources management problems is clearly defined in the plan, providing a basis for allocating funds and personnel. The Resource Management Plan is a documented commitment to deal with resource problems; it constitutes a yardstick with which actual accomplishments can be measured against stated objectives and needs.

The Resource Management Plan is also closely related to the park's Statement for Management, which provides a current summary of the state of the park, its significant resources, and influences on management. The Statement for Management is updated annually to reflect more timely and specific guidance than the format of the General Management Plan allows. Specific management objectives form the heart of the Statement for Management, establishing a framework for achieving the park's legislated purpose. The following management objectives have been approved for Guadalupe Mountains National Park, and will guide the development and implementation of the resource management program.

1. Acquire accurate and reliable information on which to base cultural and natural resource management decisions.

2. Maintain accurate field observations to assure that visitor use levels or practices do not impair park resources so that these resources are available for future generations.

3. Provide the information and guidance required to manage wilderness areas in accordance with the Wilderness Act of 1966.

4. Ensure the preservation and health of endangered species and park endemics.

Natural resources are constantly changing, both in response to natural forces and processes and directly, or indirectly in response to human activity. Cultural resources are more static, but they are subject to changes in human values and perception. Recognizing these facts, the Resources Management Plan must be dynamic, rather than static. As additional threats to park resources are identified, new technologies are developed, and management needs and priorities shift, the plan must be revised to reflect these changes. Only in being responsive to change, will the park's Resources Management Plan remain a continually valid and effective management tool.

In keeping with the NPS servicewide goals for natural park management, the park staff is attempting to increase its's emphasis on resource management as a basic function of park operations.

The current version of the Resource Management Plan further describes a series of project statements and funding requests, intended to support the resource management function in general. These projects include and are in support of legislation such as the Clean Air Act, Endangered Species Act, Wilderness Act, etc.; threatened and endangered species management, wildlife management, acid rain monitoring, air quality monitoring, aquatic management, resources monitoring, cave resource management, Integrated Pest Management, backcountry management, fire management, information gathering and retrieval, Geographic Information System (GIS) and support services needed to implement the above programs. Most of legislative mandated natural resource management projects are prioritized in the top 10 projects for the park.

In summary, no individual resource or resource type may be said to be more important than another. All resources, biotic and abiotic, of the land, water and air, with and affecting the park, are values for which the park has been designated and is legally responsible.

CULTURAL RESOURCES:

Extensive archeological investigations in the area that is now the park have taken place in two distinct phases: The 1930's and the period from the mid-1960's to 1980. An archeological inventory of the park, as required by Executive Order (E.O.) 11593, Section 110 of the National Historic Preservation Act of 1966 as amended, and the Archeological Resources Protection Act of 1979, was

conducted during a three-phase survey in 1970, 1973, and 1975. This survey meets E.O. 11593 requirements, however, it is estimated that 30-40 percent of the park has not been surveyed. There are 331 recorded sites in the park, including burned rock hearths, and scatters, midden rings and mounds, lithic and ceramic scatters, rock shelters, caves and pictographs. Twenty-seven of the recorded sites are considered eligible for listing in the National Register of Historic Places. The North McKittrick Canyon Complex was nominated to the National Register in 1990. Acceptance to the National Register is pending. The semiarid climate, the physical difficulty of gaining access to the park's high country, and the fact that the area was protected as private property until 1970, have probably contributed to a relatively high incidence of artifactual materials such as projectile points, stone tools, and pottery sherds being found in the park.

In compliance with Executive Order 11593, an inventory of the park's historic resources have also been completed. The history of the park areas is focused primarily on early settlement, ranching, mining, the Butterfield Stage Route, and military campaigns against the Mescalero Apaches. As a result of these activities, numerous structures remain in the park. The Pinery, an old stage route station along the Butterfield Overland Stage Route is included in the National Register of Historic Places. The Wallace Pratt residence (Ship-On-The Desert), Frijole Ranch, Pratt Cabin, and the Emigrant Trail to California/Butterfield Stage Route have been nominated to the National Register, but additional documentation is needed. All structures associated with the Pinery, Pratt Cabin, Ship-On-The Desert, Pine Springs Cafe Complex, and Frijole Ranch, as well as William Ranch House are included in the List of Classified Structures (LCS) for the park. The LCS for the park lists a total of 29 structures in the park. The remainder of the park's historic structures have been informally classified as "discovery sites" and are being allowed to molder away naturally.

The Administrative History of the Park, by Judy Fabry was completed and published by the Southwest Cultural Resources Center, as Professional Paper No. 19 in 1988. The history of the establishment of the park as well as major issues affecting park resources are included in the administrative history.

IV. Present Resource Status

Natural Resource Baseline Information:

NPS-75 (April, 1988) Standards and Guidelines for Inventorying and Monitoring, Chapters 4 and 5 of the draft guidelines were used to describe the inventorying and monitoring level at Guadalupe Mountains National Park. Some additional work remains to be done to meet all of the basic standards for Level I Inventory and Monitoring, as described in the NPS-75 (1988). Significant work remains to determine appropriate Level II and III monitoring needs and to meet these standards (See Project Statement N-0043, Inventory and Monitoring, for details).

I. Abiotic Inventory and Monitoring

A. Basic Inventorying for All Areas: (Does meet Level I criteria)

The park tracks unusual events through the standard 10-343 Incident Recording System. Fires have been recorded in a fire atlas for the park. The park collects fire weather data and using AFFIRMS, determines daily fire danger the year-around. Fire data has been collected in the park since 1977.

The park monitors acid rain and has participated in the National Atmospheric Deposition Program, (NADP) since 1984. A rain gauge records precipitation events.

Ozone monitoring instruments were installed at the park's air quality monitoring station in 1987. Other air quality monitoring instruments include a 35mm camera that measures visual contrast. A transimissometer was installed in 1987 to measure regional and local haze. An IMPROVED system to measure fine particulates such as sulfates, nitrates, fine dust, etc. was installed in 1987. Baseline data is being collected on ozone however, five years of data collection is not considered an adequate time period. Primary maps that show origins of pollutants have been developed by the Air Quality Division in Denver. No other event recorders are available.

USGS maps at the 1:24000 scale exist for the entire park, and are being used for all resource management projects in the park. 1933 maps by USGS on the scale of 1:62500 were used in the early years of the park for all projects. Data from these maps can be digitized and included into a GIS system, once a park GIS becomes operational.

The park has aerial photography, the most recent of which is true color, color infrared, and black and white at the 1:12000 and 1:24000 scale flown in October, 1990.

Since the park does not have an operational GIS, no satellite imagery is available in the park.

B. Geology: (Does not meet Level I criteria)

P.B King produced a geologic map in 1948 at the 1:48000 scale and was later published by the USGS. It is the only comprehensive geologic map of the park.

No special purpose maps showing geologic hazards such as floodplains exists in the park.

A soil map developed by the U.S. Soil Conservation Service in 1974 at the 1:1320 scale exists.

C. Hydrology: (Does not meet Level I criteria)

Dr. Ernest Fish, 1980, identified and mapped the park's watersheds. The USGS identified springs and the only perennial stream in the park in its 1973 map. (1:24000 scale) No other special purpose watershed maps exist.

The park established a water quality monitoring program in 1982. Temperature, pH, nitrates, sulfates, phosphates, calcium, hardness, parameter tests are conducted monthly from water samples collected in McKittrick Canyon.

D. Meteorology: (Does Meet Level I Criteria)

The park has an established weather station at Frijole (Pine Springs, Texas). Daily weather readings are taken. Data is published by the U.S Weather Service. A Remote Automated Weather Station (RAWS) is located in the high country.

E. Models: (Does Not Meet Level I Criteria)

No hydrologic or meteorologic models for the park exist.

II. Biological Inventorying and Monitoring

A. Historical Database (Does Meet Level I Criteria)

The park tracks unusual events through the standard 10-343 Incident Recording System. The park presently tracks unusual events such as a fire thru the standard fire reports. Other events such as drought are documented thru the weather reporting system. A system for recording of future events needs to be developed. A primary bibliography of all natural resource documents is available, but needs to be updated annually.

B. Maps of Biological Inventory (Does Meet Level I Criteria)

A land cover map developed by Barton Warnock in the mid-1970's. V. Davila developed a land cover vegetation map in 1986 using computer technology with 77% accuracy.

C. Species: (Does Meet Level I Criteria)

A status of rare, endangered and threatened plant species was conducted by Dr. Tony L. Burgess and Dr. David K. Northington in the mid-1970's. To date, over 900 plant species have been identified in the park since it was established in 1972. A list of threatened, endangered, endemic and non-native plants now exists, and requires periodic updating.

A compilation of various plant studies, vegetation maps, and plant lists (Dr. M. Powell, B. Warnock, B. Wauer) needs to be completed.

Checklists for mammals, birds, fish, amphibians, and reptiles have been developed for the park. There is a need to incorporate site locations for all wildlife into a dbase file.

The results of Tim Green's two-year study (1988-1990) on macro-invertebrates in McKittrick Canyon should be completed by January, 1992.

D. Populations and Population Dynamics: (Does Not Meet Level I Criteria)

The only extensive study of any wildlife has been the mountain lion study from 1983-1986. This study centered on the home ranges, dispersal, and population ecology of the mountain lion in the park. Earlier studies by J. Moody (1981) on elk centered on elk populations and movements. There have been various

population studies on other species of wildlife since the park was established. A compilation of all the data is needed (see GUMO-N-021).

E. Photography: (Does Meet Level I Criteria)

The park has black and white aerial photography at the 1:40000 scale flown in 1982. The most recent photography is 1990, true color, color infrared, and black and white, flown at the 1:12000 and 1:24000 scale for the entire park. Transects with photo points and markers have been developed for fuel loads, the 1972 Interagency Browse Survey, and fire transects after 1988.

F. Community Dynamics: (Does Meet Level I Criteria)

Species map of rare, threatened, endangered plants was developed by the Texas Natural Heritage Program in 1986. Maps showing populations and locations of McKittrick Pennyroyal (Hedoma apiculatum), a threatened species, were developed in 1988. Maps showing the location of peregrine falcons in the park are on file.

G. Models: (Does Not Meet Level I Criteria)

No modelling has ever been developed for any population species in the park.

Human Use (Activities) Inventory and Monitoring

A. Event Record: (Meets Level I Criteria)

Letters, memos and notes exist since the establishment of the park for such things as deer die-offs, the eradication of black-tailed prairie dogs prior to the establishment of the park in the 1960's, flooding in McKittrick Canyon, airplane crashes, droughts, etc.

B. Maps: (Meets Level I Criteria)

The park presently has maps showing all present use areas located on USGS 7.5 topographic maps. A total of 80 miles of hiking trails are shown on these maps.

Past use of these areas including, mining, ranching, farming, etc. All of these sites are located on a park base map.

C. Human Activities: (Meets Level I Criteria)

The park provides recreational activities such as birding, hiking, backcountry camping, horseback riding, tent camping, etc.

D. Ownership: (Meets Level I Criteria)

All park lands are owned by the U.S. Government. There is a special use permit for the Pine Springs Cafe that expires in 1992. There are several tracts of land near the park or adjacent to the park that the park administers including Section 18. (See Statement for Management)

E. Demography: (Does Not Meet Level I Criteria)

There are no studies that address all of the parameters outlined under this heading. A project statement has been included for such a study (See Project Statement I-004).

F. Domestic Animals: (Meets Level I Criteria)

Park owned horses include 8 horses and mules. House pets such as cats, dogs, canaries, etc., are allowed under the present park's Pet Policy. Pet owners are required to keep vaccination records. Their numbers fluctuate from year to year (12 park houses).

Horses are allowed in the park on a day-use basis only. No overnight use of horses is allowed in the park. Horse corrals for public use are separate from the park owned horse corrals.

G. Legal Matters: (Meets Level I Criteria)

Guadalupe Mountains National Park was authorized by Public Law 89-667, October 15, 1966.

NPS Management Policies (1988) are used to help guide the management of the park.

The Organic Act of 1916, the Wilderness Act, 1964, the Clean Air Act, 1977, and other related regulations and policies are used to manage the daily operations of the park. All pertinent acts, regulations, and policies are listed in the Statement for Management (1988).

H. Education Activities: (Does Not Meet Level I Criteria)

Guadalupe Mountains National Park is an isolated park with a limited staff. The staff is composed of 23 permanent and between 10-20 seasonal employees.

Research is limited, most research is funded by the Southwest Regional Office. The last major research funded project was a $28,000 elk research project in 1988-1990. Limited research funds are available from the park. A research center is operated by the park at Ship-On-The Desert and provides housing for park researchers.

I. Regional Land Use Planning: (Meets Level I Criteria)

The nearest hospital is 55 miles in Carlsbad, New Mexico. The next closest hospital is in El Paso, Texas, 110 miles west of the park.

Park housing is available to permanent employees with required occupancy as part of their position description to protect facilities and respond to emergencies. Electricity and propane is bought from a utility company and commercial propane outlets by the park employee. Telephone service is available to park housing residents.

J. Other Social Science Studies: (Does Not Meet Level I Criteria)

At the present time an Ethnographic Study is being proposed to research Mescalero Indian use of the area (See project statement I-004).

SUMMARY OF INVENTORY AND MONITORING NEEDS

Guadalupe Mountains National Park is a relative new park established in 1972. Prior to the establishment of the park, the area was managed as a large ranch-The Guadalupe Mountains Ranch. Geologic research of the area has occurred since the early 1930's. Limited biological studies were undertaken prior to the establishment of the park.

The Southwest Regional Office funded a large number of the earlier studies to collect baseline data. Most were contracted research projects as indicated in the bibliography in the appendix.

Copies of the results of these studies are located in the park library. The acquisition of a GIS would be beneficial for the park in order to track all the past studies and determine the needs and direction for future inventory and monitoring.

A review of the baseline inventory and monitoring sections identified several areas that need further study. The park does not meet Level I Criteria for the following categories; Geology, Hydrology, Hydrology Models, Populations and Population Dynamics, Population Models, Demography , Educational Activities, and Social Science Studies. References in individual project statements have been included in project statements under natural and interdisciplinary sections to meet Level I criteria. Future monitoring will be designed to meet Level II and III criteria.

Cultural Resource Baseline Information:

The Cultural Resource Documentation Checklist list 36 different planning documents, studies or plans. There are approximately 30 planning documents directly related to the management of cultural resources in the park. Only three planning documents current and approved. This three planning documents include; the Administrative History of the Park, Historical Base Map and the Exhibit Plan. A total of 15 documents need revision or updating. Eleven documents need to be developed for the park (see Attachment B-1 in appendix). These documents have been identified in project statements under cultural resources.

Cultural Resources:

ARCHEOLOGICAL SITES:

There are a total of 331 documented archeological sites in the park. Of these, 304 are considered to have state and regional significance. It is estimated that 30-40 percent of the park has not been surveyed (J. Bradford, 1991). The Texas Archeological Society conducted a survey in the park in 1970. The park was surveyed by Texas Tech University Field School in 1972, 1973 and 1974. Paul and Susan Katz conducted a partial survey of the high country in the park from 1973-1976. Numerous surveys have been conducted by archaeologists from the Southwest Regional Office since 1976. In 1990, 27 archeological sites in the North McKittrick Canyon Complex were nominated to the National Register of Historic Places by the State Historic Preservation Office (Texas). Their acceptance into the National Register is pending.

The condition of 304 of these sites is considered fair with 27 sites classified as good. There are 327 sites with low impacts associated with them, four with moderate impacts. Documentation on the 331 archeological sites is considered good.

A comprehensive archeological overview and assessment is needed for the whole park (see project statements C002, C003, C004, C015 and C029). The project statements listed above have identified different archeological aspects needing further investigations.

The new west side addition (10,209 acres) will require a comprehensive archeological survey in accordance with E.O. 11593 (see project statement C015). It is suspected that various archeological sites exist in this new addition.

STRUCTURES:

There are a total of 29 historic structures in the park. The Pinery, a structure built in 1858, as part of the Butterfield Overland Stage Route is located at Pine Springs. It is on the National Register of Historic Places (1979). It's condition is poor due to the age and condition of the rock material and mud mortar used in the construction. The ruin has low impacts

associated with it and documentation is fair.

A total of 25 structures have state or regional significant structures including the Pine Springs Cafe complex. Twenty-three of these buildings are in fair condition, two are in poor condition. Of these, 11 buildings have moderate impacts and 14 have low impacts. A total of eight structures have good documentation and 17 have fair documentation. Three of these structures are being evaluated for possible nomination to the National Register. These include the Frijole Ranch, Pratt Cabin, and Pratt's Residence (Ship-On-The Desert). All structures were included into the park's Maintenance Management System (MMS) in 1988 and documentation of any type of maintenance work is entered into that particular structure file.

OBJECTS:

There are a total of 47,590 museum items listed for Guadalupe Mountains National Park under Attachment E-3, Summary Chart for Objects.

Of these, 1,143 items have been catalogued and have the park's museum catalog number. There are 6,277 catalogued items at various other institutions and universities throughout the United States. A total of 41,313 items need to be catalogued including items in the park and at other repositories. Total collection for all objects in and out of the park is 47,590 items. In the past three years the rate of acquisition has been less than in the previous three years. This is probably true due to the limited space available before the new visitor center was built.

The condition of 31,060 archeological artifacts is unknown along with 355 historic artifacts, 14,159 items listed under archives, 1,712 biological specimens and 36 paleontological objects.

Museum work is being conducted to meet all NPS Museum Guidelines and a project statement (I-002) addresses the museum collection needs. A museum collection plan needs to be developed and a comprehensive inventory of all museum items and their locations need to be conducted.

CULTURAL LANDSCAPES:

A total of four cultural landscape plans need to be developed for the park. Landscape plans for the Pinery, Frijole Ranch, Pratt Cabin, and Ship-On-The-Desert.

The main purpose of the cultural landscape plan is to identify, the activities that took place at these sites and the perimeters around these structures that need to be protected and managed. The condition for these four sites that need to be evaluated as cultural landscapes are as follows. The four sites are in fair condition, have low impacts and all have air documentation.

ETHNOGRAPHIC RESOURCES:

A project statement entitled, "Ethnohistory of the Mescalero Apaches" is included in this plan (see Project Statement C-010). It is listed as # 10 priority in the cultural resource section. The main focus is to determine the extent and nature of the Mescalero Apaches's use of the Guadalupe Mountains for economic, religious, and military purpose during historic times.

An Ethnographic Overview and Assessment is needed for the park. A project statement is included in this plan to help meet this need.

At the present time, Mescalero Apaches do come to the Guadalupe Mountains to collect various plants, but no request have been made to the park.

CULTURAL CONTEXT/TEXT:

The cultural context/theme in accordance with the History and Prehistory in the National Park System and the National Historic Landmarks Program (1987) Guidelines for the park is multi-themed. It includes I. Cultural Developments: Indigenous American Populations, A. The Earliest Inhabitants, # 10. Archaic Adaptations of the Southwest, to include the earliest inhabitants to this area. It includes II. European Colonial Exploration and Settlement A. Spanish Exploration and Settlement. # 2. Southwest. It also includes; X. Westward Expansion of the British Colonies and the United States, 1763-1898 and XIV Transportation under subtopic D, Overland Travel West of the Mississippi after 1840.

Several subtopics are included in the park's theme including; the Archaic Settlement, the Spanish Exploration, Western Trails and Travelers, the Mining Frontier, The Farmer's Frontier, the Cattlemen's Empire.

Prehistoric man left behind pictographs in rock shelters, burned rock middens and large mescal pits as evidence of their existence in this area. Fire hearths are found in the west side of the park, where fires were built during their nomadic travels. One site just outside the park boundary has petroglyphs.

The earliest exploration to this area was during the 1840' with the U.S. Army establishing military posts in the area and conducting reconnaissance and skirmishes with the Native-Americans in the area most notable the Mescalero Apaches. The

Emigrant Trail to California started with the Gold Rush to California in 1849 and transversed the park. Butterfield Overland Stage Route was established in Pine Springs in 1858, and was operational for 18 months. It followed portions of the Emigrant Trail. Portions of this trail are still visible in the park, and the Southwest Regional Office is nominating sections of this trail to the National Register.

By 1900's large and small ranches dotted the countryside of the Trans-Pecos area of Texas. J.C. Hunter started buying land in the 1930's and created, The Guadalupe Mountains Ranch. This ranch was operational until the park bought the land from Mr. Hunter in the late 1960's.

Mining of ores also took place after 1900. There are approximately 10 copper mines in Dog Canyon. Mining activities started at the turn of the century and continued until the 1940's. The Texas Calumet Mining Company involved in these mining operations in what is now Dog Canyon.

Oil and gas exploration took place in the late 1950's thru the 1960's. Several oil wells were drilled right before the area became a national park in hopes of discovery oil and keeping mining claims. A oil well was drilled at the mouth of McKittrick Canyon and one a Pine Springs. The one at McKittrick Canyon was a dry hole, the one at Pine Springs produced low quality natural gas. Pure Well on the west side started as a oil well exploration hole. It hit water instead and became a water source for the west side ranching operations in the 1940's.

The park's major interpretive center at Frijole Ranch House slated for opening in FY 92 will have a multi-cultural theme exhibits. It will incorporate all of the above themes into the exhibits including the Prehistoric, Historic and Modern Man bringing together all the themes that have been a part of the park.

V. RESOURCES MANAGEMENT PROGRAMS

Overview of Current Program and Needs

Fencing is the park's number one resource management priority. During the past three years, the park has received Natural Resource Preservation Protection (NRPP) funding for this project. The park has fenced a total of 15 miles of boundary over very rugged mountainous terrain. In FY 91, $250,000 is allocated to the park to complete fencing the entire boundary of the park.

Fire Management is the park's number two resource management priority. Suppression of fires in the Guadalupe Mountains over the last 100 years have contributed to heavy fuels buildup and an unnatural fire cycle. Lightning fires are a major cause of ignition in the Guadalupe Mountains. Over the last three years, 16 lightning caused fires have been reported in the park. The park received $40,000 for firepro activities in FY 91.

Visitor impacts on riparian communities in McKittrick Canyon is a concern to park management. The canyon is the most visited area, year-round (192,890 visitors to the park in 1990). The park service is committed to protecting this fragile biological area. Careful monitoring and research is needed to assure that visitors do not impact this unique, fragile, riparian community. Protection is carried out by conducting backcountry patrols, sampling water quality, and intensity patrols during the fall color season.

Other major issues of concern include; 1) Peregrine Falcon monitoring, 2) threatened and endangered species management, 3) monitoring of visibility resources, including air quality and acid rain, 4) west side vegetation study, 5) backcountry use, 6) and the development of a Geographic Information System (GIS).

The main emphasis of the first three project statements is to follow present laws, regulations, management policies and executive orders for the protection of natural resources. Continued monitoring for endangered species within the park is required. Air quality monitoring is performed by maintaining the air quality station weekly, where baseline data is being collected. The park receives $8,000 annually for air quality monitoring purposes. The park provides habitat for one endangered animal (Peregrine falcon) and two endangered plants (Lloyd's Hedgehog Cactus and Sneeds' Pincushion Cactus). The addition of the west side (10,209 acres) will require a comprehensive vegetation inventory.

The area is known to have one Category 2 Plant (Gypsum Scalebroom-Lepidiospartum burgesii). Backcountry use is rising and the need to protect these valuable natural resources is important. Park management uses park base funding to hire seasonal backcountry rangers to conduct patrols in the high country.

The acquisition of a Geographic Information System (GIS) is important for storing and manipulating data from past and present research. Information generated from this data will give park management a basis for making decisions affect natural resources.

A total of 42 natural resource management project statements are included in this plan. The existing resource management plan approved in 1987 had 25 project statements. The addition of 17 new project statements is to continue to have a comprehensive park-wide resource management program that is dynamic. Some of the 18 new project statements include the reintroduction of black-tailed prairie dogs, bighorn sheep and pronghorn antelope designed to increase biodiversity of the park's ecosystem. It also includes the removal of exotic species such as rainbow trout in McKittrick Canyon, mouflon and barbary sheep, and plants such as tamarisk (salt cedar-Tamarix sp.).

ROUTINE NATURAL RESOURCE MANAGEMENT PROJECTS AND PROGRAMS include; 1) routine maintenance affecting natural resources (trail and road maintenance work), 2) Integrated Pest Management, 3) backcountry restoration, 4) scientific collecting management, 5) collection of meteorological data (daily, weekly and monthly), 6) cave protection. These projects are all funded under the park's base budget and are needed and conducted for visitor safety and the protection of natural resources.

ONGOING NATURAL RESOURCE MANAGEMENT ACTIVITIES include; 1) monitoring of acid rain and air quality, 2) monitoring of visitor impacts in McKittrick Canyon, 3) insect and disease monitoring including plague and rabies surveillance work, 4) water quality monitoring, 5) monitoring predator populations, and 6) fire management. Some of these projects are funded out of WASO, including air quality monitoring and fire management. The others projects and programs are needed to obtain baseline data and are funded out of the park's budget.

New resource management projects included in this plan by priority include the following:

	Title	Priority
1.	GIS Acquisition	7
2.	West Side Veg. Study	8
3.	Ranching Effects on vegetation	12
4.	Mexican Spotted Owl Survey	13
5.	Adjacent Land Use	16
6.	Dune Geology	17
7.	West Side Mammal Survey	18
8.	Geologic Resources	20
9.	Reintroduction of Prairie Dogs	24
10.	Water Quantity	27
11.	Insect Study	31
12.	Bird Survey	32
13.	Reintroduction of Pronghorn Antelope	34
14.	Meteorological Data Collection	36
15.	Paleontologic Resources	37
16.	Removal of Exotic Fish	38
17.	Inventory and Monitoring	40

The most critical issues of this new list include the acquisition of a GIS, the west side vegetation study, ranching effects on the vegetation, and the Mexican Spotted Owl survey. Their priority numbers are #7, 8, 9, and 12 on the list.

Current Natural Resource Management Activities:

At the present time, the park is conducting several on-going resource management projects under Servicewide Code (SWC) N01. They include the monitoring of the ungulate herd (N07), predator populations (N08), vegetation utilization by ungulates (N09) and insect and disease control (N16). These projects are on-going at this time. The monitoring of the ungulate herd takes place by writing observation cards on USDI Form 10-257, Natural Field Observation Cards on deer and elk, documenting the births, deaths, etc., and keeping these observation cards on file. Predator populations are monitored in the same manner as above with one addition. The biannual reading of mountain lion transects developed by Tom Smith, mountain lion researcher, and established by park personnel in 1987. Vegetation transects are being read by park staff as part of an ongoing vegetation monitoring program. Fire transects established during the last three years will give us information on this subject. Insect and disease control efforts include the monitoring of dwarf mistletoe on ponderosa pine in the high country and red rust on juniper trees. Plague and rabies are also being monitored in the park.

The park is continuing to monitor the peregrine falcon an endangered species SWC-N02, aerie site in McKittrick Canyon every year. Compilation of this data is written into an annual monitoring report. Project statement GUMO-N-011 supports this information.

There are three threatened or endangered plant species SWC-N03, in the park. The park has one threatened species, McKittrick Pennyroyal, Hedoma apiculatum that it monitors and investigates other areas in the park for possible new locations. Two endangered cactus are found in the park. They include; 1) Sneed's Pincushion Cactus, Coryphantha sneedi var. sneedi and 2) Lloyd's Hedgehog Cactus, Echinocerus lloydii. Park personnel continue to look at different locations in their habitat and document new plant locations.

Park staff continue to monitor the park's backcountry for the existence of non-native animals SWC-N04, that include barbary sheep and mouflon (See project statement GUMO-N-014). Due to the extremely rugged mountainous terrain, only one mouflon sheep has been killed in the last three years.

During 1987 and 1988, the park had an active cutting and treatment program for tamarisk (Tamarix sp.), an exotic plant species, SWC-N05. The park continues to monitor the areas that were cut and treated, by monthly visits to the area and photographing them using established photopoints. Kill rate was 95 percent. One small area of trees just outside the park boundary remains.

Due to man's suppression of fire in the Guadalupe Mountains over the last 100 years, heavy fuels buildup has created an explosive and hazardous condition in the high country, (SWC-N07). The park's Fire Management Plan is being revised to include all the new guidelines, restrictions, and key words, since the 1988 fire season.

The park is conducting monthly water quality sampling in McKittrick Canyon, SWC-N11. Although major threats are not present, the water source is outside the park boundary on U.S. Forest Service land. Baseline data is being collected.

The park is a Class I airshed, (SWC-N14). Monitoring of the park's precipitation (NADP) and air quality began in 1984 and continues to the present time. The park is collecting baseline information. The park receives $8,000 for air quality monitoring each year.

In the past, oil and gas development has been a threat near the park, but due to the drop in oil prices, it has subsided, (SWC-N16). Visual impacts of near-park development on park esthetics qualities and the reactions of visitors to these changes may occur (See GUMO-N-N19) if oil and gas drilling occurs on adjacent lands.

The park's biodiversity is important in maintaining a healthy ecosystem (SWC-N17). There is an general consensus that the park's elk herd has interbreed for many years and that the herd will eventually perish. Another species that recently was reintroduced into the park's ecosystem to increase the biodiversity is the Montezuma quail. They are still being seen in the area, but the overall success of the reintroduction is still not complete. Other reintroduction projects planned for the future are included in the future needs sections.

A park wide program of eliminating illegal fire rings, social trails, backcountry sites denuded of vegetation has been an on-going program (SWC-N18).

The collection of baseline data includes the issuance of collecting permits, the acquisition of research results, the compilation of natural resource data into a workable database, the collection of water quality samples, the collection of weekly air quality and weather data (SWC-N20). The gathering of data into a workable and manageable database assures management will have reliable scientific data available from which to make management decisions.

There are approximately 26 caves in the park (SWC-N21). An approved cave management plan (1991) is in effect to protect and manage cave resources.

Backcountry use is a primary concern for park management with an increase in recent visitation to the park (192,890 visitors in 1990). Backcountry patrols are need to assured adequate protection of the park resources is taking place (SWC-N22). Backcountry campsites need to be adequately delineated and ranger presence is needed to stop illegal campfires and camping outside delineated campsites.

The routine maintenance affecting natural resources includes such things as road and trail maintenance, trimming of vegetation along the roadside and trail to assure visitor safety (SWC-N24).

The following table summarizes the current activities and future needs:

CURRENT ACTIVITIES Servicewide Code/ Project Statement		FUTURE NEEDS Servicewide Code/ Project Statements
1. N01:	N07,N08,N09,N16	1. N01:
2. NO2:	N10, N11	2. NO2: N26
3. N03:	N10	3. NO3:
4. NO4:	N14	4. N04:
5. NO5:	N22	5. N05:
6. N06:		6. NO6: N27, N30, N41
7. N07:	N01	7. N07:
8. N08:		8. N08: N30
9. N09:		9. N09:
10. N10:		10. N34:
11. N11:	N06	11. N11:
12. N12:	N06	12. N12:
13. N13:		13. N13:
14. N14:	N18	14. N14:
15. N15:		15. N15:
16. N16:	N19	16. N16: N41
17. N17:	N07, N13	17. N17: N12, N27, N32
18. N18:	N03	18. N18:
19. N19:		19. N19:
20. N20:	N20, N21, N24, N29, N31	20. N20: N26, N33, N34, N35, N36, N37, N38, N42
21. N21:	N04	21. N21:
22. N22:	N02, N05, N17	22. N22:
23. N23:		23. N23: N40
24. N24:	N25	24. N24:

Future resource management projecs and programs are based on the needs of the park, especially with the acquisition of the west side addition (10, 290 acres). There is a need to collect baseline data before any type of management plan or decision is made on any developments. As you can see from the table above, the major emphasis is on collecting baseline data as noted under

Servicewide Code #20,- Baseline monitoring N20. The second category with the most project statements is N17, the reintroduction of several species of wildlife including black-tailed prairie dogs, pronghorn antelope and desert bighorn to increase the biodiversity of the park.

Other issues to consider are the impacts of outside developments such as on the southside of the park that are taking place at this time (N06).

List of Project Statements by Park Priority

Natural Resource Management Program

Priority Number	Project Statement Title
1.	N15-Boundary Fencing
2.	N01-Fire Management
3.	N05-Visitor Impacts on Riparian Communities in McKittrick Canyon
4.	N11-Peregrine Falcon Management
5.	N10-Threatened and Endangered Species Management
6.	N18-Visibility Resources
7.	N33-Develop A Geographic Information System
8.	N37-West Side-Vegetation Study
9.	N02-Backcountry Use
10.	N24-Black Bear Survey
11.	N08-Predator Populations
12.	N30-Ranching Activities Effects on Vegetation
13.	N26-Mexican Spotted Owl Survey
14.	N21-Natural Resources Information Base
15.	N06-Surface Water Resources
16.	N41-Adjacent Land Uses
17.	N34-Dune Geology
18.	N39-West Side-Mammal Survey
19.	N07-Monitor Ungulate Herds
20.	N38-Geologic Resources
21.	N03-Backcountry Restoration

22. N13-Reintroduction of Montezuma Quail

23. N23-Resources Management Support Services

24. N27-Reintroduction of Black-Tailed Prairie Dog

25. N42-Inventory and Monitoring

26. N17-Integrated Pest Management

27. N29-Water Quantity

28. N14-Barbary Sheep Management

29. N09-Vegetation Utilization by Ungulates

30. N16-Insect and Disease Control

31. N35-Insect Studies

32. N36-Bird Survey

33. N04-Cave Protection and Use

34. N32-Reintroduction of Pronghorn Antelope

35. N20-Scientific Collecting

36. N31-Meteorological Data Collection

37. N40-Paleontologic Resources

38. N28-Removal of Exotic Fish in McKittrick Canyon

39. N25-Routine Maintenance Projects Affecting Natural Resources

40. N12-Reintroduction of Desert Bighorn Sheep

41. N19-Oil and Gas Development

42. N22 Exotic Plants Management

Current Cultural Resource Management Projects:

There are a number of ongoing cultural resources management projects and programs in the park and include the following project statements. 1) Protection of Archeological Sites (C003), 2) Historic Structural Guides, Routine Maintenance of Historic Structures (C008), and Ethnohistory of the Mescalero Apaches (C010). Four project statements are included under the Interdisciplinary section that blend natural and cultural resources in this discipline. The most important of these is the museum collection. The other three project statement have been identified as future needs in cultural resource management.

Protection of archeological sites has been a park wide project in which all documents relating to specific site locations are kept in the resource management office locked in a cabinet and out of the park's library. This is to discourage anyone from obtaining specific information on an archeological site and damaging the site. Rangers perform backcountry and frontcountry patrols into known archeological sites to discourage damage to the site by visitors. Park interpreters protect archeological sites by giving educational materials and information to the visiting public on the need to protect our cultural resources. Thru education, they point out the valuable resources can be damaged thru carelessness and ignorance of laws. Signing throughout the park help to reinforce the need to protect both prehistoric and historic sites.

At the start of the fencing project (N015) that started in 1989, the park contracted a New Mexico firm to conduct an archeological survey of the proposed fencing route. Sites discovered during this survey are protected and working crews are told not to disturbed any archeological site in the field. During the summer of 1991, the park will complete the third year of this fencing project. Contract crews and their crew leaders will be informed of the need to protect these archeological sites and the laws that protect these sites.

Routine maintenance is conducted on historic buildings in the park throughout the year. In 1989, a total of four XXX forms were approved by the regional office for work on historic buildings including; Pratt Cabin, the Servant's Quarters at Ship-On-The Desert, the Pinery, and Hunter Cabin. In 1990, a total of three XXX forms were approved in the regional office for work on the following; the pruning of trees around the Frijole Ranch House, relocation of horse corrals and the Bowl Tank Evaluation. In 1991, the park has already completed and has received approved for one XXX form for exterior repairs to the Frijole Ranch House. The park has an active historic structures monitoring program as seen from past work on these structures.

Dr. James Goss, Texas Tech University, Lubbock, Texas has been conducting limited research into the life of the Mescalero Apache in the Guadalupe Mountains (C-010) for the past three years. A final report is forthcoming in FY 91.

Cultural resource information (C-014) is being collected annually in the form of reports from research, such as the Administrative History of the Park completed in 1989, nomination forms to the National Register, such as the State of Texas nomination of 27 archeological sites to the National Register in 1990. Maps, photographs, and various other types of documentation are being obtained by the park. This information will be incorporated into a GIS for easy access and manipulation.

The museum collection has had limited management in the past, due to the lack of trained personnel and limited storage space. The opening of a new visitor center, created adequate museum collection space. The hiring of a new employee in October, 1990, that will devote 50 percent of their time to managing the collection will help with the backlog of unaccessioned objects and with the care of the collection.

FUTURE NEEDS IN CULTURAL RESOURCES:

The addition of 16 new project statements in the cultural resource management plan and the addition of four others in the Interdisciplinary section reflects the present management concerns for the protection and careful management of cultural resources in the park.

The most important project statements with servicewide codes (SWC) in cultural resource management that need addressing are as follows: As previous mentioned under the heading Cultural Resource Baseline Information, of the total 36 different planning documents listed in the Cultural Resource Documentation Checklist, a total of 15 documents need revision or updating to meet Servicewide goals (SWC-C01). The need to update or revise these documents have been identified in cultural resource project statements.

The park need a comprehensive and park wide archeological overview and assessment (SWC-C02). The park needs information on what archeological work has been completed in the past and where future work should be directed. The need to complete this overview and assessment is identified under project statement C-029. The west side addition needs a complete archeological survey before any developments occur.

There is also a need for an Ethnographic Overview and Assessment for the park (SWC-C04). This need has been identified in project statement I-004. Future studies should be conducted to meet this need.

New project statements for each structure are included in project statements C-016 to C-027. The park has identified the need to write or update a Historic Structure Report, and assess the condition of these structures (SWC-C07).

Other project statements have been included to meet Servicewide Cultural Resource Management issues and include; 1) A need to for a Historic Resource Study (SWC-C08), 2) Need for collection management plan, collection storage plan and collection storage survey (SWC-C09), 3) Need for several specialized studies on the Mescalero Apache, historic road and encampments, history of mining, Butterfield Overland Stage route, and effects of fire on archeological sites (SWC-C10), 4) Project statements for the development of four cultural landscape plans are included in project statements (SWC-C11), 5) Routine cyclic maintenance has already been identified and is list above as current, but is still listed here as an important component in the management of historic structures (SWC-C12), 6) Inadequate staffing to provide better protection of archeological and historic structures is listed as a future need (SWC-C18), 7) the need to increase the cultural resource management staffing is the last item listed (SWC-24).

These future cultural resource needs are critical for the management of all cultural resources in the next five years.

STATUS OF CURRENT RESOURCE MANAGEMENT CAPABILITIES:

The park has a full time Resource Management Specialist that devotes 70 percent of his time to natural resources and 30 percent to cultural resources. Funding for the current year does not support any additional new staffing out of the park base budget. There is a need for a full time geologist to work with geologists and collecting permits. There is also a need for a full time employee once a GIS becomes operational. These positions are explained in greater detail and FTE's are included in their respective project statements (see N038 and N033).

At the present time, the Resource Management Specialist (RMS) works directly in a staff position for the Chief Ranger with RMS providing direction, expertise and supervision of the all resource management projects. A great deal of monitoring and daily resource management activities are carried out by the District Ranger and his permanent and seasonal staff. The District Ranger supervises three permanent employees that provide law enforcement protection to both natural and cultural resources in the park. Maintenance provides most of the cultural resource management expertise and work on historic structures. The interpretive staff composed of the Chief, Division of Interpretation and Visitor Services and three permanent staff

employees with one permanent staff member assigned to curatorial duties 50 percent of their time. Seasonal staffing varies from year to year in each division. See Table 1 for current FY 91 personnel and funding for current year.

List of Project Statements by Park Priority

Cultural Resources Management Program

Park Priority	Project Statement Title
1.	C16-Frijole Ranch House
2.	C25-Pine Springs Cafe
3.	C18-Frijole Cultural Landscape Report
4.	C17-Frijole Outbuildings
5.	C24-The Pinery
6.	C26-Butterfield Overland Stage Route
7.	C29-Archeological Overview and Assessment
8.	C20-Pratt Cabin Landscape and Outbuildings
9.	C19-Pratt Cabin
10.	C10-Ethnohistory of Mescalero Indians
11.	C22-Ship-On-The Desert
12.	C27-William Ranch House
13.	C04-Effect of Fire on Archeological Sites
14.	C32-General Park History
15.	C31-Cultural Site Inventory
16.	C11-Survey of Historic Roads and Encampments
17.	C08-Historical Structure and Routine Maintenance
18.	C29-Archeological Survey of the West Side
19.	C21-Hunter Line Cabin
20.	C09-Historic Resource Study

21. C06-Rock Art Study

22. C03-Protection of Archeological Sites

23. C02-Archeological Surveys of High Impact Areas

24. C13-History of Mining

25. C12-History of Ranching

26. C23-Ship-On-The Desert Cultural Landscape Report

27. C14-Cultural Resources Database

28. C05-Prehistoric Use of Area

29. C07-Historical Structures (LCS)

30. C28-Cultural Resource Management Support

31. C01-Museum Collection-Moved to I02

List of Project Statements by Park Priority

Interdisciplinary Management Program

1. I01-Impacts of Previous Land Use

2. I02-Museum Collection (formerly C-01)

3. I04-Social/Ethnographic Overview and Assessment

4. I03-Well and Mining Site Restoration

Programming Sheets

06/25/92
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TABLE 1
NPS RESOURCE PERSONNEL
(current year only)

FY: 92
PARK: GUMO
REGION: SWR

TYPE OF NPS EMPLOYEE	FTEs OF RESOURCES WORK		
	Natural	Cultural	Total
Research Scientists	0.0	0.0	0.0
Resources Specialists	0.7	0.3	1.0
025 Park Rangers Res Mgmt	3.1	0.7	3.8
025 Park Rangers Res Prot	1.7	0.3	2.0
025 Park Rangers Res Interp	1.4	0.5	1.9
Maintenance Personnel	3.8	1.9	5.7
Total of RES Personnel	10.7	3.7	14.4
TOTAL PARK FTE: 38.0 PERCENT	28.2%	9.7%	37.9%

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

Page: 001
FY: 92
PARK: GUMO
REGION:

FUNDING SOURCE	TOTAL	RES	MIT	MON	PRO	INT	ADM
PCR1	147.0	0.0	94.0	8.0	8.0	0.0	37.0
RVIP	3.0	0.0	1.0	0.0	0.0	0.0	2.0
RCCM	75.0	0.0	75.0	0.0	0.0	0.0	0.0
POF1	190.0	0.0	130.0	0.0	0.0	60.0	0.0
NDON	18.0	0.0	18.0	0.0	0.0	0.0	0.0
SFIR	28.0	0.0	1.3	0.0	26.7	0.0	0.0
PNR1	228.6	0.0	21.0	42.0	89.6	0.0	76.0
TOTAL	689.6	0.0	340.3	50.0	124.3	60.0	115.0

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

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR 1992 $$	CURRENT YEAR 1992 FTE	OUTYEAR 1 1993 $$	OUTYEAR 1 1993 FTE	OUTYEAR 2 1994 $$	OUTYEAR 2 1994 FTE	OUTYEAR 3 1995 $$	OUTYEAR 3 1995 FTE	TOTAL $$	TOTAL FTE
001.000	FIRE MANAGEMENT	185		N07	FIRE	PRO	26.7	1.0	26.7	1.0	26.7	1.0	26.7	1.0	106.8	4.0
					PARK-NR	ADM	4.0	0.1	4.0	0.1	4.0	0.1	4.0	0.1	16.0	0.4
					FIRE	MIT	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0
					PARK-NR	MIT	3.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.1
					Subtotal		35.0	1.2	30.7	1.1	30.7	1.1	30.7	1.1	127.1	4.5
002.000	BACKCOUNTRY USE	192		N22	PARK-NR	PRO	36.6	2.0	36.6	2.0	36.6	2.0	36.6	2.0	146.4	8.0
003.000	BACKCOUNTRY RESTORATION	77		N18	PARK-NR	MIT	15.0	0.2	15.0	0.2	15.0	0.2	15.0	0.2	60.0	0.8
004.000	CAVE PROTECTION AND USE			N21	PARK-NR	PRO	3.0	0.1	3.0	0.1	3.0	0.1	3.0	0.1	12.0	0.4
005.000	VISITOR IMPACTS ON RIPAR. COMM. IN MCKITTRICK CYN.			N22 N18	PARK-NR	PRO	50.0	1.5	50.0	1.5	50.0	1.5	50.0	1.5	200.0	6.0
006.000	SURFACE WATER RESOURCE	187		N11 N12	PARK-NR	MON	5.0	0.1	5.0	0.1	5.0	0.1	5.0	0.1	20.0	0.4
007.000	MONITOR UNGULATE HERD	171		N01 N17	No data											
008.000	PREDATOR POPULATIONS	166		N01	PARK-NR	MON	5.0	0.2	5.0	0.2	5.0	0.2	5.0	0.2	20.0	0.8
009.000	VEGETATION UTILIZATION BY UNGULATES			N01 N04	PARK-NR	MON	2.0	0.1	2.0	0.1	2.0	0.1	2.0	0.1	8.0	0.4
010.000	THREATENED & ENDANDERED SPECIES MANAGEMENT	188		N02 N03	PARK-NR	MON	1.0	0.1	1.0	0.1	1.0	0.1	1.0	0.1	4.0	0.4
011.000	PEREGRINE FALCON MGMT.	163		N02	PARK-NR	MON	1.0	0.1	1.0	0.1	1.0	0.1	1.0	0.1	4.0	0.4
012.000	REINTRODUCTION OF BIGHORN SHEEP	185		N17	No data											
013.000	REINTRODUCTION OF MONTEZUMA QUAIL			N17	PARK-NR	MON	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	4.0	0.0

continued...

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR 1992 $$	CURRENT YEAR 1992 FTE	OUTYEAR 1 1993 $$	OUTYEAR 1 1993 FTE	OUTYEAR 2 1994 $$	OUTYEAR 2 1994 FTE	OUTYEAR 3 1995 $$	OUTYEAR 3 1995 FTE	TOTAL $$	TOTAL FTE
014.000	EXOTIC SHEEP ENCROACHMENT	164		N04	PARK-NR	MIT	1.0	0.1	1.0	0.1	1.0	0.1	1.0	0.1	4.0	0.4
015.000	BOUNDARY FENCING	160		N24	PKBASE-OT	MIT	10.0	0.3	10.0	0.3	10.0	0.3	10.0	0.3	40.0	1.2
016.000	INSECT AND DISEASE CONTROL	191		N01	PARK-NR	MON	0.5	0.1	0.5	0.1	0.5	0.1	0.5	0.1	2.0	0.4
017.000	INTEGRATED PEST MGMT.	191		N22	PARK-NR	ADM	2.0	0.1	2.0	0.1	2.0	0.1	2.0	0.1	8.0	0.4
					PARK-NR	MON	2.0	0.1	2.0	0.1	2.0	0.1	2.0	0.1	8.0	0.4
					Subtotal		4.0	0.2	4.0	0.2	4.0	0.2	4.0	0.2	16.0	0.8
018.000	VISIBILITY RESOURCES	200		N14	PARK-NR	MON	2.0	0.1	2.0	0.1	2.0	0.1	2.0	0.1	8.0	0.4
019.000	OIL AND GAS DEVELOPMENT	165		N16 N06	No data											
020.000	SCIENTIFIC COLLECTING			N20	PARK-NR	MON	5.0	0.1	5.0	0.1	5.0	0.1	5.0	0.1	20.0	0.4
021.000	NATURAL RESOURCE INFORM. DATABASE			N20	PARK-NR	ADM	2.0	0.1	3.0	0.2	3.0	0.2	3.0	0.2	11.0	0.7
022.000	EXOTIC PLANT MANAGEMENT	191		N05	PARK-NR	MIT	2.0	0.1	2.0	0.1	2.0	0.1	2.0	0.1	8.0	0.4
023.000	NATURAL RESOURCE MGMT. SUPPORT SERVICES			N24	PARK-NR	ADM	66.0	1.2	66.0	1.2	66.0	1.2	66.0	1.2	264.0	4.8
					PKBASE-OT	INT	45.0	1.4	45.0	1.4	45.0	1.4	45.0	1.4	180.0	5.6
					Subtotal		111.0	2.6	111.0	2.6	111.0	2.6	111.0	2.6	444.0	10.4
024.000	BLACK BEAR SURVEY	197		N20	PARK-NR	MON	0.5	0.0	0.5	0.0	0.5	0.0	0.5	0.0	2.0	0.0
025.000	ROUTINE MAINTENANCE AFFECTING NAT. RESOURCES	83		N24	PKBASE-OT	MIT	95.0	2.5	95.0	2.5	95.0	2.5	95.0	2.5	380.0	10.0
026.000	MEXICAN SPOTTED OWL SURVEY	238		N20 N02	No data											
027.000	REINTRODUCTION OF BLACKTAILED PRAIRIE DOG			N17 N06	No data											

continued...

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

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR 1992 $$	CURRENT YEAR 1992 FTE	OUTYEAR 1 1993 $$	OUTYEAR 1 1993 FTE	OUTYEAR 2 1994 $$	OUTYEAR 2 1994 FTE	OUTYEAR 3 1995 $$	OUTYEAR 3 1995 FTE	TOTAL $$	TOTAL FTE
028.000	REMOVE EXOTIC FISH IN MCKITTRICK CANYON			N04	No data											
029.000	WATER QUANTITY			N20 N12	No data											
030.000	RANCHING ACTIVITIES EFFECTS ON VEGETATION			N06 N08	No data											
031.000	METEOROLOGICAL DATA COLLECTION			N20	PARK-NR	MON	5.0	0.1	5.0	0.1	5.0	0.1	5.0	0.1	20.0	0.4
032.000	REINTRODUCTION OF PRONGHORN ANTELOPE			N17	No data											
033.000	DEVELOP A GEOGRAPHIC INFORMATION SYSTEM			N20	PARK-NR	ADM	2.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.1
034.000	DUNE GEOLOGY			N10 N20	No data											
035.000	INSECT STUDIES			N20	VOL-IN-PK	MON	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
036.000	BIRD SURVEY			N20	PARK-NR	MON	2.0	0.1	2.0	0.1	2.0	0.1	2.0	0.1	8.0	0.4
037.000	WEST SIDE-VEGETATION STUDY			N20	No data											
038.000	GEOLOGIC RESOURCES			N20	No data											
039.000	WEST SIDE MAMMAL SURVEY			N20	No data											
040.000	PALEONTOLOGIC RESOURCES			N23	No data											
041.000	ADJACENT LAND USES			N06 N16	No data											

continued...

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

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR 1992 $$	CURRENT YEAR 1992 FTE	OUTYEAR 1 1993 $$	OUTYEAR 1 1993 FTE	OUTYEAR 2 1994 $$	OUTYEAR 2 1994 FTE	OUTYEAR 3 1995 $$	OUTYEAR 3 1995 FTE	TOTAL $$	TOTAL FTE
042.000	INVENTORYING AND MONITORING			N20	PARK-NR	MON	10.0	0.2	10.0	0.2	10.0	0.2	10.0	0.2	40.0	0.8
42 projects printed					Grand Total		406.6	12.5	401.3	12.2	401.3	12.2	401.3	12.2	1610.5	49.1

PROGRAMMING SHEET 2
NATURAL
UNFUNDED ACTIVITIES
($ in thousands)

PK PRI	PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR $$	CURRENT YEAR FTE	OUTYEAR 1 $$	OUTYEAR 1 FTE	OUTYEAR 2 $$	OUTYEAR 2 FTE	OUTYEAR 3 $$	OUTYEAR 3 FTE	TOTAL $$	TOTAL FTE
0	015.000	BOUNDARY FENCING	160		N24	RG-NR-OTH	MIT	0.0	0.0	50.0	1.5	0.0	0.0	0.0	0.0	50.0	1.5
						PKBASE-OT	MIT	0.0	0.0	0.0	0.0	3.0	0.1	3.0	0.1	6.0	0.2
						Subtotal		0.0	0.0	50.0	1.5	3.0	0.1	3.0	0.1	56.0	1.7
0	042.000	INVENTORYING AND MONITORING			N20	PARK-NR	MON	0.0	0.0	10.0	0.2	10.0	0.2	10.0	0.2	30.0	0.6
						NRPP	MON	0.0	0.0	20.0	0.1	0.0	0.0	0.0	0.0	20.0	0.1
						RG-NR-SCI	MON	0.0	0.0	0.0	0.0	20.0	0.1	20.0	0.1	40.0	0.2
						Subtotal		0.0	0.0	30.0	0.3	30.0	0.3	30.0	0.3	90.0	0.9
2	001.000	FIRE MANAGEMENT	185		N07	RG-NR-OTH	MON	0.0	0.0	15.0	0.3	40.0	0.5	32.0	0.4	87.0	1.2
						RG-NR-OTH	RES	0.0	0.0	20.0	0.5	20.0	0.5	0.0	0.0	40.0	1.0
						FIRE	ADM	0.0	0.0	45.0	1.0	45.0	1.0	45.0	1.0	135.0	3.0
						FIRE	MIT	0.0	0.0	20.0	0.5	20.0	0.5	20.0	0.5	60.0	1.5
						Subtotal		0.0	0.0	100.0	2.3	125.0	2.5	97.0	1.9	322.0	6.7
3	005.000	VISITOR IMPACTS ON RIPAR. COMM. IN MCKITTRICK CYN.			N22 N18	RG-NR-OTH	RES	30.0	0.2	30.0	0.2	0.0	0.0	0.0	0.0	60.0	0.4
						RG-NR-SCI	MIT	0.0	0.0	40.0	0.2	20.0	0.2	12.0	0.2	72.0	0.6
						PARK-NR	PRO	0.0	0.0	0.0	0.0	0.0	0.0	30.0	1.0	30.0	1.0
						Subtotal		30.0	0.2	70.0	0.4	20.0	0.2	42.0	1.2	162.0	2.0
4	011.000	PEREGRINE FALCON MGMT.	163		N02	RG-NR-SCI	MON	0.0	0.0	2.0	0.1	2.0	0.1	2.0	0.1	6.0	0.3
5	010.000	THREATENED & ENDANDERED SPECIES MANAGEMENT	188		N02 N03	RG-NR-SCI	MON	0.0	0.0	30.0	0.3	2.0	0.1	0.0	0.0	32.0	0.4
						RG-NR-OTH	RES	0.0	0.0	0.0	0.0	20.0	0.1	0.0	0.0	20.0	0.1
						RG-NR-SCI	RES	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.1	10.0	0.1
						Subtotal		0.0	0.0	30.0	0.3	22.0	0.2	10.0	0.1	62.0	0.6
6	018.000	VISIBILITY RESOURCES	200		N14	AIR QUAL	MON	8.5	0.2	8.5	0.2	8.5	0.2	8.5	0.2	34.0	0.8
7	033.000	DEVELOP A GEOGRAPHIC INFORMATION SYSTEM			N20	PARK-NR	ADM	0.0	0.0	20.0	0.5	20.0	0.5	20.0	0.5	60.0	1.5
						RG-NR-SCI	ADM	0.0	0.0	30.0	0.1	0.0	0.0	0.0	0.0	30.0	0.1
						Subtotal		0.0	0.0	50.0	0.6	20.0	0.5	20.0	0.5	90.0	1.6
8	037.000	WEST SIDE-VEGETATION STUDY			N20	NRPP	RES	10.0	0.1	10.0	0.1	10.0	0.1	0.0	0.0	30.0	0.3
						PARK-NR	PRO	5.0	0.1	5.0	0.1	5.0	0.1	5.0	0.1	20.0	0.4
						Subtotal		15.0	0.2	15.0	0.2	15.0	0.2	5.0	0.1	50.0	0.7

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PK PRI	PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR $$	CURRENT YEAR FTE	OUTYEAR 1 $$	OUTYEAR 1 FTE	OUTYEAR 2 $$	OUTYEAR 2 FTE	OUTYEAR 3 $$	OUTYEAR 3 FTE	TOTAL $$	TOTAL FTE
9	002.000	BACKCOUNTRY USE	192		N22	RG-NR-OTH	MIT	0.0	0.0	60.0	0.5	6.0	0.5	11.0	0.6	77.0	1.6
10	024.000	BLACK BEAR SURVEY	197		N20	No data											
11	008.000	PREDATOR POPULATIONS	166		N01	RG-NR-OTH	MON	0.0	0.0	10.0	0.5	5.0	0.5	0.0	0.0	15.0	1.0
						RG-NR-SCI	MON	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.5	5.0	0.5
						Subtotal		0.0	0.0	10.0	0.5	5.0	0.5	5.0	0.5	20.0	1.5
12	030.000	RANCHING ACTIVITIES EFFECTS ON VEGETATION			N06 N08	RG-NR-SCI	RES	0.0	0.0	10.0	0.1	10.0	0.1	0.0	0.0	20.0	0.2
13	026.000	MEXICAN SPOTTED OWL SURVEY	238		N20 N02	PARK-NR	MON	5.0	0.1	0.0	0.0	5.0	0.1	5.0	0.1	15.0	0.3
						NWASO-OTH	MON	5.0	0.1	5.0	0.1	5.0	0.1	5.0	0.1	20.0	0.4
						PARK-NR	RES	0.0	0.0	5.0	0.1	0.0	0.0	0.0	0.0	5.0	0.1
						RG-NR-SCI	RES	0.0	0.0	20.0	0.1	0.0	0.0	0.0	0.0	20.0	0.1
						Subtotal		10.0	0.2	30.0	0.3	10.0	0.2	10.0	0.2	60.0	0.9
14	021.000	NATURAL RESOURCE INFORM. DATABASE			N20	PARK-NR	ADM	0.0	0.0	5.0	0.2	15.0	0.5	15.0	0.5	35.0	1.2
						RG-NR-SCI	ADM	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	5.0	0.0
						Subtotal		0.0	0.0	5.0	0.2	20.0	0.5	15.0	0.5	40.0	1.2
15	006.000	SURFACE WATER RESOURCE	187		N11 N12	RG-NR-SCI	MON	0.0	0.0	20.0	0.2	0.0	0.0	0.0	0.0	20.0	0.2
						WATER RES	MON	0.0	0.0	0.0	0.0	15.0	0.3	0.0	0.0	15.0	0.3
						Subtotal		0.0	0.0	20.0	0.2	15.0	0.3	0.0	0.0	35.0	0.5
16	041.000	ADJACENT LAND USES			N06 N16	RG-NR-SCI	RES	0.0	0.0	8.0	0.1	8.0	0.1	0.0	0.0	16.0	0.2
						PARK-NR	PRO	0.0	0.0	5.0	0.1	0.0	0.0	0.0	0.0	5.0	0.1
						PARK-NR	MON	0.0	0.0	0.0	0.0	5.0	0.1	5.0	0.1	10.0	0.2
						Subtotal		0.0	0.0	13.0	0.2	13.0	0.2	5.0	0.1	31.0	0.5
17	034.000	DUNE GEOLOGY			N10 N20	PARK-NR	PRO	12.0	0.5	40.0	1.0	40.0	1.0	40.0	1.0	132.0	3.5
						RG-NR-SCI	RES	0.0	0.0	8.0	0.1	8.0	0.1	0.0	0.0	16.0	0.2
						PARK-NR	MON	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.1	5.0	0.1
						Subtotal		12.0	0.5	48.0	1.1	48.0	1.1	45.0	1.1	153.0	3.8

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PK PRI	PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR $$	CURRENT YEAR FTE	OUTYEAR 1 $$	OUTYEAR 1 FTE	OUTYEAR 2 $$	OUTYEAR 2 FTE	OUTYEAR 3 $$	OUTYEAR 3 FTE	TOTAL $$	TOTAL FTE
18	039.000	WEST SIDE MAMMAL SURVEY			N20	NRPP	RES	0.0	0.0	8.0	0.1	8.0	0.1	0.0	0.0	16.0	0.2
						PARK-NR	RES	0.0	0.0	2.0	0.2	2.0	0.2	0.0	0.0	4.0	0.4
						Subtotal		0.0	0.0	10.0	0.3	10.0	0.3	0.0	0.0	20.0	0.6
19	007.000	MONITOR UNGULATE HERD	171		N01 N17	RG-NR-SCI	MON	0.0	0.0	15.0	0.1	4.0	0.2	4.0	0.2	23.0	0.5
20	038.000	GEOLOGIC RESOURCES			N20	RG-NR-SCI	RES	0.0	0.0	10.0	0.1	10.0	0.1	5.0	0.1	25.0	0.3
						PARK-NR	ADM	0.0	0.0	40.0	1.0	40.0	1.0	40.0	1.0	120.0	3.0
						Subtotal		0.0	0.0	50.0	1.1	50.0	1.1	45.0	1.1	145.0	3.3
21	003.000	BACKCOUNTRY RESTORATION	77		N18	RG-NR-SCI	MIT	0.0	0.0	60.0	0.5	10.0	0.1	10.0	0.1	80.0	0.7
22	013.000	REINTRODUCTION OF MONTEZUMA QUAIL			N17	RG-NR-SCI	MIT	0.0	0.0	3.0	0.1	0.0	0.0	0.0	0.0	3.0	0.1
23	023.000	NATURAL RESOURCE MGMT. SUPPORT SERVICES			N24	No data											
24	027.000	REINTRODUCTION OF BLACKTAILED PRAIRIE DOG			N17 N06	PARK-NR	MIT	5.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.1
						PARK-NR	MON	0.0	0.0	5.0	0.1	5.0	0.1	5.0	0.1	15.0	0.3
						Subtotal		5.0	0.1	5.0	0.1	5.0	0.1	5.0	0.1	20.0	0.4
25	022.000	EXOTIC PLANT MANAGEMENT	191		N05	RG-NR-SCI	MIT	0.0	0.0	20.0	0.1	0.0	0.0	0.0	0.0	20.0	0.1
26	017.000	INTEGRATED PEST MGMT.	191		N22	No data											
27	029.000	WATER QUANTITY			N20 N12	RG-NR-SCI	MON	15.0	0.2	15.0	0.2	0.0	0.0	0.0	0.0	30.0	0.4
						PARK-NR	MON	0.0	0.0	0.0	0.0	5.0	0.1	5.0	0.1	10.0	0.2
						Subtotal		15.0	0.2	15.0	0.2	5.0	0.1	5.0	0.1	40.0	0.6
28	014.000	EXOTIC SHEEP ENCROACHMENT	164		N04	No data											

continued...

PK PRI	PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR $$	CURRENT YEAR FTE	OUTYEAR 1 $$	OUTYEAR 1 FTE	OUTYEAR 2 $$	OUTYEAR 2 FTE	OUTYEAR 3 $$	OUTYEAR 3 FTE	TOTAL $$	TOTAL FTE
29	009.000	VEGETATION UTILIZATION BY UNGULATES			N01 N04	RG-NR-SCI	RES	0.0	0.0	25.0	0.5	0.0	0.0	0.0	0.0	25.0	0.5
						PARK-NR	MON	0.0	0.0	0.0	0.0	2.0	0.1	2.0	0.1	4.0	0.2
						Subtotal		0.0	0.0	25.0	0.5	2.0	0.1	2.0	0.1	29.0	0.7
30	016.000	INSECT AND DISEASE CONTROL	191		N01	No data											
31	035.000	INSECT STUDIES			N20	RG-NR-SCI	RES	0.0	0.0	5.0	0.1	5.0	0.1	5.0	0.1	15.0	0.3
32	036.000	BIRD SURVEY			N20	No data											
33	004.000	CAVE PROTECTION AND USE			N21	PARK-NR	MON	0.0	0.0	5.0	0.2	5.0	0.2	5.0	0.1	15.0	0.5
34	032.000	REINTRODUCTION OF PRONGHORN ANTELOPE			N17	RG-NR-SCI	MIT	0.0	0.0	20.0	0.5	0.0	0.0	0.0	0.0	20.0	0.5
						PARK-NR	MON	0.0	0.0	0.0	0.0	10.0	0.3	8.0	0.1	18.0	0.4
						Subtotal		0.0	0.0	20.0	0.5	10.0	0.3	8.0	0.1	38.0	0.9
35	020.000	SCIENTIFIC COLLECTING			N20	No data											
36	031.000	METEOROLOGICAL DATA COLLECTION			N20	FIRE	MON	0.0	0.0	10.0	0.1	0.0	0.0	0.0	0.0	10.0	0.1
37	040.000	PALEONTOLOGIC RESOURCES			N23	PARK-NR	PRO	0.0	0.0	5.0	0.1	5.0	0.1	5.0	0.1	15.0	0.3
38	028.000	REMOVE EXOTIC FISH IN MCKITTRICK CANYON			N04	RG-NR-SCI	MIT	0.0	0.0	10.0	0.1	0.0	0.0	0.0	0.0	10.0	0.1
						PARK-NR	MON	0.0	0.0	0.0	0.0	5.0	0.1	5.0	0.1	10.0	0.2
						Subtotal		0.0	0.0	10.0	0.1	5.0	0.1	5.0	0.1	20.0	0.3
39	025.000	ROUTINE MAINTENANCE AFFECTING NAT. RESOURCES	83		N24	No data											
40	012.000	REINTRODUCTION OF BIGHORN SHEEP	185		N17	RG-NR-SCI	MIT	0.0	0.0	10.0	0.1	0.0	0.0	0.0	0.0	10.0	0.1
						RG-NR-SCI	MON	0.0	0.0	0.0	0.0	5.0	0.1	5.0	0.1	10.0	0.2
						Subtotal		0.0	0.0	10.0	0.1	5.0	0.1	5.0	0.1	20.0	0.3

continued...

PROGRAMMING SHEET 2
NATURAL
UNFUNDED ACTIVITIES
($ in thousands)

PK PRI	PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR $$	CURRENT YEAR FTE	OUTYEAR 1 $$	OUTYEAR 1 FTE	OUTYEAR 2 $$	OUTYEAR 2 FTE	OUTYEAR 3 $$	OUTYEAR 3 FTE	TOTAL $$	TOTAL FTE
41	019.000	OIL AND GAS DEVELOPMENT	165		N16 N06	PARK-NR	MON	0.0	0.0	2.0	0.1	1.0	0.1	2.0	0.1	5.0	0.3
						RG-NR-SCI	MON	0.0	0.0	12.0	0.2	12.0	0.2	0.0	0.0	24.0	0.4
						RG-NR-SCI	RES	0.0	0.0	0.0	0.0	18.0	0.5	18.0	0.5	36.0	1.0
						Subtotal		0.0	0.0	14.0	0.3	31.0	0.8	20.0	0.6	65.0	1.7
	42 projects printed					Grand Total		95.5	1.6	833.5	13.5	524.5	11.4	432.5	10.4	1886.0	36.9

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

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR 1992 $$	CURRENT YEAR 1992 FTE	OUTYEAR 1 1993 $$	OUTYEAR 1 1993 FTE	OUTYEAR 2 1994 $$	OUTYEAR 2 1994 FTE	OUTYEAR 3 1995 $$	OUTYEAR 3 1995 FTE	TOTAL $$	TOTAL FTE
026.000	BUTTERFIELD OVERLAND STAGE ROUTE			C10	No data											
027.000	WILLIAMS RANCH HOUSE		STRC	C05 C12	No data											
028.000	CULTURAL RESOURCE MANAGEMENT SUPPORT			C24	PARK-CR	ADM	15.0	0.3	15.0	0.3	15.0	0.3	15.0	0.3	60.0	1.2
					PKBASE-OT	INT	15.0	0.5	15.0	0.5	15.0	0.5	15.0	0.5	60.0	2.0
					Subtotal		30.0	0.8	30.0	0.8	30.0	0.8	30.0	0.8	120.0	3.2
029.000	ARCHEOLOGICAL OVERVIEW AND ASSESSMENT			C10	No data											
030.000	ARCHEOLOGICAL SURVEY OF THE WEST SIDE ADDITION		SITE	C02 C10	PARK-CR	PRO	5.0	0.1	5.0	0.1	5.0	0.1	5.0	1.0	20.0	1.3
031.000	CULTURAL SITE INVENTORY				PARK-CR	MON	2.0	0.0	2.0	0.0	2.0	0.0	2.0	0.0	8.0	0.0
032.000	GENERAL PARK HISTORY			C10	No data											
31 projects printed					Grand Total		263.0	5.0	102.0	3.0	99.0	2.9	99.0	3.8	563.0	14.7

PK PRI	PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR $$	CURRENT YEAR FTE	OUTYEAR 1 $$	OUTYEAR 1 FTE	OUTYEAR 2 $$	OUTYEAR 2 FTE	OUTYEAR 3 $$	OUTYEAR 3 FTE	TOTAL $$	TOTAL FTE
0	001.000					No data											
0	015.000	ADMINISTRATIVE HISTORY			C08	No data											
1	016.000	FRIJOLE RANCH HOUSE		STRC	C05 C12	PARK-CR	MIT	0.0	0.0	5.0	0.1	5.0	0.1	5.0	0.1	15.0	0.3
2	025.000	PINE SPRINGS CAFE		STRC	C05 C12	PARK-CR	MON	0.0	0.0	3.0	0.1	3.0	0.1	3.0	0.1	9.0	0.3
3	018.000	FRIJOLE LANDSCAPE		STRC	C11	REGN-CR	RES	0.0	0.0	10.0	0.1	0.0	0.0	0.0	0.0	10.0	0.1
4	017.000	FRIJOLE OUTBUILDINGS		STRC	C05 C12	REGN-CR	MIT	0.0	0.0	5.0	0.1	0.0	0.0	0.0	0.0	5.0	0.1
5	024.000	THE PINERY		STRC	C05 C12	PARK-CR	MIT	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.2	5.0	0.2
6	026.000	BUTTERFIELD OVERLAND STAGE ROUTE			C10	REGN-CR	RES	0.0	0.0	10.0	0.1	10.0	0.1	0.0	0.0	20.0	0.2
						PARK-CR	MIT	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.1	2.0	0.1
						Subtotal		0.0	0.0	10.0	0.1	10.0	0.1	2.0	0.1	22.0	0.3
7	029.000	ARCHEOLOGICAL OVERVIEW AND ASSESSMENT			C10	REGN-CR	RES	0.0	0.0	17.0	0.1	0.0	0.0	0.0	0.0	17.0	0.1
8	020.000	PRATT CABIN LANDSCAPE AND OUTBUILDINGS		STRC	C05 C11	REGN-CR	RES	0.0	0.0	10.0	0.1	0.0	0.0	0.0	0.0	10.0	0.1
						PARK-CR	MIT	0.0	0.0	0.0	0.0	10.0	0.3	1.0	0.0	11.0	0.3
						Subtotal		0.0	0.0	10.0	0.1	10.0	0.3	1.0	0.0	21.0	0.4
9	019.000	PRATT CABIN		STRC	C05 C12	REGN-CR	MIT	0.0	0.0	8.0	0.1	0.0	0.0	0.0	0.0	8.0	0.1
						PARK-CR	MIT	0.0	0.0	0.0	0.0	3.0	0.1	3.0	0.1	6.0	0.2
						Subtotal		0.0	0.0	8.0	0.1	3.0	0.1	3.0	0.1	14.0	0.3
10	010.000	ETHNOHISTORY OF THE MESCALERO APACHES	169	ETHN	C10	RG-NR-OTH	RES	0.0	0.0	25.0	0.1	25.0	0.1	0.0	0.0	50.0	0.2
11	022.000	SHIP-ON-THE DESERT		STRC	C05 C12	PARK-CR	MIT	0.0	0.0	2.0	0.1	2.0	0.1	2.0	0.1	6.0	0.3

continued...

PK PRI	PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR $$	CURRENT YEAR FTE	OUTYEAR 1 $$	OUTYEAR 1 FTE	OUTYEAR 2 $$	OUTYEAR 2 FTE	OUTYEAR 3 $$	OUTYEAR 3 FTE	TOTAL $$	TOTAL FTE
12	027.000	WILLIAMS RANCH HOUSE		STRC	C05 C12	PARK-CR	MIT	0.0	0.0	3.0	0.1	3.0	0.1	3.0	0.1	9.0	0.3
						REGN-CR	RES	0.0	0.0	5.0	0.1	0.0	0.0	0.0	0.0	5.0	0.1
						REGN-CR	MIT	0.0	0.0	15.0	0.5	3.0	0.1	3.0	0.1	21.0	0.7
						Subtotal		0.0	0.0	23.0	0.7	6.0	0.2	6.0	0.2	35.0	1.1
13	004.000	EFFECTS OF FIRE ON ARCHEOLOGICAL SITES		SITE	C10	REGN-CR	RES	0.0	0.0	10.0	0.5	10.0	0.5	0.0	0.0	20.0	1.0
14	032.000	GENERAL PARK HISTORY			C10	REGN-CR	RES	0.0	0.0	15.0	0.2	0.0	0.0	0.0	0.0	15.0	0.2
15	031.000	CULTURAL SITE INVENTORY				REGN-CR	RES	0.0	0.0	10.0	0.1	10.0	0.1	0.0	0.0	20.0	0.2
16	011.000	SURVEY OF HISTORIC ROADS AND ENCAMPMENTS	171	COMB	C10	REGN-CR	RES	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.5	15.0	0.5
17	008.000	HISTORIC STRUCTURE ROUTINE MAINTENANCE	181	STRC	C12	No data											
18	030.000	ARCHEOLOGICAL SURVEY OF THE WEST SIDE ADDITION		SITE	C02 C10	PARK-CR	PRO	0.0	0.0	10.0	0.2	10.0	0.2	10.0	0.2	30.0	0.6
						CRPP	RES	0.0	0.0	50.0	1.0	50.0	1.0	0.0	0.0	100.0	2.0
						REGN-CR	RES	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.1	10.0	0.1
						Subtotal		0.0	0.0	60.0	1.2	60.0	1.2	20.0	0.3	140.0	2.7
19	021.000	HUNTER LINE CABIN		STRC	C05 C12	PARK-CR	MIT	0.0	0.0	2.0	0.1	2.0	0.0	2.0	0.0	6.0	0.1
20	009.000	HISTORIC RESOURCE STUDY	196	ETHN	C01	REGN-CR	RES	0.0	0.0	0.0	0.0	15.0	0.2	0.0	0.0	15.0	0.2
21	006.000	ROCK ART STUDY	152	SITE	C02	REGN-CR	RES	0.0	0.0	2.0	0.1	2.0	0.1	0.0	0.0	4.0	0.2
22	003.000	PROTECTION OF ARCH. SITES		SITE	C19 C20	PARK-CR	PRO	0.0	0.0	5.0	0.2	5.0	0.2	5.0	0.2	15.0	0.6
23	002.000	ARCHEOLOGICAL SURVEYS OF HIGH IMPACT AREAS	190	SITE	C02	RG-NR-OTH	MIT	0.0	0.0	20.0	0.1	20.0	0.1	20.0	0.1	60.0	0.3

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PK PRI	PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR $$	CURRENT YEAR FTE	OUTYEAR 1 $$	OUTYEAR 1 FTE	OUTYEAR 2 $$	OUTYEAR 2 FTE	OUTYEAR 3 $$	OUTYEAR 3 FTE	TOTAL $$	TOTAL FTE
24	013.000	HISTORY OF MINING	172		C10	REGN-CR	RES	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.5	25.0	0.5
25	012.000	HISTORY OF RANCHING	170	ETHN	C10	REGN-CR	RES	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.4	25.0	0.4
26	023.000	SHIP-ON-THE DESERT CULTURAL LANDSCAPE		STRC	C11	REGN-CR	RES	0.0	0.0	10.0	0.1	0.0	0.0	0.0	0.0	10.0	0.1
						PARK-CR	MIT	0.0	0.0	0.0	0.0	5.0	0.2	2.0	0.1	7.0	0.3
						Subtotal		0.0	0.0	10.0	0.1	5.0	0.2	2.0	0.1	17.0	0.4
27	014.000	CULTURAL RESOURCE DATABASE	137	COMB	C02	REGN-CR	ADM	0.0	0.0	5.0	0.1	3.0	0.1	2.0	0.1	10.0	0.3
						PARK-CR	ADM	0.0	0.0	4.0	0.1	4.0	0.1	4.0	0.1	12.0	0.3
						Subtotal		0.0	0.0	9.0	0.2	7.0	0.2	6.0	0.2	22.0	0.6
28	005.000	PREHISTORIC USE OF AREAS			C10	REGN-CR	RES	0.0	0.0	25.0	0.5	0.0	0.0	0.0	0.0	25.0	0.5
29	007.000	HISTORIC STRUCTURES (LCS)	168	STRC	C01	PARK-CR	MIT	0.0	0.0	5.0	0.1	5.0	0.1	5.0	0.1	15.0	0.3
						RG-NR-OTH	RES	0.0	0.0	20.0	0.5	20.0	0.5	0.0	0.0	40.0	1.0
						Subtotal		0.0	0.0	25.0	0.6	25.0	0.6	5.0	0.1	55.0	1.3
30	028.000	CULTURAL RESOURCE MANAGEMENT SUPPORT			C24	PARK-NR	ADM	0.0	0.0	5.0	0.1	5.0	0.1	5.0	0.1	15.0	0.3
	32 projects printed					Grand Total		0.0	0.0	316.0	5.7	230.0	4.6	157.0	3.4	703.0	13.7

07/21/92
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PROGRAMMING SHEET 1
NATURAL and CULTURAL
CURRENT YEAR FUNDED ACTIVITIES
($ in thousands)

Page: 001
FY: 92
PARK: GUMO
REGION:

PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR 1992 $$	CURRENT YEAR 1992 FTE	OUTYEAR 1 1993 $$	OUTYEAR 1 1993 FTE	OUTYEAR 2 1994 $$	OUTYEAR 2 1994 FTE	OUTYEAR 3 1995 $$	OUTYEAR 3 1995 FTE	TOTAL $$	TOTAL FTE
001.000	IMPACTS OF PREVIOUS LAND USE			C13 C22	PARK-CR	ADM	3.0	0.1	3.0	0.1	0.0	0.0	0.0	0.0	6.0	0.2
					PARK-CR	MON	2.0	0.1	2.0	0.1	0.0	0.0	0.0	0.0	4.0	0.2
					Subtotal		5.0	0.2	5.0	0.2	0.0	0.0	0.0	0.0	10.0	0.4
002.000	MUSEUM COLLECTION		OBJC	C03	PARK-CR	ADM	15.0	0.5	15.0	0.5	15.0	0.5	15.0	0.5	60.0	2.0
003.000	WELL AND MINING SITE RESTORATION			N10	No data											
004.000	SOCIAL/ETHNOGRAPHIC OVERVIEW AND ASSESSMENT		ETHN	C04	No data											
4 projects printed					Grand Total		20.0	0.7	20.0	0.7	15.0	0.5	15.0	0.5	70.0	2.4

07/21/92
11:59:51

PROGRAMMING SHEET 2
NATURAL and CULTURAL
UNFUNDED ACTIVITIES
($ in thousands)

Page: 001
FY: 92
PARK: GUMO
REGION:

PK PRI	PROJECT NUMBER	PROJECT TITLE	PKG NUM	CULT RES TYPE	SYSTEM-WIDE ISSUE	FUNDING SOURCE	ACT TYP	CURRENT YEAR $$	CURRENT YEAR FTE	OUTYEAR 1 $$	OUTYEAR 1 FTE	OUTYEAR 2 $$	OUTYEAR 2 FTE	OUTYEAR 3 $$	OUTYEAR 3 FTE	TOTAL $$	TOTAL FTE
1	001.000	IMPACTS OF PREVIOUS LAND USE			C13 C22	PARK-CR	MIT	0.0	0.0	20.0	0.5	20.0	0.5	20.0	0.5	60.0	1.5
						PARK-CR	ADM	0.0	0.0	5.0	0.2	5.0	0.2	5.0	0.2	15.0	0.6
						Subtotal		0.0	0.0	25.0	0.7	25.0	0.7	25.0	0.7	75.0	2.1
2	002.000	MUSEUM COLLECTION		OBJC	C03	REGN-CR	MIT	0.0	0.0	2.0	0.1	2.0	0.1	2.0	0.1	6.0	0.3
3	004.000	SOCIAL/ETHNOGRAPHIC OVERVIEW AND ASSESSMENT		ETHN	C04	REGN-CR	RES	0.0	0.0	5.0	0.1	5.0	0.1	0.0	0.0	10.0	0.2
4	003.000	WELL AND MINING SITE RESTORATION			N10	NWASO-OTH	MIT	0.0	0.0	20.0	0.1	20.0	0.1	0.0	0.0	40.0	0.2
	4 projects printed					Grand Total		0.0	0.0	52.0	1.0	52.0	1.0	27.0	0.8	131.0	2.8

Natural Resource Management Project Statements

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-001.000

TITLE: FIRE MANAGEMENT

FUNDING STATUS: FUNDED: 127.1 UNFUNDED: 322.0

SERVICEWIDE ISSUES: N07 NAT FIRE REGM

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 185

PROBLEM STATEMENT:

Lightning fire is a natural phenomenon in the mountainous areas and surrounding plains of West Texas. Guadalupe Mountains National Park is located in a region with high cloud-to-ground lightning occurrence which, together with drought cycles and fuel loading, results in an unnatural fire interval in the various fuel types.

From 1960 to 1986, 51 fires were reported in the national park, 76 percent of which were under ten acres. Lightning had accounted for 39 fire ignitions. Fires from 1987 to 1990 totalled 28, the largest being the Frijole Fire (6,014 acres) in June, 1990. Of these, 16 were caused by lightning.

Several factors, have combined to greatly increase the potential for ignititon and for adverse fire impacts to the ecosystem. First, grazing impacts have been removed from the park. As a result, fine fuel loading in all vegetation types has had approximately 19 years to recover. Secondly, a maximum amount of heavy fuels has been allowed to accumulate due to lack of fires. When ignited, these fuels could result in much more intense fires (such as the fire behavior observed during the Frijole Fire) than would have occurred naturally. Thirdly, visitation in the national park is increasing, 192,000 visitors in 1990. It is highly probable that the park will be subjected to a notable increase in man-caused ignitions, many of which will occur under extreme environmental conditions, resulting in very large, intense and fast moving fires.

Several areas currently exist in the park where prescribed fires are critically needed. Perpetuation of the relict mixed-conifer forest in the Bowl is dependent upon reducing understory fuels which have accumulated during a 50-year fire-free period. Extensive fire history research in the Bowl area, one of the park's noted features, revealed that the average interval between major fires for the period 1696-1966 was 17 years. Restoration of natural grasslands in the low country west and east of the escarpment is also a concern.

PROJECT STATEMENT SHEET

Finally, because of fuel accumulations, the potential of wildfire occurring in the deciduous woodland of lower McKittrick Canyon presents a serious concern to this unique vegetation complex and to the water quality and biota of the creek, as well as visitor safety. Additional research is needed to determine the best means of utilizing fire as a management tool in these areas.

The park is presently operating under a Fire Management Plan approved in August, 1985. This plan has suuppression, prescribed natural fire and presecribed fire components. However, only the suppression component remains in effect until the plan can be revised to meet new policies and criteria. Revision of this plan should be completed in FY 91.

A prescribed fire program would be re-inititated in the park under the new updated Fire Management Plan. Prescribed fire would be used to reduce heavy fuels in the high country and other areas of the park with a high fuel hazard.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Revise the Fire Management Plan and implement. The revised plan would contain suppression actions, monitoring procedures for fires and prescribed natural fire and presecribed fire. Suppression actions would be consistent with region wide approved plans. It would also identify research needs for all fires.

2. INTRODUCE PRESCRIBED FIRE TO MEET MANAGEMENT OBJECTIVES: Prescribed fire would be utilized to reduce fuel loading, to restore native biotic communities, to manage fuel near facilities, park boundaries and other areas designated as critical; to manage endangered species habitat where appropriate, and to conduct fire research. Precription parameters would include fire cycle interval, as well as other standard parameters. Fire would be returned to the ecosystem, but not necessarily as a natural process. Since intervals between prescribed burns would be determined by man rather than nature, long-term natural vegetation changes related to fire return interval would be altered. The emission of gases and particulates from prescribed fires would have a minimum impact on local air quality. Portions of the park might be closed to visitor use during periods of prescribed burning.

BUDGET AND FTEs:

	FUNDED			
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	FIRE	PRO	26.7	1.0
	PARK-NR	ADM	4.0	0.1
	FIRE	MIT	1.3	0.0
	PARK-NR	MIT	3.0	0.1

PROJECT STATEMENT SHEET

		Subtotal:	35.0	1.2
Year 2:	FIRE	PRO	26.7	1.0
	PARK-NR	ADM	4.0	0.1
		Subtotal:	30.7	1.1
Year 3:	FIRE	PRO	26.7	1.0
	PARK-NR	ADM	4.0	0.1
		Subtotal:	30.7	1.1
Year 4:	FIRE	PRO	26.7	1.0
	PARK-NR	ADM	4.0	0.1
		Subtotal:	30.7	1.1
		Total:	127.1	4.5

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
	?		0.0	0.0
		Subtotal:	0.0	0.0
Year 2:	RG-NR-OTH	MON	15.0	0.3
	RG-NR-OTH	RES	20.0	0.5
	FIRE	ADM	45.0	1.0
	FIRE	MIT	20.0	0.5
		Subtotal:	100.0	2.3
Year 3:	RG-NR-OTH	MON	40.0	0.5
	FIRE	ADM	45.0	1.0
	FIRE	MIT	20.0	0.5
	RG-NR-OTH	RES	20.0	0.5
		Subtotal:	125.0	2.5
Year 4:	RG-NR-OTH	MON	32.0	0.4
	FIRE	ADM	45.0	1.0
	FIRE	MIT	20.0	0.5
		Subtotal:	97.0	1.9
		Total:	322.0	6.7

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

PROJECT STATEMENT SHEET

1. NO ACTION: Under this alternative, no fire management action would be taken. Such a program would be inconsistent with NPS policies, in violation of State regulations, and would pose a serious threat to human safety, park structures, natural and cultural resources. Conflicts could be expected when fires originating within the park burn across the boundary onto adjoining lands. Short fire return intervals and fires burning in heavy fuels under severe fire weather conditions may adversely affect vegetative communities, alter wildlife habitat, cause excessive erosion, and impair air quality.

2. SUPPRESS ALL FIRES: Complete suppression of all fires would take place under this alternative. Heavy fuel buildup will continue as a result of these suppression actions throughout the park, especially in the high country. Suppression activities would impact the park including fireline construction, erosion, slurry retardant drops and unnatural growth due to fertilization by fire retardant. Impacts on biotic communities and soils due to the inevitable occurrence of castastrophic fire would be unacceptable.

COMPLIANCE CODE(s): DOC

EXPLANATION: Fire Management Plan, Approved 1985

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-002.000

TITLE: BACKCOUNTRY USE

FUNDING STATUS: FUNDED: 146.4 UNFUNDED: 77.0

SERVICEWIDE ISSUES: N22 VIS USE-DEV ZN

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 192

PROBLEM STATEMENT:

The heart of the park - the high country and dissecting canyons of the Guadalupe escarpment - is rugged and undeveloped, providing outstanding scenery, diverse vegetation, and abundant wildlife. The approved Master Plan for Guadalupe Mountains National Park states that this area will be reserved for wilderness-type experiences including hiking, horseback riding, mountain climbing, and nature study.

In 1978, Congress established 46,850 acres of wilderness in Guadalupe Mountains National Park (60 percent of the total park acreage). The Wilderness Act of 1964, recognizes wilderness as an area "where the earth and its community of life are untrammeled by man." The Act specifies that wilderness areas will be administered to provide "outstanding opportunities for solitude or a primitive and unconfined type of recreation." The NPS Management Policies state that "in the management of wilderness resources and wilderness use, the Service will use the minimum tools necessary to successfully, safely and economically accomplish its management objectives." The specifics of backcountry management practices for the park, including the management of its designated wilderness, are detailed in the park's Backcountry Management Plan approved in 1985. This plan is in need of revision and is slated for revision.

The park's backcountry includes approximately 80 miles of improved and unimproved trails. Prior to 1980, trails consisted largely of unplanned, unmaintained routes originating prior to the establishment of the park. In 1979, a major development project to upgrade the park's trail system was initiated with the assistance of the Denver Service Center. By the end of 1984, approximately 60 miles of trail had been constructed and reconstructed. The work completed to date has been contracted to professional trail builders, and has focused primarily on ascent routes to the park's high country. The final phase of the park's trail development project, Phase IV, will be directed towards trails in the high country, and is scheduled for construction as soon as funding becomes available.

PROJECT STATEMENT SHEET

The Phase IV trail construction project is designed to be the final step in connecting the previous trail construction phases. Under this phase, the park will modify the present trail system, reroute some existing trails or delete those trails that are unmaintainable or unnecessary. Phase IV is designed to correct some existing problems with the present day trail system.

At the completion of Phase IV, the park will have deleted approximately 18 miles of trail due to realignment, deletion and additions designed to upgrade the present trail system. The park will benefit from this by having a well maintained and safe trail system that can be used by backcountry hikers and horse travelers. The park will be able to properly maintain the trails at a higher level of maintenance, thus keeping the trail from being a massive rehabilitation project each time the trail is worked on.

There are currently three established trailheads in the park - Pine Springs, McKittrick Canyon, and Dog Canyon. A decision regarding the proposed establishment of an additional trailhead on the park's west side is pending, subject to the completion and approval of the recommendations identified in the 1980 Master Plan Supplement; one of which is the addition of approximatley 10,000 acres on the park's west side.

Backcountry use has steadily increased in the park since 1971 when the area was first opened to the public and it is anticipated that further increases will occur as a result of trail improvements (4,626 total backpacker user days in 1990). Back country opportunities, including day and overnight hiking, remain the major uses of the park. Although the rugged terrain, high summer temperatures, and absence of water serve as limiting factors, Guadalupe Mountains is becoming increasingly popular as a hiker's park. Increasing numbers of recreational users concentrated in a limited area of designated trails and campsites will undoubtedly have some impact on physical and biological resources. Current park monitoring transects focus on quantifying indications of adverse impacts and overuse at campgrounds. In the late 1970's Dr. Ernest Fish, of Texas Tech University, established transects at various sites in the park to monitor the erosional impacts of recreational use and trail-related activities. Additional monitoring activities are needed to assess user impacts on vegetation, soils, and other critical resources.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Complete the Phase IV trail construction project. A fully funded Phase IV would minimize damage to the resources, add a safe trail to the Park trail system, and provide for a maintainable trail system. Scenic vistas would be added to visitor enjoyment.

PROJECT STATEMENT SHEET

2. Update the Backcountry Management Plan. The park's Backcountry Management Plan needs to be revised to reflect current visitation trends, problems, wilderness designation and management direction. This would provide an up-to-day tool for managing backcountry use and protecting park resources, as well as a public document explaining park policies and procedures.

3. Establish additional visitor use monitoring transects. Impacts of backcountry use on soils and vegetation would be monitored at additional locations througohout the park and at selected points along trails. Monitoring techniques would include transects, photopoints and site inventories. Limits of Acceptable Change (LAC) monitoring techniques by D. Cole will be used for monitoring campsites. Soil, wildlife, and vegetation would be critical indices in any monitoring scheme due to their susceptibility to impacts from concentrated visitor use. Data obtained from monitoring activities would be used to assess resource damage, determine restoration needs, evaluate management policies, to establish threshold levels for supporting any needed visitor use limits or carrying capacities and to revise the Backcountry Management Plan. Such action would permit negative trends to be recognized before irreparable damage is done to park resources.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	PRO	36.6	2.0
Year 2:	PARK-NR	PRO	36.6	2.0
Year 3:	PARK-NR	PRO	36.6	2.0
Year 4:	PARK-NR	PRO	36.6	2.0
		Total:	146.4	8.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	?		0.0	0.0
	RG-NR-OTH	MIT	60.0	0.5
		Subtotal:	60.0	0.5
Year 3:	?		0.0	0.0
	RG-NR-OTH	MIT	6.0	0.5

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	Subtotal:	6.0	0.5
Year 4:	?	0.0	0.0
	RG-NR-OTH MIT	11.0	0.6
	Subtotal:	11.0	0.6
	Total:	77.0	1.6

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action

If no action is taken, policies and procedures established in the existing Backcountry Managment Plan will not adequately address current problems, visitor use patterns, trail-related opportunities, and wilderness designation. Failure to implement specific policies for managing wilderness may lead to serious impairment of wilderness values, due either to employee ignorance or unintentional neglect. The impact of backcountry use on physical and biological resources will not be monitored, potenially resulting in disruption or change in the natural ecosystem.

COMPLIANCE CODE(s): DOC

EXPLANATION: Backcountry Mgmt. Plan, Approved 85

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-003.000

TITLE: BACKCOUNTRY RESTORATION

FUNDING STATUS: FUNDED: 60.0 UNFUNDED: 80.0

SERVICEWIDE ISSUES: N18 VIS USE-BCTRY

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 77

PROBLEM STATEMENT:

Over the last 100 years, the backcountry has been subject to various kinds of use from ranching to hunting, as well as visitor use. Many of these uses have significantly impacted the resources of the park. Meadows have been trampled, overgrazing has occurred. Other areas of concern include backcountry sites denuded of vegetation by illegal backcountry camping, social trail development, illegal fires, and illegal trash dumping sites. Abandoned roads, trails, utility corridors, old well sites, and construction sites also cause surface disturbance.

In the desert environment, these sites remain disturbed and unsightly. They cause a visual intrusion, hasten soil erosion and allow opportunities for invasion of exotics.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Man-made objects and debris should be removed, natural grades and soil layers restored, and native plant species transplanted or seeded in barren areas. This would reduce the likelihood of exotic vegetation and soil erosion and hasten the return to a natural condition. This action should be adopted to insure that disturbed areas are restored as quickly as possible to their natural condition. Soil and vegetation should be restored in disturbed areas if natural recovery does not occur within a reasonable period.

2. Photo points should be established to monitor recovery of restored sites.

BUDGET AND FTEs:

	FUNDED			
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	MIT	15.0	0.2
Year 2:	PARK-NR	MIT	15.0	0.2
Year 3:	PARK-NR	MIT	15.0	0.2

Proposal Date: 92

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Year 4:	PARK-NR	MIT	15.0	0.2
		Total:	60.0	0.8

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	?		0.0	0.0
	RG-NR-SCI	MIT	60.0	0.5
		Subtotal:	60.0	0.5
Year 3:	?		0.0	0.0
	RG-NR-SCI	MIT	10.0	0.1
		Subtotal:	10.0	0.1
Year 4:	?		0.0	0.0
	RG-NR-SCI	MIT	10.0	0.1
		Subtotal:	10.0	0.1
		Total:	80.0	0.7

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is taken to restore disturbed sites, natural recovery can be expected to be a very slow process due to the region's arid climate. Wind and water erosion on exposed sites may further aggravate disturbed conditions. Exotic plant species are likely to dominate. Failure to remove man-made objects would detract from the naturalness and aesthetic quality of the area.

COMPLIANCE CODE(s): EXCL DOC

EXPLANATION: 516 DM6 App. 7.4 C(18); B.M.Plan

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-004.000

TITLE: CAVE PROTECTION AND USE

FUNDING STATUS: FUNDED: 12.0 UNFUNDED: 15.0

SERVICEWIDE ISSUES: N21 CAVE RESOURCES

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The Guadalupe Mountains of southeast New Mexico and west Texas is known for its diverse and spectacular cave resources. Approximately 200 caves have been identified in these mountains, and geological evidence indicates that more remain to be discovered. Currently, twenty-five caves are known to exist within Guadalupe Mountains National Park.

The caves of the Guadalupe Mountains are characterized by being large in volume but small in surveyed linear distance. Glori Cave is currently the largest known cave in the park with approximately 600 feet of surveyed passage. The park's caves are generally dry, but many are decorated with delicate speleothems. Cave resources are essentially non-renewable and are particularly susceptible to human disturbance. Conversely, there is tremendous potential for human injury due to slippery substrates, sharp rocks, deep pits, and pathogenic organisms associated with caves.

The National Park Service Management Policies state that:

"The National Park Service will manage caves for the perpetuation of their natural, geological and ecological conditions, and historic association..... Caves, or portions of caves, may be closed to public use or restricted to access by conducted tours when such actions are required for human safety and the protection of cave resources. "

In the past, few park visitors have known that caves exist in the park, and discovery was unlikely due to remote cave locations and rugged terrain. However, with recent improvements in park trails, several caves are now relatively accessible. Improved access coupled with increased backcountry visitation may lead to a greater incidence of visitors discovering caves and wishing to enter them. Access to park caves has been limited, except for approved scientific or educational expeditions and for minimal administrative needs. In recent years, however, recreational cavers, caving orgaizations, and park visitors have expressed an increased interest in gaining access to wild caves administered

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by Federal land management agencies.

In May 1984, a Cave Management Plan was approved for both Carlsbad Caverns and Guadalupe Mountains National Parks. Since that time, the plan has been revised (1991) for Guadalupe Mountains National Park and is pending final approval in the region. The plan identifies the following managment objectives:

1. Protect and perpetuate natural cave systems.

2. Provide educational and recreational opportunties for a broad spectrum of park visitors (from the casully curious to the avid caver) to discover, study, respect, and enjoy the park's caves at their individual levels of interest.

3. Provide opportunities for scientific study of cave resources and systems.

4. Classify caves in management categories based on their resources and hazard characteristics.

5. Establish regulations, guidelines, and permit stipulations that ensure maximum safety for the cave visitor and preservation of park resources.

The plan institutes a major new management direction by allowing public entry in designated wild caves. A classification system is used to specify the management category, resource class, and hazard rating of each known cave. Based upon these classifications, a few wild caves in Guadalupe Mountains National Park will initially be opened to regulated visitor use. All wild cave trips will require a permit. The options remain for opening additional wild caves to public use and for requiring accompaniment by an NPS trip leader, depending on the success of the intial program.

The cave management plan also: establishes procedures for inventorying and maintaining files for all known caves, contains programs for monitoring, protecting, and restoring cave resources, outlines provisions for cave entry for research purposes, identifies training needed by staff involved in cave search and rescue, interpretation, and wild cave trips, and describes a delineation of staff responsibilities.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Implement the Cave Managment Plan: All known caves will be inventoried by the park's staff or other research volunteers. A visitor information packet will be compiled for each cave designated for regulated public access. The packet will include access instructions, a cave map, safety warnings, and regulations. These packets will be provided to visitors upon

approval of their cave use permits.

2. Complete annual revisions of the Cave Management Plan: The programs and policies established in the plan will be reviewed to determine their effectiveness and manageability. Data received from photopoint monitoring, trip reports, and case incident reports will be reviewed to assess problems and potential solutions. Recommended plan revisions will be developed and submitted to the Regional Director for approval.

3. Monitoring: Fixed photopoints will be established in wild caves designated for regulated visitor entry, as further described in the Cave Management Plan. Photographs will be taken from these points prior to implementation of the wild cave access policy, and periodically thereafter, in order to detect cave alteration or disturbance resulting from visitor use.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	PRO	3.0	0.1
Year 2:	PARK-NR	PRO	3.0	0.1
Year 3:	PARK-NR	PRO	3.0	0.1
Year 4:	PARK-NR	PRO	3.0	0.1
		Total:	12.0	0.4

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
	?		0.0	0.0
		Subtotal:	0.0	0.0
Year 2:	PARK-NR	MON	5.0	0.2
Year 3:	?		0.0	0.0
	PARK-NR	MON	5.0	0.2
	?		0.0	0.5
		Subtotal:	5.0	0.7
Year 4:	?		0.0	0.0
	PARK-NR	MON	5.0	0.1
		Subtotal:	5.0	0.1

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Total:	15.0	1.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is taken, no park visitors will gain access to any wild caves in the park. This alternative might meet with public resistence because of the present movement to access all public lands.

COMPLIANCE CODE(s): DOC

EXPLANATION: Cave Management Plan, 1991

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-005.000

TITLE: VISITOR IMPACTS ON RIPAR. COMM. IN MCKITTRICK CYN.

FUNDING STATUS: FUNDED: 200.0 UNFUNDED: 162.0

SERVICEWIDE ISSUES: N22 VIS USE-DEV ZN N18 VIS USE-BCTRY

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The McKittrick Canyon area of the park is highly prized for its scientific, scenic, and educational values. Wallace Pratt's donation to the NPS of 5,632 acres at the lower end of McKittrick Canyon served as the initial catalyst in the establishment of Guadalupe Mountains National Park.

McKittrick Canyon supports a unique and isolated riparian ecosystem in the midst of an arid region. It is the most mesic and extensive system within the Guadalupe mountain range and includes representative populations of numerous rare and endemic species. The shaded, moist, secluded habitat provided by McKittrick Creek is especially significant because of the relative scarcity of perennial streams in the area. The aquatic fauna of McKittrick Canyon is generally typical of more northerly, spring-fed streams, supporting the theory that McKittrick represents a relict biota left in isolation by the northerly retreat of montane climates. McKittrick Creek and its several associated springs and seeps produce a moderation of the canyon climate, permitting the occurrence of more water-dependent terrestrial species.

In addition to its unique biotic associations, the geologic resources of McKittrick Canyon are one of the park's principal features. The canyon cuts squarely across the axis of the Capitan barrier reef, revealing a graphic display of the reef structure. Although there are other Permian-age fossil barrier reefs in the world, few are so well exposed and accessible. The classic reef exposure at the mouth of McKittrick Canyon attracts geologists from all over the world.

Extensive research has been conducted in McKittrick Canyon. Dr. Owen Lind of Baylor University conducted limnological investigations in McKittrick Creek from 1965-1968. Tim Green of Texas A&M University, conducted a two-year invertebrate study, 1988-1990, (Final Report not yet published). Dr. Ernest Fish and his associates from Texas Tech University have completed a comprehensive hydrological inventory of the McKittrick watershed. Vegetation studies by Frederick Gehlbach, David Northington and

PROJECT STATEMENT SHEET

Tony Burgess have identified rare and endemic plant species. Limnological, hydrological, and botanical studies all reveal that McKittrick Canyon is particularly vulnerable to human impacts. Prior to the establishment of Guadalupe Mountains National Park, the isolation of McKittrick Canyon protected it from significant human disturbance. The area was maintained vertually as a wildlife refuge by its former owners. Now the canyon is highly susceptible to human disturbance due to its scenic appeal, accessibility, and the limited extent of its inviting riparian habitat. The steep canyon walls and narrow floor concentrate visitor activities in the relatively small area. Addressing this vulnerability, the approved Master Plan and Backcountry/Wilderness Management Plan state:

"Use of McKittrick Canyon will be carefully controlled to ensure that this fragile biological area is not destroyed. Access will be by road and private automobile to the mouth of the lower canyon. Only day use will be allowed."

The McKittrick drainage actually consists of three parts: South McKittrick Canyon, North McKittrick Canyon (which extends into the Lincoln National Forest), and below the confluence of the two, the main canyon. The most critical areas in terms of sensitivity to human impacts are South McKittrick Canyon between Turtle Rock and the Narrows, and the south fork of North McKittrick Canyon which contains a series of pools, seeps, and well-developed terraces. The principal water source of North McKittrick Canyon originates on the Lincoln National Forest. Recognizing that the park's limited reparian vegetation and aquatic habitat could be jeopardized by uncontrolled use or water diversions in the upper canyon, the U.S. House of Representatives' committee report recommending establishment of the park included the suggestion that:

"...there be very close cooperation between the Forest Service and the National Park Service in preserving (McKittrick Canyon) as nearly as possible in its natural condition so that students of geology, botany, and zoology, as well as other visitors to the area, may have the full benefit of this bit of wilderness. Indeed, it would be highly desirable for the two agencies to provide a unified administration for this canyon area."

The park has entered into a Memorandum of Understanding with the Lincoln National Forest for joint management of North McKittrick Canyon.

McKittrick Canyon serves as one of three major access points to the park's high country. This draws increasing numbers of backpackers into the canyon, although camping is not allowed until one ascends to the ridge top. As part of the park's recent trail development program, the trail ascending from the floor of South McKittrick Canyon to McKittrick Ridge was relocated in 1980

to curtail hiking activity in the critical canyon bottom area. Social trail development has become an issue, due to the amount of trails that have developed by hikers getting off the established trails. Rehabilitation of these social trails began in 1987 and continues to the present time.

The introduction of exotics to the delicate McKittrick ecosystem is a critical concern. Horse use is prohibited in the canyon to minimize impacts and potential sources of exotic seed.

Preservation of the natural integrity of the McKittrick drainage is dependent on long-term monitoring programs to detect changes associated with human use. Although much baseline information has been obtained since 1968, opportunities for scientific discovery and increased knowledge of the ecosystem still exist.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Management: Existing policies governing visitor and adminstrative use of McKittrick Canyon should be continued. These policies should be formalized in the McKittrick Canyon Management Plan, under preparation. This plan will minimize incidents resulting from visitor or employee ignorance, or from selective enforcement of regulations. Cooperative management of McKittrick Canyon with the Lincoln National Forest would continue, and a greater effort should be made to familiarize Forest Service personnel with visitor use and research activities, and significant resources in the joint management area.

2. Monitoring: Water quality monitoring should continue in McKittrick Creek using the sample sites and methodology established by D. H. Dasher in 1979, 1980 by Dr. Ernest Fish and the park's Resource Management Specialist in 1987. The Hach DR-EL/4 field analysis water quality test kit should be utilized to measure the following parameters: temperature, pH, nitrate-nitrogen, orthophospate, sulfates, chlorides, dissolved oxygen, total hardness, and calcium hardness. Professional assistance should be contracted on a periodic basis, if needed, to analyze and interpret the accumulated data.

When funding and manpower permit, monitoring activities should be expanded to include biological parameters in order to detect structural changes in the stream community. Prior to the implementation of such a program, it will be necessary to complete additional research investigations.

3. Continue to monitor social trail development in the canyon and continue rehab program inititated in 1987.

4. Research: A biological researcher should be contracted to develop a monitoring system to detect changes in stream community

structures. Baseline data sould be obtained to determine species composition and population densities, focusing on benthic insects, diatoms, and protozoans. A reference collection of major species should be prepared for the park. A sampling program should be developed, and a park employee trained to assume monitoring responsibilities upon termination of the research contract.

5. A program designed to monitor species diversity and population densities would be initiated to detect changes in the natural stream ecosystem associated with human use. Community structural changes would provide a means of detecting stresses that may not be identified if only chemical or physical water parameters were monitored. Tim Green's study of invertebrates in North and South McKittrick, 1988-1990, (final report not yet published) is designed to give us baseline data on invertebrates found in McKittrick Canyon. Such a program would involve regular sampling of benthic insects, diatoms, and protozoans, as well as measurements of selected water quality parameters. Effective monitoring would require a long-term commitment of manpower and funding, as well as technical training for the personnel involved.

6. Adopt Limits of Acceptable Change monitoring guidelines for documenting visitor use in the canyon and documenting their impacts.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	PRO	50.0	1.5
Year 2:	PARK-NR	PRO	50.0	1.5
Year 3:	PARK-NR	PRO	50.0	1.5
Year 4:	PARK-NR	PRO	50.0	1.5
		Total:	200.0	6.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	RG-NR-OTH	RES	30.0	0.2
Year 2:	?		0.0	0.0
	RG-NR-SCI	MIT	40.0	0.2
	RG-NR-OTH	RES	30.0	0.2
		Subtotal:	70.0	0.4

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Year 3:	?		0.0	0.0
	RG-NR-SCI	MIT	20.0	0.2
	?		0.0	0.0
		Subtotal:	20.0	0.2
Year 4:	PARK-NR	PRO	30.0	1.0
	RG-NR-SCI	MIT	12.0	0.2
		Subtotal:	42.0	1.2
		Total:	162.0	2.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is taken, existing managment policies for McKittrick Canyon will continue. These include: controlled access to the canyon; day use only; prohibition of vehicle and stock use; limitation of developed trails to the higher areas of the watershed; visitor use monitoring; and cooperative management with the Lincoln National Forest. While these measures and policies will restrict the type of use that occurs in the canyon, they fail to provide a systematic means of detecting progressive or cumulative changes in the McKittrick ecosytem that may be associated with human activities.

COMPLIANCE CODE(s): EXCL DOC

EXPLANATION: 516 DM6 App.7.4 D(1) McKittrick Pla

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-006.000

TITLE: SURFACE WATER RESOURCE

FUNDING STATUS: FUNDED: 20.0 UNFUNDED: 35.0

SERVICEWIDE ISSUES: N11 WATER QUAL-EXT N12 WATER FLOW

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 187

PROBLEM STATEMENT:

Water is a rare and valuable resource in the park. The park's water resources are in a fragile balance with the surrounding desert environment. Any activity or event (i.e. fire) that adds nutrients to the water or damages riparian communities may disturb this critical balance. Protection of limited water resources must be a primary consideration in the development and management of the park.
A water resources plan is needed for the park.

Surface water resources in the park include permanent and intermittent springs, seeps, and one perennial stream. The stream, McKittrick Creek, and its associated springs are also addressed in a separate project statement (See GUMO-N-005). Natural aquatic systems were significantly altered prior to the establishment of the park. Major springs were developed for domestic or ranching uses as evidenced by pipelines, earthen and metal tanks, guzzlers, and spring houses. There was also extensive development of artificial watering sources utilizing wells and rainfall to supply tanks for watering livestock.

An inventory of water resources was conducted in 1969, by the U.S. Geological Survey, and water quantity and qualilty of springs and wells was determined. Additional information on the chemical water quality of Smith, Mazanita, Choza, and Upper Pine Springs was obtained by Dr. Owen Lind in 1971. In 1975, the Texas Water Quality Board conducted a study of chemical and bacteriological quality of Frijole, Guadalupe, Smith, Manzanita, Choza, and Upper Pine Springs. An extensive sampling scheme for water resources was designed and implemented in 1979 by researchers from Texas Tech University. Sampling locations include nine sites in McKittrick Canyon and five major springs; Smith, Manzanita, Choza, Frijole, and Upper Pine. Sampling methods and locations were designed to permit long-term monitoring of selected water quality parameters. In 1980, sampling was continued at these sites by Texas Tech personnel until 1982. In 1987, the park reestablished a monthly water quality sampling program following Texas Tech monitoring procedures. The program is still active and no significant

changes over the last three years have been detected.

The park does not meet Level I criteria under NPS-75, Inventorying and Monitoring Guidelines, under the hydrology category. Future studies should include turbidity, stage and discharge, special use maps, and models to meet Level I, II, and III criteria.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue the monthly water quality monitoring program in the park. Parameters to be monitored include temperature, pH, nitrate-nitrogen, ortho-phosphate, sulfates, chlorides, dissolved oxygen, total hardness, and calcium hardness. Include semi-annual monitoring of natural springs along the eastern escarpment. Monthly water quality monitoring data taken from sites in McKittrick Canyon should be reviewed annually to determine trends and significant changes in the measured parameters.

2. Develop a water resources plan with help from the Denver Water Resources Division.

3. Where natural springs have been disturbed, modified, or developed for needs other than human consumption should be restored to the extent feasible. Restoration activities should include removing or dismantling tanks, check dams, and artificial catchment basins that hold or impede water flow; remove debris and organic wastes originating from human sources; and imposing temporary closures to allow natural recovery in heavily impacted areas.

4. Conduct future studies that will meet NPS-75 Guidelines, Inventorying and Monitoring Level I, II, and III criteria on hydrology.

BUDGET AND FTEs:

	FUNDED			
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	MON	5.0	0.1
Year 2:	PARK-NR	MON	5.0	0.1
Year 3:	PARK-NR	MON	5.0	0.1
Year 4:	PARK-NR	MON	5.0	0.1
		Total:	20.0	0.4

Proposal Date: 92

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	UNFUNDED			
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	?		0.0	0.0
	RG-NR-SCI	MON	20.0	0.2
		Subtotal:	20.0	0.2
Year 3:	WATER RES	MON	15.0	0.3
	?		0.0	0.0
		Subtotal:	15.0	0.3
Year 4:	?		0.0	0.0
		Total:	35.0	0.5

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: Without a long-term monitoring program, changes in the water quality of park springs will not be detected, potentially resulting in alteration of aquatic ecosystems and in human health hazards. Impacts of increased visitor use on surface water resources would not be systematically evaluated.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 B (9)

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-007.000

TITLE: MONITOR UNGULATE HERD

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 23.0

SERVICEWIDE ISSUES: N01 NAT ANML OVPOP N17 BIODIVERSITY

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 171

PROBLEM STATEMENT:

Mule deer (Odocoileus hemionus) have been major forage consumers in the park since livestock use ended in the 1960's. There has been a longstanding concern about how to manage the deer population at an optimum level while minimizing damage to park vegetation. The status of the park's deer and elk population are interrelated with a number of other resource management concerns, including; 1. the availability of water, 2. the impact of hunting outside the park boundary, 3. the balance of predatory animal populations, 4. the condition of browse species, and 5. competition for forage with other ungulate species.

During 1972, 49 vegetation transects were established in Guadalupe Mountains National Park as part of an interagency browse analysis begun in 1972. It was recommended that the browse transects should be read at five to ten-year intervals. Park personnel during the summer of 1990, read five of these transects. It is anticipated that during the near future, they will complete reading all 49 transects.

In October, 1986, the park completed and adopted its Mountain Lion Management Plan (see N-008) which made several recommendations. Principal among these was the establishment of an ungulate monitoring program (methodology) which would enable the park staff to annually generate statistically reliable data to determine population trends for its deer and elk herds. Work on this project developed under a cooperative agreement with Texas A&M University during 1987-1988. Final report has not yet been completed, but the park intends to initiate monitoring activities as soon as the methods and final report is complete.

The status and management of an introduced herd of Rocky Mountain elk (Cervus elaphus nelsoni) in the park has also received considerable attention in recent years. These elk occupy a portion of the former range of the extinct Merriam's elk (C.e. merriami), a subspecies which evolved in the semi-arid environs of the southwest. Merriam's elk was common in the Guadalupe Mountains in the 1890's, but was extirpated from its entire range by 1900. Hunting activities and the introduction of domestic

livestock contributed significantly to the disappearance of this subspecies.

A herd of 45 Rocky Mountain elk were brought in and released in McKittrick Canyon in 1929 by former landowner J.C. Hunter. The elk were transplanted from northern ranges in South Dakota and Wyoming. The mountains of northern New Mexico are considered the southern limit of the historic range of the Rocky Mountain elk.

The introduced herd grew steadily from 1929 until the late 1950's when the population peaked at approximately 350 animals. This was followed by a stable period until the late 1960's, when the population began to decline. Estimates obtained from extensive investigation of the herd by Texas Tech University researchers indicated a resident population of 125 elk in 1978 and a subsequent survey funded by the NPS indicated the 1984 population to be approximately 70 to 80 animals. The NPS contractor, Jim Carpenter, from Texas A&M University, estimated the population at 32 animals in 1990.

The decline of the elk population coincides with the establishment of the park and can be attributed to a variety of limiting factors, the most significant being the availability of water. Prior to the establishment of the park in 1972, the area was used by livestock grazing and ranching operations. Earthen tanks, man-made catchments and other methods of artificial watering sources were available. The elimination of artificial watering sources in accordance with NPS Management Policies affected the elk population. In addition to the reduction in man-made watering sources, an analysis of historic precipitation data reveals that the area has experienced several droughts, the latest, 1988-1990, affecting the elk population.

The elk population is also being affected by collisions with motor vehicles along State Highway 62/180. One breeding female a year has been killed along this state highway from 1987-1991 according to NPS records. This factor has not been investigated before, but may be an important factor in the decline of the herd.

In the past, public sentiment has played a role in the park's management of the resident elk herd. Local residents would understandably like to have the herd restored to a status where it can be hunted again. A critical lack of understanding or acceptance of the NPS mandate to perpetuate natural ecological processes has been evident both among the public and, to a lesser degree, the state wildlife management agencies. A two-year Texas A&M University research project began in 1988 and was completed in 1990, the final report will make recommendations on the future management of the elk herd.

Level I criteria is not met under NPS-75 Guidelines for

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Inventorying and Monitoring for population dyamincs. Modelling for both the mule deer and elk herd need to be developed in order to meet Level I criteria.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. The methodologies and techniques developed by the Texas A&M researcher under a NPS contract will be implemented by the park staff as an annual resource management effort to monitor the ungulate population. These techniques may include a combination of pellet-group transects, browse survey, time utilization transects and radio-telemetry monitoring. All monitoring data will be incorporated into an appropriate computer program and made available to all interested parties.

2. Upon receipt of the final elk report by Texas A&M researcher, Jim Carpenter, NPS will consider any necessary management actions.

3. Conduct furture studies that will meet Level I criteria in accordance with NPS-75, Monitoring and Inventory. These studies should include population dyanamics and modelling in order to meet Levels I, II, and III criteria in the future.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	RG-NR-SCI	MON	15.0	0.1
Year 3:	RG-NR-SCI	MON	4.0	0.2
Year 4:	RG-NR-SCI	MON	4.0	0.2
		Total:	23.0	0.5

Proposal Date: 92

GUMO-N-007.000

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(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is undertaken, it will not be possible to detect future changes in the park's mule deer and elk populations or browse conditions. This may eventually lead to habitat destruction if the ungulate population exceed the carrying capacity of the range. The lack of a consistent deer and elk census technique would necessitate a reliance upon opportunistic observations and subjective judgements both in making management decisions, and in providing input to the State regarding hunting activities outside the park.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 E(7)

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-008.000

TITLE: PREDATOR POPULATIONS

FUNDING STATUS: FUNDED: 20.0 UNFUNDED: 20.0

SERVICEWIDE ISSUES: N01 NAT ANML OVPOP

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 166

PROBLEM STATEMENT:

In 1986, the National Park Service completed a 10-year effort of managing the mountain lion problem at Guadalupe Mountains National Park. This effort culminated in the completion of a 3-year contract research project entitled: "Ecological Study of Mountain Lions in the Vicinity of Carlsbad Caverns National Park and Guadalupe Mountains National Park, Texas" and the subsequent release of specific NPS management recommendations in the Mountain Lion Management Plan and Environmental Assessment.

These documents summarized the lion issue and presented the public with ecological data concerning home ranges and movements, sex and age information for the regional lion population, and an analysis of food habits for these animals. They futher translated the research data into a set of four management recommendations the NPS would pursue in response to the lion issue. These recommendations are:

1. The continued protection of mountain lions within the boundaries of the two national parks. At the present time, there are no radio-collared mountain lions in the park.

2. The continuation of the park's lion population monitoring effort.

3. The initiation of an ungulate monitoring project.

4. The recommendation for the development of an interagency task-force to share collected data.

As a result of public comments, the NPS has implemented all elements of the plan except the task-force recommendation. Outside the national parks, the killing of mountain lions by ranchers, sportsmen, the New Mexico Department of Game and Fish, the Department of Agriculture's Animal and Plant Health Inspection Service, and illegal killing activities continues at unknown levels. Annual reprots from the New Mexico Department of Game and Fish state: The number of lions taken under the preventive control program (Unit 30 only) adjacent to the park

PROJECT STATEMENT SHEET

are as follows:

Number	Year
13	1985
13	1986
14	1987
14	1988
13	1989
9	1990

76 Mountain Lions killed over a five-year period.

All of these lions were taken in Management Unit 30 which borders our northern boundary. The number of mountain lions taken over the years affect the population in the park significantly.

The park continues to monitor mountain lions using the methods Tom Smith (Contract Biologist who completed the 3-year study) specifically developed for the park. This includes documenting scrapes, scats, and tracks. Sign observed along the mountain lion transects has dropped significantly since 1987, when it was initiated.

Other predators found in the park include the coyote (Canis latrans) and bobcat (Felis rufus). Their predator-prey relationship, and populations have not been studied.

The park does not have enough information to meet Level I criteria for mountain lion population dynamics and modelling in accordance with NPS-75, Monitoring and Inventorying Guidelines. Future studies are needed to meet Level I, II, and III criteria.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue monitoring the mountain lion population using the methods identified in the Mountain Lion Management Plan, 1986. A follow-up radio collaring project should be instituted within 10 years to give the park a comprehensive park-wide mountain lion population.

2. Continue efforts to maintain communications with all parties in the lion issue including local ranchers, State and Federal land managers, the environmental community, and the regional media. This effort is needed to dispel rumors of possible secret activities being conducted by the park and to solicit the sharing of information needed in NPS monitoring efforts.

3. Conduct a bobcat survey to gather more information on this species in the park.

4. Conduct research on the park's coyote population and its interrelationship with other species and potential adjacent land

owners.

5. Conduct future studies to meet Level I, II, and III criteria in accordance with NPS-75, Inventorying and Monitoring Guidelines on population dynamics and modelling.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	MON	5.0	0.2
Year 2:	PARK-NR	MON	5.0	0.2
Year 3:	PARK-NR	MON	5.0	0.2
Year 4:	PARK-NR	MON	5.0	0.2
		Total:	20.0	0.8

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	?		0.0	0.0
	RG-NR-OTH	MON	10.0	0.5
		Subtotal:	10.0	0.5
Year 3:	?		0.0	0.0
	RG-NR-OTH	MON	5.0	0.5
		Subtotal:	5.0	0.5
Year 4:	?		0.0	0.0
	RG-NR-SCI	MON	5.0	0.5
		Subtotal:	5.0	0.5
		Total:	20.0	1.5

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: No action on the part of the NPS will result in a recurrence of the mountain lion issue as the population of this animal is influenced by ecological and man-caused factors. The NPS will not have sufficient information to understand normal (natural) population fluctuations and to defend these animals against man-caused influences.

GUMO-N-008.000

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COMPLIANCE CODE(s): DOC

EXPLANATION: Mt. Lion Mgmt. Plan, Approved 1986

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-009.000

TITLE: VEGETATION UTILIZATION BY UNGULATES

FUNDING STATUS: FUNDED: 8.0 UNFUNDED: 29.0

SERVICEWIDE ISSUES: N01 NAT ANML OVPOP N04 NON-NAT ANIMAL

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

One of the significant features of the park is its unique vegetation mosaic, containing relict plant species from both the Rocky Mountains and Chihuahuan Desert flora. A large number of these relict plant species are considered important forage plants for mule deer (Odocoileus hemionus) and elk (Cervus elaphus nelsoni) occurring in the park. Due to the uniqueness of the park ecosystem, the interrelationship of ungulate populations with vegetative resources is a critical concern.

In 1972, an interagency browse survey was conducted in the park to inventory and map vegetation types and to determine conditions and trends in key wildlife browse areas. Survey work was completed by park personnel utilizing procedures developed in New Mexico for interagency big game habitat and analysis. Forty-nine transects were established in the park, representing four wildlife ranges: the high country, the Dog Canyon area, the east escarpment, and the west side. Evidence of heavy livestock use was still apparent during the survey, but range condition was rated medium to medium-high and an upward trend was indicated.

From 1976 to 1979, researchers from Texas Tech University were involved in extensive field investigations of ungulate populations and habitat utilization in the park. As part of this research, 47 of the browse transects established in 1973 were re-surveyed in 1979. The survey revealed that preferred browse species were being heavily utilized by mule deer and elk, allowing poor browse species to increase in abundance and diversity. Good browse species near permanent water sources showed particularly heavy use, but condition improved as distance from water increased. Poor browse species showed only light utilization, representing a virtually untapped food resource. As a result, ungulate populations could deplete preferred browse plants and switch to the less desirable spsecies without any apparent population decline. This poses a serious threat to the park's unique vegetation complex. Increased utilization of the less desirable browse species will provide an indication of declines in the range condition. During the summer of 1990, the park staff located and reread five of the interagency browse

transects. All indicated an average high reading, which means a high browse food component is available.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Management of ungulate populations should focus on continuous monitoring of vegetation conditions to detect possible browse over utilization. All established browse transects should be resurveyed as soon as possible to determine current conditions, trends, and use of park vegetation. In addition, selected transects located near critical wildlife water sources should be monitored annually to detect increased utilization of the less desirable browse species. Transect data should be evaluated to determine whether changes in the vegetation complex indicate a need for management action to regulate ungulate populations. Park staff should be trained to identify browse species and read transects near water sources, but the extensive survey of all transects should be accomplished with contract personnel. All monitoring work will be coordinated with the on-going ungulate monitoring project identified in GUMO-N-007.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	MON	2.0	0.1
Year 2:	PARK-NR	MON	2.0	0.1
Year 3:	PARK-NR	MON	2.0	0.1
Year 4:	PARK-NR	MON	2.0	0.1
		Total:	8.0	0.4

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	?		0.0	0.0
	RG-NR-SCI	RES	25.0	0.5
		Subtotal:	25.0	0.5
Year 3:	PARK-NR	MON	2.0	0.1
Year 4:	PARK-NR	MON	2.0	0.1
		Total:	29.0	0.7

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(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is undertaken, it will not be possible to correlate future changes in the park's ungulate population with impacts to park vegetation communities. This may lead to habitat destruction around permanent water sources, vegetation change, and possibly an ungulate die-off if the forage becomes so depleted that population carrying capacities drop. In the process, however, unique plant species may be lost and the aesthetic quality of the park impaired. The lack of systematic monitoring programs would necessitate a reliance upon opportunistic observations and subjective judgements in managing these resources.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 E(6)

Proposal Date: 92

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Year 4:	PARK-NR	MON	1.0	0.1
		Total:	4.0	0.4

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	?		0.0	0.0
	RG-NR-SCI	MON	30.0	0.3
		Subtotal:	30.0	0.3
Year 3:	?		0.0	0.0
	RG-NR-SCI	MON	2.0	0.1
	RG-NR-OTH	RES	20.0	0.1
		Subtotal:	22.0	0.2
Year 4:	?		0.0	0.0
	RG-NR-SCI	RES	10.0	0.1
		Subtotal:	10.0	0.1
		Total:	62.0	0.6

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If an effort to identify species "under review," or "listed" as threatened or endangered is not undertaken in the park, management will be in violation of the Endangered Species Act. It will not be possible to accurately assess the impacts of construction or development projects on these species. If, at a later date, a legally protected species is found within a disturbed or developed area, the park would have to take action to mitigate any adverse impacts. In an extreme case, this could entail a closure, a change in construction plans, or timely delays in ongoing projects.

COMPLIANCE CODE(s): ESA

EXPLANATION: Section 7 consulation under T&E Act

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-011.000

TITLE: PEREGRINE FALCON MGMT.

FUNDING STATUS: FUNDED: 4.0 UNFUNDED: 6.0

SERVICEWIDE ISSUES: N02 T&E ANIMAL

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 163

PROBLEM STATEMENT:

The American peregrine falcon (Falco peregrinus anatum) has been officially recognized as an endangered species since the enactment of the Endangered Species Act in 1973.

The presence of peregrine falcons in the area which is now Guadalupe Mountains National Park was first recorded in 1938. From 1970 through 1979, a nesting pair occupied the Peregrine Palace eyrie in the same area. This was one of the most productive eyries recorded in the United States, having produced fourteen young in a four year period (1975-1978). In 1979, the pair occupying the eyrie did not reproduce, and observations indicated that the female partner was a new bird. During both the 1980 and 1981 nesting seasons, only a lone male falcon was observed near the eyrie. From 1982 the park has monitored the Peregrine Palace eyrie location. In 1983, it was noted that a young female had paired with the male bird. These two birds failed to rear young during 1983, 1984, and 1985, but in 1986 the pair fledged a single young bird from the eyrie. In 1987, four young were reared at the eyrie, 1988, there were no young, 1989, three young were fledged, and in 1990, there were no young.

Management of the peregrine falcon is done in cooperation with the U.S. Fish and Wildlife Service under the Peregrine Falcon Recovery Plan, 1985, which provides management direction. The park continues to monitor the eyrie site starting in late February and continuing thru the month of June. An annual report on the monitoring activities as well as the results of production are written every year.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue monitoring the Peregrine Palace eyrie and/or any new eryies in the park would provide documentation of peregrine activity and reproductive success. This information would be critical in assessing the status of the park's peregrine population. However, without supplementary management activities, monitoring alone would not serve as a positive step in restoring the peregrine population.

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2. Re-establish peregrines using hacking procedures in cooperation with the U.S. Fish and Wildlife Service and the Peregrine Falcon Fund. These hacking sites would be close to abandoned sites, such as at Lloyd's Ledge near Guadalupe Peak. Logistics would be the major obstacle to overcome, because of the distance, however the existing trail system would be used.

3. Initiate research into the relationship between peregrine falcons and other birds of prey. Failure to examine the interrelationship between peregrine falcons and other raptors, particularly the great horned owl and the golden eagle will only continue lack of knowledge concerning the interrelationships of these groups.

4. A thorough survey of DDE residuals in local peregrine prey species should be conducted. Collected specimens should be sent to the U.S. Fish and Wildlife Service laboratory for analysis.

5. Continue to implement the Peregrine Falcon Plan. Revise and update this plan as necessary. Failure to carry out this action plan program will jeopardize the parks' ability to respond to the public concerning the status of the peregrine falcon within the park.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	MON	1.0	0.1
Year 2:	PARK-NR	MON	1.0	0.1
Year 3:	PARK-NR	MON	1.0	0.1
Year 4:	PARK-NR	MON	1.0	0.1
		Total:	4.0	0.4

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	?		0.0	0.0
	RG-NR-SCI	MON	2.0	0.1
		Subtotal:	2.0	0.1
Year 3:	?		0.0	0.0
	RG-NR-SCI	MON	2.0	0.1

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		Subtotal:	2.0	0.1
Year 4:	?		0.0	0.0
	RG-NR-SCI	MON	2.0	0.1
		Subtotal:	2.0	0.1
		Total:	6.0	0.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: This is not a viable alternative in that legislation mandates require a degree of effort to monitor endangered species.

COMPLIANCE CODE(s): ESA DOC

EXPLANATION: Sec. 7; T&E Act, PF Recovery Plan

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-012.000

TITLE: REINTRODUCTION OF BIGHORN SHEEP

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 20.0

SERVICEWIDE ISSUES: N17 BIODIVERSITY

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 185

PROBLEM STATEMENT:

Historically, the Guadalupe Mountains are known to have supported populations of desert bighorn sheep (Ovis canadensis mexicana). The last reliable sightings of bighorn in the park indicated that in 1938, a herd of 15 to 19 sheep were utilizing the sparsely vegetated slopes in and around McKittrick Canyon.

As in other areas of the southwest, the principle cause of decline in bighorn populations was the introduction of domestic sheep and goats on historic bighorn ranges. Over 20,000 domestic sheep were stocked on existing bighorn range in west Texas between 1939 and 1940. Several herds of over 1,000 goats were stocked in the area that is now the park. Competition for forage and transmission of diseases and parasites from domestic livestock to bighorn severely decimated the native herds.

In 1976, a feasibility study on the reintroduction of desert bighorn in the Guadalupe Mountains was conducted by wildlife biologists from Texas Tech University. A review of the habitat preferences and food requirements of bighorn indicated that the west side and the lower McKittrick drainages of the park provide ample suitable habitat and forage availablility. The amount and distribution of water in the park was identified as a potential limiting factor. Both the limited availabililty of permanent water sources and competition with other species concentrated at these water sources could jeopardize the survival of released bighorn. Although the study concluded that a reintroduction would be feasible, there are still serious questions concerning range and dietary overlap with deer, exotic barbary sheep, feral goats and domestic sheep and cattle, predation by mountain lions, and transmission of diseases and parasites from domestic stock.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. All barbary sheep, feral goats, and feral sheep found in the park should be eradicated so that a reintroduction of bighorn sheep within the park can be initiated with some hope of success. NPS manpower and funding should be contributed to the Texas Parks and Wildlife Department reintroduction program, based upon

an evaluation of their requests for assistance. Any bighorn sightings in the park should be documented and reported to appropriate state personnel.

2. A cooperative program would be developed with the state game departments to release desert bighorn in a suitable area of the park. If the released animals survive, this would restore bighorn to their historic range. Reintroduction may be adversely affected by: the abundance of deer in the park; the occurrence of barbary and mouflon sheep, feral goats, and an active predator population; the limited availability of water, neighboring livestock ranching operations, and increasing backcountry visitation. Monitoring of these activities would be necessary to evaluate impacts on bighorn sheep. A release program would necessitate an extensive allocation of park funds and manpower.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	RG-NR-SCI	MIT	10.0	0.1
Year 3:	RG-NR-SCI	MON	5.0	0.1
Year 4:	RG-NR-SCI	MON	5.0	0.1
		Total:	20.0	0.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is undertaken, desert bighorn, a native species, will not be restored to its historic range. The park ecosystem would be lacking one of its natural components and one of the most popular and elusive animal associated with remote, wildland habitats.

Proposal Date: 92

GUMO-N-012.000

PROJECT STATEMENT SHEET

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 E(7)

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-013.000

TITLE: REINTRODUCTION OF MONTEZUMA QUAIL

FUNDING STATUS: FUNDED: 4.0 UNFUNDED: 3.0

SERVICEWIDE ISSUES: N17 BIODIVERSITY

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Montezuma Quail (Cyrtonyx montezuma) were once indigenous to the Guadalupe Mountains of Texas. Ranching in the early 1900's destroyed the native grasses where Montezuma quail nested. The last remaining birds disappeared by the mid-1960's. The National Park Service reintroduced Montezuma quail at Guadalupe Mountains National Park in November, 1984.

The continuous use of this region over a period of several decades had a definite affect on the ecology of the mountains. Loss of ground cover resulting from heavy grazing is know to have a negative effect on the quail's ability to occupy a given area. It is also the commonly accepted reason as to why Montezuma quail disappeared from the Guadalupe Mountains.

Sixty quail were released on four different release dates starting in November 1984 and ending in January, 1986. Since their initial release, a total of 25 confirmed sightings of Montezuma quail have been recorded. Several of these sightings have been just north of the park on State Highway 137. A total of over 280 hours have been spent in the field by the park staff monitoring this quail since it was first released late in 1984.

A complete anaylsis should be conducted to determine if the reintroduction program was successful or not. In other areas, additional quail might have to be reintroduce to help increase the population of quail in the park. After 20 years of no grazing, habitat for this species seems to be improving. This is evident by a significant increase in wood sorrel (oxalis sp.) on Wilderness Ridge in 1989, a prime food for these quail.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue to monitor for the presence of Montezuma quail in the Dog Canyon area and document all sightings. At the end of 1992, if the success rate is minimal, efforts should be made to reintroduce more quail to increase the population already there.

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-015.000

TITLE: BOUNDARY FENCING

FUNDING STATUS: FUNDED: 40.0 UNFUNDED: 56.0

SERVICEWIDE ISSUES: N24 OTHER

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 160

PROBLEM STATEMENT:

In FY 89, the park received $150,000 to fence portions of the park boundary. The main focus was to keep out trespass livestock from destroying the park's natural resources and delineate the boundary. In 1989, five miles of boundary fence were built along the eastern and northern boundaries of the park.

In FY 90, the park received $224,000 and built 10 miles of fence along the southern boundary. Funding in FY 91 of $250,000 is anticipated to complete the project. The addition of 10,000 acres on the west side will also require fencing.

Recent changes in private land ownership adjacent to the park's west boundary is expected to result in the reintroduction of livestock to an area that has not been grazed for several years. Boundary fencing in this area is either nonexistent or extremely dilapidated. Current actions to reduce incidents of trespass grazing include boundary patrols and minor fence repair by park personnel.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. The park will continue its efforts to secure its boundaries by building new fence along its entire perimeter. As of January, 1990, the 19 year park had a boundary perimeter of 63.25 miles. The park will also secure additional funding for fencing the new 10,000 acre west side addition. Old fencing will be identified and replaced as funding is available.

2. Continue to conduct park boundary patrols using park personnel in order to identify problem areas where existing new fence has been damaged, (i.e. fire) and replacing or rehabilitation of these areas.

Proposal Date: 92

PROJECT STATEMENT SHEET

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PKBASE-OT	MIT	10.0	0.3
	?		0.0	0.5
		Subtotal:	10.0	0.8
Year 2:	PKBASE-OT	MIT	10.0	0.3
	?		0.0	0.0
		Subtotal:	10.0	0.3
Year 3:	PKBASE-OT	MIT	10.0	0.3
	?		0.0	0.0
		Subtotal:	10.0	0.3
Year 4:	PKBASE-OT	MIT	10.0	0.3
	?		0.0	0.0
		Subtotal:	10.0	0.3
		Total:	40.0	1.7

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	RG-NR-OTH	MIT	50.0	1.5
Year 3:	PKBASE-OT	MIT	3.0	0.1
Year 4:	PKBASE-OT	MIT	3.0	0.1
		Total:	56.0	1.7

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is initiated, trespass by domestic livestock will continue along sections of the west and north boundary. Trespass grazing will adversely affect plant communities and directly diminish forage for native wildlife, exerting unnatural pressures on these species. Grazing and trampling will result in accelerated erosion, damage to principle backcountry water sources, and degradation of the park's scenic values.

GUMO-N-015.000

PROJECT STATEMENT SHEET

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 C (20)

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-016.000

TITLE: INSECT AND DISEASE CONTROL

FUNDING STATUS: FUNDED: 2.0 UNFUNDED: 0.0

SERVICEWIDE ISSUES: N01 NAT ANML OVPOP

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 191

PROBLEM STATEMENT:

The vegetation mosaic of the park includes numerous shrub and forest tree species which can be expected to contain endemic populations of insects and disease pathogens, and/or to be susceptible to insect infestations and diseases either originating outside the park or caused by human activities in the park. Insect or disease damage to the mixed conifer forest in the Bowl is of particular concern due to the uniqueness and fragility of this relict community. The proximity of commercial timber lands in New Mexico's national forest must also be considered when assessing forest insect and disease problems. Within the park's designated wilderness, control activities are limited to the minimum necessary to prevent escape from the wilderness area.

The most recent insect infestation in the park occurred in 1989-1990 and involved the defoliation of Ponderosa pine (pinus ponderosa) by the southwestern dwarf mistletoe (Arcenthobium vaginatum). Previously recorded insect, plant parasite, and disease outbreaks in the park include southwestern dwarf mistletoe (Arcenthobium vaginatum), Douglas fir beetle (Dendroctonus pseudotsugae), western tent caterpillar (Malacosoma californicum), flannel moth (Megalopyga sp.), budworm (Choristoneura sp.) stem infestation of pinyon pine (Pinus edulis) by a species of Dioryctria, and a rust infection on redberry juniper (Juniperus pinchotii).

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Park vegetation will be monitored, particularly in the forested areas to detect insect or disease problems. Prompt reporting of new or unusual signs of insect or disease activity would permit early detection of potential pest problems. Early detection and monitoring would be critical in understanding the role of insects and diseases in the park ecosystem and would provide information for any necessary management actions.

2. The park will work cooperatively with other state and federal agencies to identify as quickly as possible, any outbreaks of

PROJECT STATEMENT SHEET

insect and disease so that prompt action may be taken.

BUDGET AND FTEs:

	Source	Act Type	Budget ($1000s)	FTEs
FUNDED				
Year 1:	PARK-NR	MON	0.5	0.1
Year 2:	PARK-NR	MON	0.5	0.1
Year 3:	PARK-NR	MON	0.5	0.1
Year 4:	PARK-NR	MON	0.5	0.1
		Total:	2.0	0.4
UNFUNDED				
Year 1:	?		0.0	0.0
Year 2:	?		0.0	0.0
Year 3:	?		0.0	0.0
Year 4:	?		0.0	0.0
		Total:	0.0	0.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is taken, undetected or unreported insect or disease infestations in the park may cause or contribute to the loss of native vegetation and wildlife, to human health or safety hazards and to the spread of the outbreak to neighboring lands. Natural ecosystems may be altered by infestations caused by exotic organisms or human activity.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 E(7)

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-017.000

TITLE: INTEGRATED PEST MGMT.

FUNDING STATUS: FUNDED: 16.0 UNFUNDED: 0.0

SERVICEWIDE ISSUES: N22 VIS USE-DEV ZN

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 191

PROBLEM STATEMENT:

Native insects and noxious weeds existing under natural conditions are natural elements of the park ecosystem and should be allowed to function unimpeded. However, insect and plant species considered undesirable either as a health hazard or from an aesthetic perspective often thrive in developed areas or ecosystem that have been altered by human activity. These pest species may be either native or exotic to the park.

Since 1983, the National Park Service has adopted an integrated pest management approach requiring skills and knowledge of pest management by individuals involved in pest management. This approach was initiated by the adoption of a very strict pesticide use program. The new Integrated Pest Management (IPM) approach removes habitat of the pest (piles of old wood next to a home where termites are a problem), closes up entrances uses by pest and involves a new way of thinking to solve the problem. It supports an approach of using mechanical methods before resorting to chemicals.

This program also requires that park personnel be trained in the use of IPM techniques, the careful approval and acquisition of limited pesticides in the park and a record keeping system to document pesticide use. The park is also required to maintain a restricted access pesticide storage system and maintain pesticide use logs.

Other identified pests include; the false carpenter ant (Camponotus spp.) at Pratt Cabin, white-footed mice (Peromyscus leucopus) in the NPS housing area and striped skunks (Mephitis mephitis) in the Pine Springs campground. Skunks in the campground have posed problems in the past four years. A camper was bitten in the face by a rabid skunk in 1989. Other close encounters have prompted the NPS to trap skunks in the campground and move them to another location. The skunks are live-trapped and released. These incidents generally occur during the summer, and generally involve young skunks. Campers add to the problem by dumping grease and leftovers next to their campsites. Others feed and try to touch them despite NPS efforts to warn and

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-018.000

TITLE: VISIBILITY RESOURCES

FUNDING STATUS: FUNDED: 8.0 UNFUNDED: 34.0

SERVICEWIDE ISSUES: N14 AIR POLLUTION

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 200

PROBLEM STATEMENT:

The Clean Air Act, as amended in 1977, gives the National Park Service affirmative responsibilities for protecting the parks from adverse or significant changes in air quality. Guadalupe Mountains National Park is a manadatory Class I area, as defined in the Clean Air Act. Congress established as a national goal for Class I federal areas "the prevention of any future and remedying the existing, visibility impairments resulting from manmade air pollution".

Guadalupe Mountains National Park is actively participating in monitoring visibility through the operation of a air quality monitoring station (located at Signal Peak, FFA tracking station). The monitoring station has been established on land bordering the national park and provides an unobstructed view in the direction of El Paso-Juarez industrial area and the copper smelters of southern Arizona and New Mexico, a suspected area of pollution. A 35mm camera takes visibility photos three times a day on a fixed target 55 miles west of the park. In February, 1987, prevention of significant deterioration (PSD) equipment at Signal Peak was installed to monitor ozone. An IMPROVE system was installed in 1988 and monitors sulfates, nitrates and other fine particulates. In 1989, a transimissometer was installed to measure visual ranges and detect atmospheric contrast.

In addition to the monitoring station at Signal Peak, the park is an active participant in the National Atmospheric Deposition Program (NADP). Acid rain has been monitored weekly in the park since June 1984 and provides the data needed to develop long-term trend analysis for the regional air shed.

Ken Stolte (Denver Air Quality Division) conducted a survey of ponderosa pines and Rhus trilobata shrubs, choke cherry, Gambel's oak and maples in different locations of the park. This survey was to determine if high ozone readings in 1987 had damage any conifers in the park. The result of the survey indicate that; ozone was monitored at 5500 feet and concentration at 7500 feet where most of the pines occur were much lower (due to temperature inversions); 2. any injured needles have fallen off; 3.

PROJECT STATEMENT SHEET

Ponderosa pine (var. scopulorum) in the park is more resistant to ozone than ponderosa pine (var. ponderosa) in Sequoia and Kings Canyon NP and Yosemite NP. Recommendations were made to park management concerning the need to establish long-term pine monitoring plots to obtain baseline information, fumigation studies to define species sensitivity and survey of other plants known to be sensitive to ozone damage.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue the operation of the park's monitoring station located at Signal Peak and operate the automated camera system, transimissometer, IMPROVE particulate system and ozone monitoring equipment.

2. Continue to participate in the NADP program and change rain buckets every Tuesday.

3. Research studies should focus on establishing ponderosa pine monitoring plots, lichen plots and other ozone and acid rain sensitive plants. A study is also needed to determine the affects of acid rain on cultural sites including pictographs and petroglyphs.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	MON	2.0	0.1
Year 2:	PARK-NR	MON	2.0	0.1
Year 3:	PARK-NR	MON	2.0	0.1
Year 4:	PARK-NR	MON	2.0	0.1
		Total:	8.0	0.4

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
	AIR QUAL	MON	8.5	0.2
		Subtotal:	8.5	0.2
Year 2:	?		0.0	0.0
	AIR QUAL	MON	8.5	0.2
		Subtotal:	8.5	0.2

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Year 3:	?		0.0	0.0
	AIR QUAL	MON	8.5	0.2
		Subtotal:	8.5	0.2
Year 4:	?		0.0	0.0
	AIR QUAL	MON	8.5	0.2
		Subtotal:	8.5	0.2
		Total:	34.0	0.8

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: This action implies nonconformance to the amendents of the Clean Air Act of 1977, whereby Class I areas must develop base line standards. As a Class I area, deterioration of air quality is a "significant resource problem." This alternative is considered to be unacceptable.

COMPLIANCE CODE(s): OTHER

EXPLANATION: Clean Air Act, 1977-Class I Park

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-019.000

TITLE: OIL AND GAS DEVELOPMENT

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 65.0

SERVICEWIDE ISSUES: N16 NEAR-PARK DEV N06 LAND USE PRAC

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 165

PROBLEM STATEMENT:

Oil and gas production is a significant part of the regional economy of west Texas and southeastern New Mexico. Although oil and gas exploration is prohibited within the park, oil and gas operations outside the boundary may directly affect park values and resources. Vistas from park view-points, air quality, wildlife, vegetation, water resources, and visitor activities could potentially be impacted by nearby exploration and extraction activities.

The Lincoln National Forest and Bureau of Land Management (BLM) both border the park on the northern boundary. Both agencies have recently revised their resource management plans and have withdrawn land within their control from oil and gas exploration. The Lincoln National Forest Plan recommended against oil and gas leases in the future. The BLM also recently closed 11,700 acres of land along the Texas/New Mexico border to any oil and gas exploration. This was done because of their land classification prohibited any type of surface occupancy. It was also meant to protect the highly sensitive visual area that can be viewed at key observation points along U.S. Highway 62/180.

Park management is working with the NPS Denver Mining and Minerals Division and the Texas Railroad Commission in obtaining records on mining activities and oil and gas wells drilled before the establishment of the park. Hunter Well and Pure Well on the south and west side of the park, need migitating action to permanent close off these wells.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. The park will carry out a continuing program to review proposed oil and gas operations and to monitor approved operations that may affect park resources. This will entail maintaining communications with BLM, USFS, and USGS personnel involved in mineral leasing activities. NEPA compliance documents will be prepared for all operations requiring NPS approval.

2. If any oil and gas leases are approved at the head of North

GUMO-N-020.000

PROJECT STATEMENT SHEET

EXPLANATION: 516 DM2 App. 2, 1.6

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-021.000

TITLE: NATURAL RESOURCE INFORM. DATABASE

FUNDING STATUS: FUNDED: 11.0 UNFUNDED: 40.0

SERVICEWIDE ISSUES: N20 BASELINE DATA

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Resource management practicies can only be as good as the information upon which they are based. Adequate surveys or inventories of park resources not only provice information for planning and interpretation, but are also critical tools for recognizing changes in natural ecosystems and evaluating effects of management action.

Scientific research is a vital component in the formulation of sound management policies and practicies. Since the establishement of the park, an extensive research program has been conducted involving numberous studies contracted with various universities, resource inventories conducted by NPS personnel and other government agencies, students, and knowledgeable individuals. Copies of all known park-related publications are maintained in the park library. Since 1990, the park has used a dbase program to accession and keep track of all publications in the park library.

In addition to published materials, the park's information base also includes: maps, slides, photographs, and raw data obtained from various monitoring programs, visitor use surveys and permit systems. Much of this information is not adequately organized, catalogued, or displayed to make it easily accessible. In addition, the park's bibliography needs to be updated and annotated.

The existing information base on the diverse resources available in the park is extensive. New information is continually being added as a result of contracted studies, independent research, ongoing inventory and monitoring activities, volunteer efforts and opportunistic inventories by park staff.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Use of an IBM compatible computer in the park by park personnel with a packaged or pre-tested computer program should be adopted. Publications, maps, checklists, photographs, slides and raw data should be included in the information retrieval

system. All relevant data or references should be added to or updated as new research results become available. Selected park personnel should be trained to access the computer for information retrieval.

2. Contract a research project to obtain an annotated research bibliography and include it into a computerized database.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	ADM	2.0	0.1
Year 2:	PARK-NR	ADM	3.0	0.2
Year 3:	PARK-NR	ADM	3.0	0.2
Year 4:	PARK-NR	ADM	3.0	0.2
		Total:	11.0	0.7

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	PARK-NR	ADM	5.0	0.2
Year 3:	PARK-NR	ADM	15.0	0.5
	RG-NR-SCI	ADM	5.0	0.0
		Subtotal:	20.0	0.5
Year 4:	PARK-NR	ADM	15.0	0.5
		Total:	40.0	1.2

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is undertaken, the wealth of information available on the park's natural resources will continue to be under utilized due to lack of knowledge of its existence and lack of an effective information retrieval system. Management decisions may be made without the benefit of relevant resource information.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 E(2)

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-022.000

TITLE: EXOTIC PLANT MANAGEMENT

FUNDING STATUS: FUNDED: 8.0 UNFUNDED: 20.0

SERVICEWIDE ISSUES: N05 NON-NAT PLANTS

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 191

PROBLEM STATEMENT:

Exotic, non-native plants pose the potential of becoming established in park ecosystems to the detriment of native vegetation and can ultimately disrupt natural systems severely.

At the present time, the only known non-native plant posing a significant threat to park resources is saltcedar (Tamarisk ramosissima). This exotic species has become well established in riprarian habitats and moist areas throughout the southwestern United States. It is well established in both the Rio Grande and Pecos River drainages near the park. Its impacts on water resources and plant and animal communities is well documented. Efforts at control and eradication are difficult, costly and to a large degree, ineffective once the tree becomes well established.

In the fall of 1987, park personnel cut 36 tamarisk trees at six different locations in the park. Ninety percent kill rate was recorded with complete control in 1988. In the summer of 1988, the park cut down over 100 trees with a 3" diameter or greater along Section 18. This section is not part of the park, however the park administers this land. Section 18 borders the park and there is a threat from tamarisk trees growing near the park and providing a seed source for the future spread of this exotic into park lands.

Other exotic plant species of concern include; Russian Thistle, (Salsola Kali), Johnson grass (Sorghum halepense), Chinese Elm (Ulmus pumila), Bird-of-Paradise (Calesolpinia gilliesii), Common cocklebur (Xanthium strumarium) and Common Periwinkle (Vinca minor).

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue to monitor the sites treated with Garlon 3A during 1987-1988 for any regrowth.

2. Document any regrowth with photographs and a written narrative for future references.

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3. Complete cutting and treating tamarisk trees located on Section 18 to prevent the future seed dispersal into park lands from this site.

4. Continue to monitor exotic plant species throughout the park for potential impacts on the park's natural ecosystem.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	MIT	2.0	0.1
Year 2:	PARK-NR	MIT	2.0	0.1
Year 3:	PARK-NR	MIT	2.0	0.1
Year 4:	PARK-NR	MIT	2.0	0.1
		Total:	8.0	0.4

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	?		0.0	0.0
	RG-NR-SCI	MIT	20.0	0.1
		Subtotal:	20.0	0.1
Year 3:	?		0.0	0.0
Year 4:	?		0.0	0.0
		Total:	20.0	0.1

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: Established tamarisk stands and other plant exotics will probably continue to thrive, reproduce, and spread into habitats adequate to support the species. Well established tamarisk stands could severely and irreversibly impact water sources resulting in changes to the native plant and animal communities. A significant unacceptable change in park ecosystems would result.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 E(6)

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-023.000

TITLE: NATURAL RESOURCE MGMT. SUPPORT SERVICES

FUNDING STATUS: FUNDED: 444.0 UNFUNDED: 0.0

SERVICEWIDE ISSUES: N24 OTHER

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Guadalupe Mountains National Park was established in 1966 by an Act of Congress that set aside this park as a natural area to preserve the significant resources in the park. The organic legislation for the park reads: "in order to preserve in public ownership an area in the State of Texas possessing outstanding geologic values together with scenic and other natural values of great significance." Subsequently, a significant portion of the backcountry has also been designated wilderness.

Natural resources in the park and serious concerns involve such diverse issues as wilderness management, numerous threatened and endangered species management, management of a mountain lion population and associated political impacts of this population, establishment of carrying capacities for the park's fragile desert environment, etc. The number and complexity of these issues involving the park create a significant workload for park management.

The management, planning, research, monitoring, and mitigation activities related to these diverse issues is important for the management and preservation of park resources. All of these activities must be conducted as an integral part of the overall management of the park and in compliance with laws and policy. Environmental compliance is an essential component of this program. Coordination of the park's resource management program with all divisions and all aspects of the park's operation is a must. This requires not only staff, but the support services to accomplish this complex job.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Continue to provide the necessary staff, support services and administrative activities to manage the park's natural resource management program. Insure that coordination occurs with all divisions and that all legal mandates are met.

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PROJECT STATEMENT SHEET

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	ADM	66.0	1.2
	PKBASE-OT	INT	45.0	1.4
		Subtotal:	111.0	2.6
Year 2:	PARK-NR	ADM	66.0	1.2
	PKBASE-OT	INT	45.0	1.4
		Subtotal:	111.0	2.6
Year 3:	PARK-NR	ADM	66.0	1.2
	PKBASE-OT	INT	45.0	1.4
		Subtotal:	111.0	2.6
Year 4:	PARK-NR	ADM	66.0	1.2
	PKBASE-OT	INT	45.0	1.4
		Subtotal:	111.0	2.6
		Total:	444.0	10.4

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	?		0.0	0.0
Year 3:	?		0.0	0.0
Year 4:	?		0.0	0.0
		Total:	0.0	0.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is taken, the park will continue to fall behind in generating a park wide resource management program. Other park priorities will continue to hinder the reading of transects, revegetation projects and daily resource management activities.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 515 DM6 App. 7.4 E(2)

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-024.000

TITLE: BLACK BEAR SURVEY

FUNDING STATUS: FUNDED: 2.0 UNFUNDED: 0.0

SERVICEWIDE ISSUES: N20 BASELINE DATA

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 197

PROBLEM STATEMENT:

Vernon Bailey described the black bear (Ursus americanus) of the Guadalupe Mountains in his 1905 Biological Survey, Fauna of Texas: "In the southern part of the Guadalupe Mountains, on the upper slopes of almost inaccessible canyon, black and brown bear were common in 1901.

The park has limited information on the population of black bear (Ursus americanus) that inhabit the high country of the park. No human interactions have ever been reported in the park since it was established. This is probably because of the low number of backcountry overnight users and the low numbers of black bear in the park. The park has black bear sightings dating back to 1950, when the first written documented sighting of a bear was recorded. Since then, 25 visual observations have been recorded thru 1990. The park needs information on the biology, reproduction, hibernation periods, and home ranges of the black bear in the park. In June, 1988, the park conducted a one week survey of black bear in the high country with the help of Dr. Henry McKutchen, Black Bear Specialist from Rocky Mountain National Park. He concluded that there are 2-3 resident female bear in the park. During the mating season, males from the Lincoln National Forest range through the area and mate with these females. After the mating season, the males leave the area until the following season. In November, 1988, a female sow with one cub was seen at Smith Spring. A similar sighting in June 1990, seems to support McKutchen's conclusion. The sighting in June, 1990 was accompanied by the first photograph of a black bear since the park was established.

In January, 1988, the Texas Parks and Wildlife Department listed the black bear as endangered on the state list of endangered and threatened species. The park is continuing to work closely with the Texas Parks and Wildlife Department in fostering interagency information exchange and cooperation. It is also working with the New Mexico Game and Fish Department in exchanging information on the status of black bears in areas bordering the park.

PROJECT STATEMENT SHEET

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue to monitor the existence of black bear in the park thru in-house monitoring of the high country for bear sign including scats and clawing tree markings. Continue to document visual observations of black bears and investigate suspected denning areas. Work cooperatively with universities to foster park wide studies of the black bear in the future. Research will determine the home range, reproduction, survival rate of young, and diet of the black bear; provide information needed for future management decisions.

2. Continue to work with other state and federal agencies and exchange information on the black bear.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	MON	0.5	0.0
Year 2:	PARK-NR	MON	0.5	0.0
Year 3:	PARK-NR	MON	0.5	0.0
Year 4:	PARK-NR	MON	0.5	0.0
		Total:	2.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	?		0.0	0.0
Year 3:				
Year 4:				
		Total:	0.0	0.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is taken, the park will continue to have limited information on the biology, reproduction, survival rate of young, hibernation periods, dispersal rate, diet and home range of black bear in the Guadalupe Mountains. The park will be unable to answer the public's questions on black bear using the latest available information pertainent to the black bear

PROJECT STATEMENT SHEET

population in the Guadalupe Mountains, and will have inadequate information on which to base sound management decisions.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 App. 2, 2.10

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-025.000

TITLE: ROUTINE MAINTENANCE AFFECTING NAT. RESOURCES

FUNDING STATUS: FUNDED: 380.0 UNFUNDED: 0.0

SERVICEWIDE ISSUES: N24 OTHER

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 83

PROBLEM STATEMENT:

Roads, trails, and backcountry campsites are provided to allow use of the park. These facilities are provided to provide for visitor safety and to restrict travel to designated areas. This confines, wahere necessary, resource damage to a narrow corridor as opposed to random uncontrolled use.

Routine maintenance work on these facilities is performed by the roads and trails (R&T) crew in the park. This work is necessary to maintain roads, trails and campground sites, protect facilites and structurs, portect park resources and provide for safe conditions for visitor enjoyment of the park.

Vegetation growing along road shoulders must be removed to protect the road edges from being damaged, to protect vehicles travelling the roads and assure adequate visibilitly for vehicle operators. Vegetation removal includes mowing to control vegetation and maintenance of road shoulders.

Culverts and other structures need to be cleared of debris, sand and silt to provide for better drainage and protect resources. Maintenance is required on unimproved roads in the park to maintain these roadways. This maintenance includes blading and compacting, as necessary, to stabaillize road surfaces. Ditches need to be bladed, culverts cleaned, and headers need to be stabilized.
Trail maintenance needs to be performed on a routine basis on approximately 80 miles of backcountry trails. Work needed includes, replacing step stones across creek crossings in McKittrick Canyon, picking up litter along trails, breaking up fire rings, repairing trail tread, tgrimming of vegetation alon g trails and maintaining water basrs. Trimming of vegetation needs to be more extensive along trails where horses arae peramitted in order to meet NPS trail Guidelines for horse use. Trail maintenance is intented to maintain pathways across the park which reduces environmental impactgs of the visitors on plants, soil and riparian communities and to insure safet access for park visitors.

PROJECT STATEMENT SHEET

Maintenance along the boundary feance includes: the building of new fence as funding is available, repair/replacing of fence posts and wire where it has either fallen or been cut. Drainages need to be checked for damage after heavy rainstorms to keep domestic livestock from corssing into park lands. This maintenance is needed to prevent trespass grazing and to reduce hazards to park visitors and wildlife. Guidelines for horse use. Trail maintenance is intended to minimize the environmental impacts of the trails on plants, soil and riparian communities and to insure safe access for park visitors.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue routine maintenance on roads and trails in order to provide use at safe and appropriate levels for park visitors and park employees and to maintain these facilities.

2. Continue routine maintenance on backcountry campground sites to provide for use at safe and appropriate levels for park visitors and employees.

3. Continue fence repairs and maintenance and repair/replace fencing in order to enclose the park boundary and keep out trespass livestock, and protect natural resources.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PKBASE-OT	MIT	95.0	2.5
Year 2:	PKBASE-OT	MIT	95.0	2.5
Year 3:	PKBASE-OT	MIT	95.0	2.5
Year 4:	PKBASE-OT	MIT	95.0	2.5
		Total:	380.0	10.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	?		0.0	0.0
Year 3:	?		0.0	0.0
Year 4:	?		0.0	0.0

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Total:	0.0	0.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: Under this alternative, no routine maintenance in the park would take place. This action would result in deterioration of park facilities. This would result in the trails and roads become unsafe for visitor use and staff and might result in their eventual closure.

2. Limited Cyclic Maintenance: Under this alternative, limited cyclic maintenance work would take place and would be prioritized to help alleviate the damage to natural and cultural resources. Paved road maintenance would be limited to mowing once a year, vegetation would encroach in some areas on the road, leading to breakage and costly repairs in the future. Limited maintenance would prevent visitor access to the William Ranch area. Visitor accidents, tort claims, and complaints would increase due to poor maintenance and the decline of safety standards. Park visitors would get lost in the high country due to vegetation encroachment along the trails.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 C(12)

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-026.000

TITLE: MEXICAN SPOTTED OWL SURVEY

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 60.0

SERVICEWIDE ISSUES: N20 BASELINE DATA N02 T&E ANIMAL

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 238

PROBLEM STATEMENT:

The Mexican Spotted Owl (Strix occidentalis lucida) is one of three subspecies of spotted owls that range from the Pacific Northwest to northern Mexico. This subspecies is found from northern Mexico into Colorado. Some reports estimate the population to be 400. A U.S. Forest Service report in 1988, vertified 30 nesting sites with 60 individual birds within the Lincoln National Forest.

The deep canyons and high country mixed conifer forest found withn the park makes this area an ideal habitat. Mexican Spotted Owls need old growth stands of timber in order to nest. Because of the low population numbers and loss of the old growth habitat essential to these owls, there is great concern over their status. At the present time, the U.S. Fish and Wildlife Service is considering listing this species as threatened. Spotted owls have been sighted in Guadalupe Mountains National Park and breeding is suspected, but a specific survey to determine the extent and status of the Mexican Spotted Owl has never been conducted. Recently, Lincoln National Forest biologist determined that a pair of spotted owls need 300 acres of forest for its critical habitat.

Dr. George A. Newman compiled a checklist of birds for Guadalupe Mountains National Park in 1974 and listed this species as an uncommon resident. A review of the park's wildlife records shows sightings from at least ten different locations. Several reports are from North McKittrick Canyon, within the Lincoln National Forest, approximately one-half mile from the park's boundary. Guadalupe Mountains National Park has considerable habitat where this owl might be present, especially in several drainages and in the Bowl.

A survey to determine the status of the Mexican Spotted Owl within the park is necessary in order for management to make legal and resource management action decisions.

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DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. In order to better manage the critical habitat of the Mexican Spotted Owl, a survey is necessary to determine its presence within the park boundary. A survey conducted in the spring of each year and continuing thru the summer for two years will give the National Park Service adequate data on the status of this owl. Park management needs this information in order to manage habitat areas accordingly and establish necessary closures during the critical nesting periods.

Conduct a two year study working cooperatively with the U.S. Fish and Wildlife Service. The park service would contract such a study to a bonfide researcher or graduate student to conduct the survey. Surveys would be conducted in the spring when courtship and vocalization is taking place and continue thru the summer for two years. Data obtained from such a survey would give the park baseline data so management can make legal and resource management action decisions.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	MON	5.0	0.1
	NWASO-OTH	MON	5.0	0.1
		Subtotal:	10.0	0.2
Year 2:	PARK-NR	RES	5.0	0.1
	RG-NR-SCI	RES	20.0	0.1
	NWASO-OTH	MON	5.0	0.1
		Subtotal:	30.0	0.3
Year 3:	PARK-NR	MON	5.0	0.1
	NWASO-OTH	MON	5.0	0.1

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		Subtotal:	10.0	0.2
Year 4:	PARK-NR	MON	5.0	0.1
	NWASO-OTH	MON	5.0	0.1
		Subtotal:	10.0	0.2
		Total:	60.0	0.9

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no Spotted Owls surveys are conducted, park management would not have the data needed to make legal and resource management action decisions. If, at a later date, a legally protected species is found within a disturbd or developed area, the park would have to take action to mitigate any adverse impacts. In an extreme case, this would entail a closure, a change in construction plans, or timely delays of ongoing projects.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 App. 2, 1.7

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-027.000

TITLE: REINTRODUCTION OF BLACKTAILED PRAIRIE DOG

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 20.0

SERVICEWIDE ISSUES: N17 BIODIVERSITY N06 LAND USE PRAC

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Black-tailed Prairie Dogs (Cynomys ludovicianus) have long been associated with grasslands in the west. They were historically found throughout the Trans-Pecos region, but today remain primarily on remote areas of ranches. The species was extirpated from the region through the direct activity of man. They were eradicated by means of poison because they were believed to directly complete with cattle for food.

Prairie Dogs are known to have existed within Guadalupe Mountains National Park until the mid-1960's (N. Kincaid). Several prairie dog towns existed both on the east and west sides of the park. These known areas include McKittrick Canyon, Pine Canyon and associated eastern escarpement grasslands including the Nipple Hill, Dog Canyon and on the west side near Red Well. Bailey (1905) reported seeing prairie dogs in the Guadalupe Mountains in New Mexico and into Dog Canyon in Texas. The name of this canyon was derived from the presence of this species. Geonways et al (1979) referred to the site of an abandoned town near Pine Springs where remnants of old mounds were still evident.

In the mid-sixties, the prairie dog towns were poisoned (N. Kincaid) and thus this species was removed from the park. The prairie dog was a vital component of the park ecosystem. With their disappearance other species, such as Burrowing Owl, also disappeared from the park. Restoration of the prairie dog back into the park ecosystem will restore this species to its native range, support associated species and fill a now empty niche. This will thus significantly increase the biodiversity found in the park.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Introduce Black-tailed Prairie Dog (Cynomys ludovicianus) into their historic range in the park. Male prairie dogs will be introduced to a predetermined location in the spring; females will follow after males have established sufficient burrow systems for the population to survive.

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2. Continue to monitor the release site and write up a final report on the success of the release. Monitor on a long-term basis continued and expected recovery of this population.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	MIT	5.0	0.1
Year 2:	PARK-NR	MON	5.0	0.1
Year 3:	PARK-NR	MON	5.0	0.1
Year 4:	PARK-NR	MON	5.0	0.1
		Total:	20.0	0.4

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no restoration occurs, prairie dogs will be absent from the park's ecosystem and the region's biodiversity will be that much poorer. If prairie dogs restoration is successful, this species and others dependent upon it (predators) may substantially increase biodiversity in the region.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 E (6)

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-028.000

TITLE: REMOVE EXOTIC FISH IN MCKITTRICK CANYON

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 20.0

SERVICEWIDE ISSUES: N04 NON-NAT ANIMAL

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

It is reported that there were no fish in McKittrick Canyon when it was first observed by Wallace Pratt in 1921 (Pratt, 1980). It is believed that since that time, and prior to the establishment of the park, three species of fish were planted in the stream: Yellow-belly sunfish (Lepomis auritus), green sunfish (L. cyanellus), and rainbow trout (Salmo gairdneri). Rainbows were stocked in the 1930's from a hatchery in the Missouri Ozarks according to Dr. Owen Lind, (1984).

A survey of fish conducted by Dr. Clark Hubbs in August, 1987, found only longear sunfish (Lepomis megalotis) and rainbow trout (Salmo gairdneri). Both fish are considered to be exotic, the Rainbow trout are not native to waters east of the continental divide and longear sunfish were absent or scarce 20 years ago. Green sunfish and yellow-belly sunfish had disappeared. Although severe flash floods occasionally scour the canyon, demolishing the impermeable travertine floor and dikes, fish are still present in the larger pools.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Contact professional ichthyologist to ascertain, within reasonable limits, the suspected exotic status of existing fish species (longear and rainbow trout). Work cooperatively with the U.S. Fish and Wildlife Service (Fort Worth Office), Dr. Clark Hubbs and Texas Parks and Wildlife Department, to remove exotic fish species in McKittrick Canyon.

2. The exotic fish would be eliminated by rotenone or electric-shocking and be replaced by one or more fishes likely to be native to McKittrick Creek. The prime candidates would be cutthroat trout, (Samo clarki) or Rio Grande chub, (Gila pandora). Both species occur in similar streams in southern New Mexico. The chubs are also known from Little Ajuja Creek in the Davis Mountains. Planning should incorporate consideration of aquatic invertebrates that are susceptible to rotenone.

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BUDGET AND FTEs:

	Source	Act Type	Budget ($1000s)	FTEs
FUNDED				
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0
UNFUNDED				
Year 1:	?		0.0	0.0
Year 2:	RG-NR-SCI	MIT	10.0	0.1
Year 3:	PARK-NR	MON	5.0	0.1
Year 4:	PARK-NR	MON	5.0	0.1
		Total:	20.0	0.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is taken, the park will continue to harbor exotic fish populations in McKittrick Canyon. This is contrary to what our Management Policies state and would not be a natural component of the ecological system for McKittrick Canyon.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 E(6)

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-029.000

TITLE: WATER QUANTITY

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 40.0

SERVICEWIDE ISSUES: N20 BASELINE DATA N12 WATER FLOW

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Water is a precious commodity in the Southwest. The location and sources of water and its presence is critical. Several areas in the park have flooding potential and lie within 100 and 500 year floodplains. These three areas are McKittrick Canyon, Pine Canyon and Dog Canyon. Information is needed on where these floodplains are and their effects on the land. The park needs information on the effects of irrigation in the Dell City area and the how it affects our water table. Information is also needed on the recharge cycle and how fast our recharge period is.

McKittrick Canyon Visitor Contact Station is located outside the canyon proper but could be threatened during a flooding incident. This canyon receives the heaviest visitation in the park. Mapping data could be used to install flood warning systems along the canyon to close off the canyon to hikers and evacuate the area. Mapping information can be used to delineate further development zones.

Pine Canyon flooding events would jeopardize human lives camping in the Pine Springs campground, visitors and NPS employees at the new visitor center, hikers, travelers driving on State Highway 62/180 and residents living in NPS and Texas Highway housing areas. Mapping of this floodplain would enhance the park's database, and give locations for possible installation of an early detection system to warn park visitors and residents.

Dog Canyon, located in a remote area of the park, has received several flooding events sine the establishment of the park. Several campground sites have been closed due to flooding potential. Future development in this area would be determined by floodplain information. Personnel assigned to this remote area are not always available (lieu days) to respond to a major flooding event taking place. This area with limited resoures and personnel would benefit from delineation of floodplains.

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DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Determine and map the 100 and 500 year floodplain in the park. This information is critical for future development and to protect the lives of park visitors and park employees living near these three identified areas. The mapping of the 100 and 500 year floodplain in the park would have multi-park applications to other areas in the Southwest Region. The type of limestone soils and vegetation is very typical in the Chihuahuan Desert and may include; Amistad RA, Big Bend and Carlsbad Caverns.

2. Early flooding detection systems could be installed in areas of potential flooding using is information.

3. Determine the affects irrigation in the Dell City area has on our water table and the amount of time it takes to recharge our aquifer.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	RG-NR-SCI	MON	15.0	0.2
Year 2:	RG-NR-SCI	MON	15.0	0.2
Year 3:	PARK-NR	MON	5.0	0.1
Year 4:	PARK-NR	MON	5.0	0.1
		Total:	40.0	0.6

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is initiated, the park will be lacking floodplain information. Future development might be affected during a flooding event. Property and lives might be

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affected by lack of data.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 app. 2, 1.6

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-030.000

TITLE: RANCHING ACTIVITIES EFFECTS ON VEGETATION

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 20.0

SERVICEWIDE ISSUES: N06 LAND USE PRAC N08 CULT LANDSCAPE

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Settlement of the area started in the late 1880's and by the turn of the century, cattle, sheep and goat ranches dotted the landscape.

By the early 1920's, Wallace Pratt acquired 5,000 acres at the mouth of McKittrick Canyon and managed the land as a natural preserve. Later, J.C. Hunter acquired over 72,000 acres of land and managed his land as a hunting preserve, and raised cattle, sheep and goats until the park bought his ranch in 1969. The combination of lands managed by these two individuals made up the bulk of Guadalupe Mountains National Park.

The effects of cattle, sheep and goats grazing on the land for over 40 years had significant impacts on the vegetation. Certain species including the Montezuma quail (Cyrtonyx montezumae) disappeared from this area, by 1960 due to habitat loss (N. Kincaid). Other unknown species could have also disappeared during this time, but no accurate records exist.

Information is needed on the effects of grazing on the vegetation and the recovery rates (1960-present) that have occurred since the establishment of the park. A historic perspective on the type of vegetation that existed, time periods, impacts of livestock grazing on the landscape and plant succession to the present would provide management with information on recovery/changes that have occurred and enable management to make more informal decisions relating to future vegetation management.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Conduct a vegetative plant study to determine what effects grazing had on the vegetation and the status of the vegetation after grazing has ceased to the present time.

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BUDGET AND FTEs:

	Source	Act Type	Budget ($1000s)	FTEs
FUNDED				
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0
UNFUNDED				
Year 1:	?		0.0	0.0
Year 2:	RG-NR-SCI	RES	10.0	0.1
Year 3:	RG-NR-SCI	RES	10.0	0.1
Year 4:				
		Total:	20.0	0.2

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 App. 2, 1.6

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-031.000

TITLE: METEOROLOGICAL DATA COLLECTION

FUNDING STATUS: FUNDED: 20.0 UNFUNDED: 10.0

SERVICEWIDE ISSUES: N20 BASELINE DATA

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The gathering of meteorological data has taken place in the Guadalupe's since the 1920's when the Pine Springs Cafe began gathering data for the National Weather Service. This data provides a good historic information base for the park. The park has taken over the task of collecting meterologicaal data since the establishment of the park in 1972.

Meterorological data is obtained for three primary purposes in the park: 1) for measurement of precipitation, 2) for desermining fire danger ratings, and 3) for determining weather parameters for weather service predictions (including general weather forecasts, wind warnings, etc.) and for baseline data.

Currently, the park maintains two weather stations for the National Weather Service. One has been located at the old Frijole Visitor Center and is being moved across the road to the new Pine Springs Ranger Station (move taking place in 1991). The second is maintained at the Dog Canyon Ranger Station. Bother of these stations are part of teh Agricultural Forecast System oprated out of the Lubbock, Texas, Weather Service Office. The Nataional Weatehr Service also maintains an AMOS (Automated Meteorological Observation Station) site located at Signal Peak from which the park can obtain useful information.

The park maintains a Fire Weather Station at Frijole and a RAWS (Remote Automated Weather Station) in the Bowl. Weather data read by satellite from the RAWS along with the data from teh fire weather station at Frijole are used to determine daily fire danger ratings in the park.

Dr. Ernest Fish established several recording rain guaging stations throughout the park during the period 1979-1982. These stations measured both rainfall and snow accumulations n the park. ONe of these stations was a snow guage located in the Bowl, the other was a rainfall guaging station at PX Well. The only one of these stations that is still operational is the recording rain guage at PX Well. This is a recording station and data is gathered on a monthly basis at this site.

PROJECT STATEMENT SHEET

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue to maintain weather stations at Dog Canyon, and Frijole as part of the National Weather Service data collection system. Continue to waork cooperatively with the National Weather Service to get forecasts and to access their AMOS station for additional local information.

2. Continue to operate the fire weather stations at Frijole and the RAWS station in the Bowl as part of the Fire Management Program (see project statement GUMO-N-001) and use this information to supplement other meteorological data. Finish the Fire Weather Station addition at Dog Canyon begun in 1990 to give us Fire Weather Danger information for this area of the park. Add a RAWS station on the West side in future to acquire fire weather data for this portion of the park.

3. Establish a full weather station at McKittrick and initiate daily weather readings at this site to give the park more information on both the rainfall events here, but also information on the microclimate differences in the Guadalupes.

4. Continue to maintain the rain guage recorder at PX Well.

5. All meteorological data should be filed in the resource management files as historical data and computerized for easier access.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	MON	5.0	0.1
Year 2:	PARK-NR	MON	5.0	0.1
Year 3:	PARK-NR	MON	5.0	0.1
Year 4:	PARK-NR	MON	5.0	0.1
		Total:	20.0	0.4

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	FIRE	MON	10.0	0.1
Year 3:	?		0.0	0.0

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Year 4:	?	0.0	0.0
	Total:	10.0	0.1

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is taken, valuable meterological data will be lost if data is not taken daily and according to established protocol. Data for future resource management projects will not be available. Weather trends would not be available.

COMPLIANCE CODE(s):

EXPLANATION:

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-032.000

TITLE: REINTRODUCTION OF PRONGHORN ANTELOPE

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 38.0

SERVICEWIDE ISSUES: N17 BIODIVERSITY

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Pronghorn antelope (Antilocapra americana) have long been residents of the Trans-Pecos area of Texas. At one time, antelope ranged over all of Texas west of the 97th meridian (north-south line near Dallas). Bailey (1905) reported that in the year 1900 antelope occurred all over Texas. The greatest densities were in the Trans-Pecos area of Texas with numbers said to be comparable only to that of buffalo which were estimated to be in excess of several million.

The settling of the western part of the state between 1880 and 1890 and the changes in the land use patterns brought about dramatic decreases in the antelope population. Buechner (1950) states that excessive hunting was the principal cause for the great decline of the antelope in Texas as well as other parts of North America.

Sightings in and around the park have taken place since the late 1980's. In June, 1989, several pronghorn antelope were seen near the Pine Springs campground (Basinger, 1990). The area immediately to the west and south of the park have in recent years, provided habitat for a herd of between 10-20 antelope. When the entire perimeter of the park is fenced, management hopes to reintroduce pronghorn antelope into park lands and thus restore this species to its original range.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1, Complete an analysis of range habitat requirements and prepare a reintroduction plan.

2. Conduct a survey of methods of reintroduction pronghorn antelope.

3. Work cooperatively with Texas Parks and Wildlife Department under a cooperative agreement for the reintroduction of pronghorn antelope.

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BUDGET AND FTEs:

	Source	Act Type	Budget ($1000s)	FTEs
FUNDED				
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0
UNFUNDED				
Year 1:	?		0.0	0.0
Year 2:	RG-NR-SCI	MIT	20.0	0.5
Year 3:	PARK-NR	MON	10.0	0.3
Year 4:	PARK-NR	MON	8.0	0.1
		Total:	38.0	0.9

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is initated on the reintroduction of pronghorn antelope into the park, species that were native to the area will be become part of the park's wildlife diversity. Another wildlife species, once native to the area will not be seen by park visitors within the park.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 E(6)

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-033.000

TITLE: DEVELOP A GEOGRAPHIC INFORMATION SYSTEM

FUNDING STATUS: FUNDED: 2.0 UNFUNDED: 90.0

SERVICEWIDE ISSUES: N20 BASELINE DATA

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The park's information database is growing annually from research results, maps generated by park staff, scientific collecting permit system, photographs and slides, and raw data obtained from various on-going resource management programs. This information is being computerized.

A Geographic Information System (GIS) is needed to fully utilized the park's information datebase . This GIS would allow the park to display data from the database and interrelated various themes. The GIS would store, retrieve, manipulate data, generate maps, display data on maps, overlays, graphs and other types of reports. All themes would be constructed at a scale of 1:24,000 to fit over a base map composed of 7.5 minute U.S.G.S. topographic quadrangles. Baseline information on each specific theme should include as much data as possible. Themes would include: soils, geology, hydrology, vegetation, wildlife, caves, land ownership and developed facilities.

The use of a GIS by park personnel would be expanded to provide an efficient, organized information retrieval system. Such a system would allow more frequent and effective use of resource data in park planning and decision making. Time consumed in searching for appropriate references or information would be greatly reduced and displayed in an effective manner.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Develop a GIS plan for the park.

2. Develop a Geographic Information System, (GIS). Acquire the computer hardware, staffing and software to utilize GIS capabilities and the computer system would be developed for storage, retrieval, manipulation and display of natural and cultural resources inventory data.

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BUDGET AND FTEs:

	Source	Act Type	Budget ($1000s)	FTEs
FUNDED				
Year 1:	PARK-NR	ADM	2.0	0.1
Year 2:				
Year 3:				
Year 4:				
		Total:	2.0	0.1
UNFUNDED				
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
	?		0.0	0.0
		Subtotal:	0.0	0.0
Year 2:	PARK-NR	ADM	20.0	0.5
	RG-NR-SCI	ADM	30.0	0.1
		Subtotal:	50.0	0.6
Year 3:	PARK-NR	ADM	20.0	0.5
Year 4:	PARK-NR	ADM	20.0	0.5
		Total:	90.0	1.6

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is taken, the wealth of information available on the park's natural and cultural resources will continue to be under utilized due to lack of knowledge of its existence and lack of an effective information retrieval system. Management decisions may be made without the benefit of relevant resource information.

COMPLIANCE CODE(s):

EXPLANATION:

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-034.000

TITLE: DUNE GEOLOGY

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 153.0

SERVICEWIDE ISSUES: N10 MINRL/GEOTHERM N20 BASELINE DATA

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

In 1988, Congress passed legislation authorizing the inclusion of 10,000 acres of land on the west side of the park to be included in Guadalupe Mountains National Park. The heart of this 10,000 acres is in an area of gypsum and quartzrose sand dunes that are considered to be geologically significant. This area is slated for acquisition in 1991.

The white gypsum dune field covers about 2,000 acres and is the second best example next to White Sands National Monument of a gypsum dune field in the Chihuahuan Desert. It has been designated a Texas Natural Landmark. A 2,500 acre field of more commn red quartzose dunes is northeast of the white dunes. These dunes are smaller and visually less impressive but provide an interesting contrast to the white dunes.

Little information exists on these dunes, dune formation in this area, etc. Additional information is needed to interpret this geologic story, vegetation and to manage these dunes for their preservation. In addition, little is known regarding the movement, migration, and vegetative stability of these dunes. Because this area is relatively small, it could be significantly impacted by adverse public use. Before this area is open for public access, information is needed on these dunes to be able to manage them and to prevent or stop human-caused impacts.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Conduct research into the formation of these dunes, and their movement an dmigration to provide management with baseline information prior to development in this area.

2. Develop a monitoring program to monitor dune movement, stability and human impacts, stability and human impacts to assist management in the protection of these dunes.

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BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
	PARK-NR	PRO	12.0	0.5
		Subtotal:	12.0	0.5
Year 2:	RG-NR-SCI	RES	8.0	0.1
	PARK-NR	PRO	40.0	1.0
		Subtotal:	48.0	1.1
Year 3:	RG-NR-SCI	RES	8.0	0.1
	PARK-NR	PRO	40.0	1.0
		Subtotal:	48.0	1.1
Year 4:	PARK-NR	MON	5.0	0.1
	PARK-NR	PRO	40.0	1.0
		Subtotal:	45.0	1.1
		Total:	153.0	3.8

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 App. 2, 1.6

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-035.000

TITLE: INSECT STUDIES

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 15.0

SERVICEWIDE ISSUES: N20 BASELINE DATA

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Past studies of insect populations in the park include; Foster, David E. and David D. Ralston, 1977, "Annual Report on survey of insects, Guadalupe Mountains National Park, Texas, typewritten report to the National Park Service, Southwest Region.

Knowledge of the insect populations in the park is significant baseline data that is important to obtain. Inventories of these populations are needed as well as baseline information on their new locations. Information on these species and their presence or absence are important indicators of ecosystem changes.

At the present time studies are underway including; 1) Tim Green, Texas A&M University is completing his study on the micro-invertebrates in McKittrick Canyon, 2) Dr. Edward Knutson, University of Florida, is conducting a survey of Lepidoptera in the park, (the total number of species reported in the park has increased to 985 as of 1990), 3) Dr. Richard N. Henson, Appalachian State University, is conducting on survey of scorpions, (centruroides vittatus).

These studies add to the park's baseline data and gives management information on the types of insects and the habitat in which they are found. Park staff will benefit from the information derived from these studies to better answer visitor questions and concerns.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue to conduct insect surveys as opportunties and funding allows.

2. Encourage universities to conduct these studies as part of master's and Ph degree programs. Results of this information will continue to be made available to the park staff and visitors.

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BUDGET AND FTEs:

	Source	Act Type	Budget ($1000s)	FTEs
FUNDED				
Year 1:	VOL-IN-PK	MON	0.0	0.2
Year 2:				
Year 3:				
Year 4:				
	Total:		0.0	0.2
UNFUNDED				
Year 1:	?		0.0	0.0
Year 2:	RG-NR-SCI	RES	5.0	0.1
Year 3:	RG-NR-SCI	RES	5.0	0.1
Year 4:	RG-NR-SCI	RES	5.0	0.1
	Total:		15.0	0.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If studies are not continued, valuable scientific data will be lost. Park staff will be unable to answer questions on different insects in the park.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 App. 2, 1.6

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-036.000

TITLE: BIRD SURVEY

FUNDING STATUS: FUNDED: 8.0 UNFUNDED: 0.0

SERVICEWIDE ISSUES: N20 BASELINE DATA

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Knowledge of the bird populations in the park is significant baseline data that is important to obtain. Inventories of these bird populations are needed as well as baseline information. The park does not have adequate baseline data on the bird population in the area.

At the present time, the park is participating in a bird survey. This survey is part of the Texas Breeding Bird Atlas Project, a five year endeavor to determine the breeding species and their ranges throughout the state. The project began in March 1, 1987 and will end in February 29, 1992. Some field work was accomplished in 1987 by visiting Texas A&M University students, but 1988 was the first year park staff participated in the project.

The focus of the project is to document as many breeding species as possible within each of the five different map quadrangles that make up the park before the completion date for the project. The park hopes to continue the project beyond the official completion date to further enhance nesting bird information on park specific species. Information obtained from the park will be forwarded to the state coordinator (Dr. Keith A. Arnold, Texas A&M University) and the results published in 1992.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue to conduct breeding bird survey during the year as personnel and time allows. Forward data information to the state coordinator.

2. Continue to conduct bird surveys as opportunities and funding allows. Encourage universities to conduct these studies as part of master's and Ph degree programs. Results of this information will continue to be made available to the park staff and visitors.

Proposal Date: 92

PROJECT STATEMENT SHEET

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	MON	2.0	0.1
Year 2:	PARK-NR	MON	2.0	0.1
Year 3:	PARK-NR	MON	2.0	0.1
Year 4:	PARK-NR	MON	2.0	0.1
		Total:	8.0	0.4

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	?		0.0	0.0
Year 3:	?		0.0	0.0
Year 4:	?		0.0	0.0
		Total:	0.0	0.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is taken, breeding bird data will not be gathered and valuable scientific data will be lost. Park staff will be unable to answer questions on breeding birds in the park.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 App. 2, 1.6

Proposal Date: 92

PROJECT STATEMENT SHEET

		Subtotal:	50.0	1.1
Year 3:	RG-NR-SCI	RES	10.0	0.1
	PARK-NR	ADM	40.0	1.0
		Subtotal:	50.0	1.1
Year 4:	PARK-NR	ADM	40.0	1.0
	RG-NR-SCI	RES	5.0	0.1
		Subtotal:	45.0	1.1
		Total:	145.0	3.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 App. 2, 1.6

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-039.000

TITLE: WEST SIDE MAMMAL SURVEY

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 20.0

SERVICEWIDE ISSUES: N20 BASELINE DATA

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The addition of 10,000 acres to the park's west side necessitates a comprehensive mammal survey. No complete mammal surveys exist for this area since most of this land has been in private ownership until now.

A mammal survey is needed in order to have baseline data for this new addition. This information will help park management determine the types of development and location of these developments in this new area. Information obtained from this survey will also help park interpreters answer questions on the types of mammals found in this area.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Conduct a comprehensive mammal survey of the park's new west side addition.

2. Distribute information on any new significant mammal discoveries to park staff, major universities and other local, state and federal agencies.

BUDGET AND FTEs:

	FUNDED		
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
Total:			0.0	0.0

Proposal Date: 92

PROJECT STATEMENT SHEET

	UNFUNDED			
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
	?		0.0	0.0
		Subtotal:	0.0	0.0
Year 2:	NRPP	RES	8.0	0.1
	PARK-NR	RES	2.0	0.2
		Subtotal:	10.0	0.3
Year 3:	NRPP	RES	8.0	0.1
	PARK-NR	RES	2.0	0.2
		Subtotal:	10.0	0.3
Year 4:				
		Total:	20.0	0.6

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 B(9)

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-040.000

TITLE: PALEONTOLOGIC RESOURCES

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 15.0

SERVICEWIDE ISSUES: N23 PALEONTOLOGY

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Guadalupe Mountains National Park was established because of the special geological resources that exist in the park. The Guadalupe Mountains contain the largest exposed limestone reef in the world. Because the mountains were the result of this limestone reef, the remains of many marine organisms can be found in the rock formations within the park.

These paleontologic resources range from algae, and sponges to shelled organisms. Crinoids, gastropods, cephlapods, etc. can be found in the geologic formations in the park. Recently, a geologist found the partial skeletal remains of a fish along the nature trail at the mouth of McKittrick Canyon.

Careful management of these resources is essential for their protection and preservation. Management of the scientific collecting program is an integral component of this management. When collecting permits are issued, determination needs to be made on whether a Federal Antiquities Permit is required, as well as to cover any paleontological resources that might be collected.

Any special resources discovered, such as the skeletal remains of this fish, need to be evaluated to determine the best method of protection. These resources need to be documented and a decision made on the best method of protection. Protection mesures include construction of shelters, stabilization, no action, or if necessary, collection and placement in the museum collection.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Thoroughly document any paleontological resources located in the park, including the locality, geologic setting and photographs, etc.

2. Coordinate paleontological research with geologic research to avoid duplication of efforts and limit any collecting permits to those essential to accomplish needed research and where this collecting cannot be done elsewhere.

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3. Insure that any requests for collection of paleontological resourcses comply with all applicable federal laws and regulations regarding collection of these specimens.

4. Provide for the protection of any significant paleontological resources discovered by making a determination of what if any action is necessary on a case-by-case basis and then taking the appropriate action to protect this resource. This action may be no action, stablization, construction of shelters, or the evaluation and complete documentation of the specimen with its removal and placement in the museum collection only when determined to be necessary for ultimate preservation of the specimen.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	PARK-NR	PRO	5.0	0.1
Year 3:	PARK-NR	PRO	5.0	0.1
Year 4:	PARK-NR	PRO	5.0	0.1
		Total:	15.0	0.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 App. 2, 1.7

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-041.000

TITLE: ADJACENT LAND USES

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 31.0

SERVICEWIDE ISSUES: N06 LAND USE PRAC N16 NEAR-PARK DEV

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Guadalupe Mountains National Park exists as a relatively small (86,400 acres) preserve representing only a portion of the region's ecosystem. As such the park is constantly influenced by the natural and man-influenced phenomenon occurring on neighboring lands. More often than not, man-caused impacts are a direct affront to the ecology of the park and pose a constant threat to the NPS's ability to preserve and protect the public's resources.

The geographic position of the park has created a situation where man-caused impacts can be generated by private ranching operations and State land managers in Texas and New Mexico, and the activities of the U.S. Forest Service (USFS) and Bureau of Land Management (BLM) operations in the state of New Mexico.

Oil and gas exploration occurs adjacent to the park. Gas pipelines, the AT & T communication cable, other utilities and rights-of-way either cross through or adjacent to the park. A major highway (Hwy. 62/180) runs adjacent to the park and crosses through the park at Guadalupe Peak.

In the case of air quality and visibility management, it has already been demonstrated that the park is being threatened by pollutant sources generated at considerable distances (Mexico and Arizona) within the regional airshed.

Development is occurring at an increasing rate in the El Paso area, with a related increase in visitors and needs for related services. Some development has already begun along Highway 62/180, especially on the south side of the park, with the potential for additional development to disrupt the scenic vistas of Guadalupe Peak and El Capitan. On the southern boundary of the park a development corporation has subdivided the land and created "Guadalupe Estates". They are selling plot of land adjacent to the park boundary as part of this subdivision for future development.

All of these adjacent land uses have the potential of causing

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impacts on park resources. Social trails from developments onto the park, impacts on the ground water supply, pollution to the ground water from septic systems or inadequate sewage treatments, disruption of the scenic vistas for which the park is noted, disruption of wildlife movements, and numerous other impacts could be experienced.

This portion of west Texas has little or no zoning or restrictions on development, etc. The park currently has some scenic easements on the west side but does not have any scenic easement or other interest in the lands between the highway and the scenic vista of Guadalupe Peak and El Capitan. These adjacent land uses could have significant negative impacts on the visitor experience to the park and the preservation of park resources. A land protection plan is under preparation which will address many of these issues.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Monitor adjacent land uses to detect potential impacts to park resources.

2. Park management would participate locally in the development and management of local zoning ordinances and coordination of minimizing impacts on the scenic vistas which are integral to the park experience.

3. Park management would participate with local developers in attempting to insure that any development in future subdivisions be done so as to have minimial impacts on the park and related resources such as ground water.

4. Investigate when necessary the acquisition of scenic easements and other avenues of protecting the scenic visitas for which the park is noted.

5. Implement the Land Protection Plan once it is approved.

BUDGET AND FTEs:

	FUNDED		
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:			
Year 2:			
Year 3:			
Year 4:			
Total:			0.0	0.0

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PROJECT STATEMENT SHEET

	Source	Act Type	Budget ($1000s)	FTEs
		UNFUNDED		
Year 1:	?		0.0	0.0
	?		0.0	0.0
		Subtotal:	0.0	0.0
Year 2:	RG-NR-SCI	RES	8.0	0.1
	PARK-NR	PRO	5.0	0.1
		Subtotal:	13.0	0.2
Year 3:	PARK-NR	MON	5.0	0.1
	RG-NR-SCI	RES	8.0	0.1
		Subtotal:	13.0	0.2
Year 4:	PARK-NR	MON	5.0	0.1
		Total:	31.0	0.5

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL DOC

EXPLANATION: 516 DM 6 App. 7.4 C Land Pro. Plan

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-N-042.000

TITLE: INVENTORYING AND MONITORING

FUNDING STATUS: FUNDED: 40.0 UNFUNDED: 90.0

SERVICEWIDE ISSUES: N20 BASELINE DATA

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Numerous studies have been conducted in the past designed to collect baseline data in order to have scientific information on which to base management decisions.

Although the park is relatively new (19 years old), there is enough data collected in some categories such as flora, fauna, fires, weather data etc., to meet Level I Criteria according to NPS-75 Guidelines for Inventorying and Monitoring. The park needs to compile past research information in most cases and upgrade monitoring and inventorying methods to meet Level I, Level II, and Level III criteria where deficiencies exist. The areas where deficiencies exist are listed under the Natural Baseline Information section of this plan.

Some of the criteria that the park does not meet includes; modelling under Abiotic Inventorying and Monitoring-no hydrologic or meteorologic models have not been developed for the park.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Identify areas where the park's inventorying and monitoring (I&M) criteria are not met, then identify I&M projects and programs to meet Level I, Level II, Level III, criteria in accordance with NPS-75 guidelines, and insure these needs are identified in various project statements.

2. Annually update I&M projects and programs progress.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-NR	MON	10.0	0.2
Year 2:	PARK-NR	MON	10.0	0.2
Year 3:	PARK-NR	MON	10.0	0.2

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Year 4:	PARK-NR	MON	10.0	0.2
		Total:	40.0	0.8

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
	?		0.0	0.0
		Subtotal:	0.0	0.0
Year 2:	PARK-NR	MON	10.0	0.2
	NRPP	MON	20.0	0.1
		Subtotal:	30.0	0.3
Year 3:	PARK-NR	MON	10.0	0.2
	RG-NR-SCI	MON	20.0	0.1
		Subtotal:	30.0	0.3
Year 4:	PARK-NR	MON	10.0	0.2
	RG-NR-SCI	MON	20.0	0.1
		Subtotal:	30.0	0.3
		Total:	90.0	0.9

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is taken to meet NPS-75 Guidelines on Inventorying and Monitoring (I&M), the park will fall begin the servicewide guidelines. Funding might not be available for future resource management projects due to the lack of adequate data collected from I&M projects and programs.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 app. 1, 1.6

Proposal Date: 92

Cultural Resource Management Project Statements

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-001.000

TITLE:

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 0.0

SERVICEWIDE ISSUES:

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT: N/A

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY: N/A

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s):

EXPLANATION:

Proposal Date:

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-002.000

TITLE: ARCHEOLOGICAL SURVEYS OF HIGH IMPACT AREAS

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 60.0

SERVICEWIDE ISSUES: C02 INADEQUATE INV

CULTURAL RESOURCE TYPE CODE: SITE

10-238 PACKAGE NUMBER: 190

PROBLEM STATEMENT:

Guadalupe Mountains National Park is still in the development phase having been established in 1972 (19 years). Extensive construction activities have occurred in the past and will continue to occur in the 1990's. Facility development will affect visitor use patterns and create new areas of concentrated visitor use. The National Historic Perservation Act of 1966 as ammended in 1980 and Executive Order 11593, require an up-to-date archeological survey of proposed development and high visitor impact areas. Systematic investigation of the total affected area is needed to determine potential adverse impacts on archeological resourcses and, if necessary, to develop mitigation measures.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Archeological surveys of proposed development and high visitor impact areas should be a management priority. Archeological clearance procedures will continue to be initiated as early as possible in the planning process for all proposed developments.

2. Survey high impact areas. A comprehensive archeological survey would be undertaken in high visitor use areas proposed for park facility development. This would involve systematic investigation of the entire surface area plus test excavations, surface collection and salvage archeology, if warranted. This action would fulfill legal requirements and would provide information necessary to mitigate the impacat of visitor use and developments on archeological resources.

BUDGET AND FTEs:

----------FUNDED----------

Source	Act Type	Budget ($1000s)	FTEs
Year 1:			
Year 2:			
Year 3:			

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Year 4:

	Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	RG-NR-OTH	MIT	20.0	0.1
Year 3:	RG-NR-OTH	MIT	20.0	0.1
Year 4:	RG-NR-OTH	MIT	20.0	0.1
	Total:		60.0	0.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is taken, the park will be violating Federal laws requiring archeological clearance. Archeological resources may be disturbed or lost as a result of construction or visitor activities.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 E(1)

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-003.000

TITLE: PROTECTION OF ARCH. SITES

FUNDING STATUS: FUNDED: 12.0 UNFUNDED: 15.0

SERVICEWIDE ISSUES: C19 INADEQ MONITOR C20 INADEQ SECURIT

CULTURAL RESOURCE TYPE CODE: SITE

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Affirmative action to protect and preserve archeological resources is mandated by various Federal laws and guidelines, including the Archeological Resources Protection Act of 1979, and Executive Order 11593. Due to the proximity of park roads, trails, and developed areas to archeological sites, it is important that a plan be established for protecting and preserving these resources. The need for such a plan is becoming more acute as visitation increases, particularly in the park's backcountry. The 1987 SWR Cultural Resources Regional Plan and Summary Program identified Guadalupe Mountains as 80 percent surveyed and 304 documented sites with an expected 76+ sites in the remaining 20 percent unsurveyed area.

Currently, the park programs aiding in the protection of archeological sites include: non-disclosure of site locations, public education on the value and vulnerabililty of these resources, controlling access to published reports in our park library, controlled access to caves containing archeological remains, and ranger patrols. In addition to protecting these resources from human impacts, measures are needed to prevent resurce deterioration caused by natural events. The exact extent of impacts resulting from soil erosion, burrowing animals, grazing ungulates, and wildfire is currently unknown.

During the course of the archeological inventory of the park, it was discovered that many archeological sites are disturbed by road and trails, most of which date prior to the establishment of the park. In fact, every road and trail existing in 1966 had archeological sites associated with it, revealing a basic fact of travel through the park, i.e. contemporary routes have been placed over historic roads and trails, which were placed over prehistoric routes, which presumably followed even older game routes. From the perspective of preserving cultural resources, this association has resulted in and will continue to cause problems. Measures are needed to mitigate these impacts and to prevent future construction and development activities from perpetuating these disturbances.

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In October, 1990, the State of Texas Historic Preservation Office in Austin, Texas held public meetings and nominated the McKittick Canyon Archeological District to the National Register of Historic Places. The district consists of 27 sites in the McKittrick watershed in the northeastern portions of the park. All of the sites were visited during a 1989 survey within the park by staff of the Archeological Planning and Review department of the Texas Historical Commission. Some of the sites had been previously recorded by prior archeological efforts in the park. Despite the fact that only one of the sites has been investigated by subsurface archeological work, it is believed that the sites generally date between 1000 B.C. and A.D. 1911. It is further believed that they all relate to Native American occupation/use of the Guadalupe Mountains. A final determination by the National Register is expected in FY 91.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. An archeological sites protection and preservation plan should be developed to provide a consistent management approach to these resources. The plan should describe known archeological sites; determine existing or potential threats to them; evaluate alternative methods of site protection; and identify ways to mitigate current impacts. A photo monitoring program should be included in the plan to provide documentation of human-induced impacts, as well as long-term changes in representative sites.

2. Presently, the park uses a base map developed by the SWRO that shows all known archeological sites. This map serves as important tool to look at before any projects are initiated to avoid any impacts to these sites. This map will be updated as new sites are discovered.

3. Develop a plan to provide better protection for archeological sites and guidelines for their preservation. Such a plan would provide a long-term management framework for carrying out the park's legal responsibiliites to preserve archeological resources.

BUDGET AND FTEs:

	FUNDED			
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-CR	PRO	3.0	0.1
Year 2:	PARK-CR	PRO	3.0	0.1
Year 3:	PARK-CR	PRO	3.0	0.1
Year 4:	PARK-CR	PRO	3.0	0.1

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		Total:	12.0	0.4

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	PARK-CR	PRO	5.0	0.2
Year 3:	PARK-CR	PRO	5.0	0.2
Year 4:	PARK-CR	PRO	5.0	0.2
		Total:	15.0	0.6

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: Without additional measures to protect the park's archeological resources, the potential will continue to exist for sites to be destroyed or disturbed by park visitors, park operations, wildlife, and weathering processes. Adherence to legal requirements for the preservation of archeological resources will not be complete.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 App. 2, 1.5

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-004.000

TITLE: EFFECTS OF FIRE ON ARCHEOLOGICAL SITES

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 20.0

SERVICEWIDE ISSUES: C10 SPECIAL STUDY

CULTURAL RESOURCE TYPE CODE: SITE

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Fire history studies indicate that natural and perhaps, man-caused fires have burned over many of the park's archeological sites for hundreds to thousands of years. The precise impact to these fires is not known. Midden rings are probably the primary type of archeological site that would be affected by fire. The effects of fire in terms of damage and/or alteration of archeological resources needs to be evaluated. This is particularly important since the park had adopted a new fire management polilcy involving presribed burns and presribed natural fires (see GUMO-N-001 Fire Management). The park Fire Management Plan was approved in 1985. The park is presently revising the Fire Management Plan and should be completed in FY 91.

After the Frijole Fire which started in June, 1990 and burned 6,014 acres, several midden rings were found immediately after the fire.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Prior to any prescribed burning, an archeological survey of the proposed burn area should be conducted. This will allow for later monitoring of the effects of burning, or will facilitate the deletion of archeological sites from the burn area.

2. A comprehensive survey of the Frijole Fire site is needed to locate and identify any exposed archeological sites in the burned area before the vegetation encroaches on it.

3. Research results from other agencies and areas should be studied for possible local application. An assessment should be made from this information to make an action plan to manage or mitigate any potential resource damage that may be caused by fire, especially prescribed burning. Archeological base maps on 7.5 topographic maps should be utilized by fire management personnel and used to avoid damage that would result from suppression activities.

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BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	REGN-CR	RES	10.0	0.5
Year 3:	REGN-CR	RES	10.0	0.5
Year 4:				
		Total:	20.0	1.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is initiated, the effects of fires burning over archeological sites will not be fully understood. This lack of knowledge will hinder enlightened decisions regarding the appropriateness of prescribed fire in areas where recorded archeological sites are located. Archeological resources may be damaged or altered by fire.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 B

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-005.000

TITLE: PREHISTORIC USE OF AREAS

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 25.0

SERVICEWIDE ISSUES: C10 SPECIAL STUDY

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The extensive archeological survey of the park conducted in the 1970's raised many questions concerning prehistoric use of the area. Publications by Katz (1978), Katz and Katz (1979) and Bradford (1980), and Katz and Katz (1985) provide considerable information and analytical interpretation of prehistoric occupation; however, many related topics remain for investigation. Several specific areas in the park exhibit evidence of intense utilization on a short-term basis. It is hypothesized that park sites were utilized seasonally for hunting and foraging activities, but that the foragers returned to a base camp or village, possibly located west of the park in the Dell Valley. Controlled excavation or surface collecting at selected sites may be appropriate to resolve questions, test hypothesis, and provide further interpretation.

The addition of 10,000 acres on the west side approved by Congress in 1988 adds another need to work in this specific area. The gypsum and rose quartz dunes on the west side are considered to be rich in prehistoric sites. An intensive survey of these area needs to be conducted in order to interpret the site and provide protection of these sites, once the area becomes open to the public.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Research would be conducted to provide further interpretation of the different types of archeological sites located in the park, site functions, specific subsistence activities, and environmental changes. Controlled excavation and surface collecting should be included in such studies. After testing, disturbed areas should be restored as much as possible to their natural condition.

Conduct excavations and surface collecting would determine the presence of additional cultural material that may aid in our understanding of prehistoric occupants. Information obtained from these studies would be useful in developing informative and accurate interpretive programs. Surface disturbance would occur

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in selected sites during such studies.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	REGN-CR	RES	25.0	0.5
Year 3:				
Year 4:				
		Total:	25.0	0.5

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is initiated, new information will not be gained to aid our knowledge and understanding of prehistoric use of the park area.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 B

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-006.000

TITLE: ROCK ART STUDY

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 4.0

SERVICEWIDE ISSUES: C02 INADEQUATE INV

CULTURAL RESOURCE TYPE CODE: SITE

10-238 PACKAGE NUMBER: 152

PROBLEM STATEMENT:

Rock art in the park is characterized by pictographs generally located in rock shelters or under slight overhangs. Approximately four percent of the sites recorded in the park during the three-phase archeological survey included pictographs. Prehistoric rock art in the park seems to represent two distinctive stylistic traditions. The majority of the sites are representative of the Jornada Style, which is associated with the Southwestern tradition. Motifs include animals, human forms, and decorative patterns. These sites are commonly associated with midden deposits. Several sites on the east side of the escarpement, notabley those in Smith and Pine Springs Canyons, are not consistent with the Jornada Style and have no archeological deposits associated with them. It is hypothesized that these more abstract motifs represent an older tradition, possibly the Archaic Period.

Rock art in the park is deteriorating as a result of natural and human factors. Potential threats to pictograph panels include freeze-thaw cycles, fire, acid rain, unintentional damage by visitors, and intentional vandalism. A complete inventory need to be conducted and all sites thoroughly documented. A research program is needed to analyze known rock art sites in the park and to determine specific perservation needs.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Research should be initiated to determine appropriate preservation techniques for the park's rock art resources. Following this study, preservation treatments presecribed by research should be applied.

2. A complete inventory needs to be completed and all sites should be documented with photographs and a video camera to determine current conditions and threats, and to allow post-treatment monitoring.

3. Analyze Condition of Rock Art: An evaluation of specific preservation needs of pictograph sites would provide the

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necessary baseline information for initiating a program to protect these resources. Appropriate preservation treatment would allow these prehistoric resources to be maintained for future benefit and enjoyment.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	REGN-CR	RES	2.0	0.1
Year 3:	REGN-CR	RES	2.0	0.1
Year 4:				
		Total:	4.0	0.2

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is taken, the park's rock art resources will continue to deteriorate due to weathering and vandalism. Some sites may eventually be lost.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 B

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-007.000

TITLE: HISTORIC STRUCTURES (LCS)

FUNDING STATUS: FUNDED: 8.0 UNFUNDED: 55.0

SERVICEWIDE ISSUES: C01 INADEQUATE DOC

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER: 168

PROBLEM STATEMENT:

The park-wide Survey of Historic Structures (Griggs, 1973), prepared through Texas Tech University, and was the first step in indentifying all of the Historic Structures in the park. Later, addtional structures were added to this survey.
Currently, there are 29 structures listed on the park's List of Classified Structures. Some of these structures have been monimated to the national register, while others are pending nomination or further management determination Each structure, of significance, has been identified in a separate project statement in this document wher management needs are addressed.

Any additional structures, of a historic or prhistoric nature, need to be identified and added to the List of Classified Structures, as appropriate. Other structures, such as wells, tanks, etc. need to be evaluated for inclusion on the list.

This List of Classified Structures needs to be kept current to insure that management actions take these resources into consideration before making any management actions. In addition, it serves as a status report for these sturctures and for tracking National Register status as well.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue to update and keep the List of Classified Structures current to insure that management actions take all of these structures into consideration when decisions are made.
2. Continue to utilize the LCS resource list where National Register Properties are identified within the park to track these nominations.

BUDGET AND FTEs:

	FUNDED			
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-CR	ADM	2.0	0.1
Year 2:	PARK-CR	ADM	2.0	0.1

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Year 3:	PARK-CR	ADM	2.0	0.1
Year 4:	PARK-CR	ADM	2.0	0.1
		Total:	8.0	0.4

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	PARK-CR	MIT	5.0	0.1
	RG-NR-OTH	RES	20.0	0.5
		Subtotal:	25.0	0.6
Year 3:	PARK-CR	MIT	5.0	0.1
	RG-NR-OTH	RES	20.0	0.5
		Subtotal:	25.0	0.6
Year 4:	PARK-CR	MIT	5.0	0.1
	?		0.0	0.0
		Subtotal:	5.0	0.1
		Total:	55.0	1.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If Historic Structure Reports are not prepared for these buildings, if will not be possible to determine preservation needs, appropriate treatment and use, and necessary maintenance of these significant historic resources. Effective interpretation of these sites will be limited by the lack of detailed information.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 B(4)

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-008.000

TITLE: HISTORIC STRUCTURE ROUTINE MAINTENANCE

FUNDING STATUS: FUNDED: 196.0 UNFUNDED: 0.0

SERVICEWIDE ISSUES: C12 PRESERVE MGMT

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER: 181

PROBLEM STATEMENT:

The park currently has 28 historic buildings on the List of Classified Structures. In addition, there are some additional buildings that still need to be added to the LCS. Mnay of these buildings are being used for some type of adaptive use, whiel several are not currently being utilized and are sitting vacant. All of the buildings require some type of routine maintenance for their upkeep and use. Routine maintenance such as cleaning conducting repairs, and general maintenance to provide for upkeep and safety are essential components of the park maintenance program.
Protection andpreservation of historic sites is mandated by various Federal laws, orders, regulations, and NPS guidelines. Historic Structure Preservation Guides exist for most of the historic structures and updates have been requested, as necessary, on an individual basis (See project statements by buildings, i.e. GUMO-C-016, GUMO-C-019).

Maintenance of these structures is documented and tracked in the new maintenance Management System (MMS) which went on line in 1987. This system will help track maintenance work needs for all of the historic structures and document accomplishments.
Management of Pine Springs Cafe poses management concerns because the building is owned by the federal government and the cafe is not operated under a concession contract. The Texas State Historic Preservation Officer has determined that the store is eligible for listing on the National Register of Historic Places; but, because the National Park Service has not been able to assume full control of the property, enforcement of laws, regulations, and policies governing historic preservation (and migitation) have been left to the state of Texas. The State Historic Preservation Officer has agreed to review and approve all repairs or preservation work on the cafe.

Protection of historic sites is mandated by various Federal laws, orders, regulations, and NPS guidelines. Protection measures currently employed in the park include routine ranger patrols, public education, and controlled access to significant historic structures.

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DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue to provide routine maintenance of historic structures to provide for their upkeep and to maintain safe buildings for the public and staff.

2. Continue to maintain records and document maintenance that has occurred and maintenance needs, using MMS, to insure that work is properly documented.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-CR	MIT	45.0	1.0
	PARK-CR	MON	4.0	0.2
		Subtotal:	49.0	1.2
Year 2:	PARK-CR	MIT	45.0	1.0
	PARK-CR	MON	4.0	0.2
		Subtotal:	49.0	1.2
Year 3:	PARK-CR	MIT	45.0	1.0
	PARK-CR	MON	4.0	0.2
		Subtotal:	49.0	1.2
Year 4:	PARK-CR	MIT	45.0	1.0
	PARK-CR	MON	4.0	0.2
		Subtotal:	49.0	1.2
		Total:	196.0	4.8

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	?		0.0	0.0
Year 3:	?		0.0	0.0
Year 4:	?		0.0	0.0
		Total:	0.0	0.0

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

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1. No Action: If no action is initiated, preservation and routine maintenance of these buildings will not occur. The result would be irrepairable damage to the structures and possible safety hazards.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 B(4)

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-009.000

TITLE: HISTORIC RESOURCE STUDY

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 15.0

SERVICEWIDE ISSUES: C01 INADEQUATE DOC

CULTURAL RESOURCE TYPE CODE: ETHN

10-238 PACKAGE NUMBER: 196

PROBLEM STATEMENT:

There are several historic themes and events that have occurred at Guadalupe Mountains National Park. Historic themes include ranching and early settlement of the area, mining and ealry oil exploration, transportation through the area on transportation routes such as the Butterfield Overland Stage Route and early air routes, early geological research, military occupation of th area, etc.
Historic buildings associated with these themes are scattered throughout the park and historic transportation route cross the park. Events in and around the area such as military skirmishes, and the Salt War that occurred at the salt flats all relate to these themes.
A historic resource study is needed in the park to identify and evaluate historic events that occurred in and around the area and identify primary and secondary historic themes for the park. Any addtiion historic sites and scenes, not already identified, also need to be identified. This information is needed in order for management to have adequate information to evaluate and manage the park's historic resources. This study is one required by NPS-28 to meet the needs of cultural resource documentation.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Complete a Historic Resource Study for the park to identify and evaluate the historic events that occurred in and around the park and locate and identify any historic sites and scenes, structures or objects associated waith them, including their historic function to provide informtion important to planning, interpretation and resource management of the park's cultural resources. This study would include nominating and documenting any National Register properties not already documented and a historic resources base map.

2. Complete ethnographic oral histories and life histories as part of the General History of the park to document life in the Guadalupes. This should include oral interviews about subsistence patterns, family, religion, and political life.

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BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
	Total:		0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	?		0.0	0.0
Year 3:	REGN-CR	RES	15.0	0.2
Year 4:				
	Total:		15.0	0.2

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is initiated, there will be no single publication providing a thorough and definitive history of the area from the early historic period (1500's) to the present. Resource management, interpretive programs, and visitor enjoyment of the historical aspects of the park will be hampered by the lack of such a reference. Much information about the past will be lost as people who work in the park or are knowledgeable about the area's history die or move away, and as files and records are disposed of or misplaced.

2. Prepare Area History: Prepare an exhaustive study of all materials relating to the general history of the area, followed by the compilation of a written report, providing a detailed up-to-date source of information. An accessible synthesis of historical information would be useful in management decision-making and interpretive programs, and would contribute to greater understanding of the park's historical resources.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 B

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-010.000

TITLE: ETHNOHISTORY OF THE MESCALERO APACHES

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 50.0

SERVICEWIDE ISSUES: C10 SPECIAL STUDY

CULTURAL RESOURCE TYPE CODE: ETHN

10-238 PACKAGE NUMBER: 169

PROBLEM STATEMENT:

Mescalero Apaches occupied the Guadalupe Mountains both in prehistoric and historic times. Part of their final struggle against United States westward expansion took place within the park area. Prehistoric Apache use of the area has been addressed in several archeological studies (Shafer, 1970; Katz and Katz, 1974; Katz, 1978; and Bradford, 1980), but only a brief, general account of their use of the area in the historic period is available (Biggers, 1979). The nature and extent of the Mescalero Apaches' use of the Guadalupe Mountains for economic, religious, and military purposes is largely unknown. Although their most extensive utilization of the area occurred in the nineteenth century, it is known that the Mescalero used the Guadalupes for religious purposes until very recently. Requests to collect sotol fruit for religious ceremonies have been received from tribal members living on the Mescalero Apache Reservation north of the park.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

A study would be undertaken to determine the extent and nature of the Mescalero Apaches' use of the Guadalupe Mountains for economic, religious, and military purposes during historic times. This historic activity should be correlated with available archeological data and interpretation of prehistoric utilization of the area. The conflicts that took place between the Mescaleros and the U.S. Army should be described. The research effort should encompass traditional documentary sources, military microfilm record, state archives, and oral histories with the Mescalero tribe. The study should be contracted or assigned to an ethnohistorian or a person skilled in researching Indian history.

BUDGET AND FTEs:

FUNDED			
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				

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Year 2:

Year 3:

Year 4:

	Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	RG-NR-OTH	RES	25.0	0.1
Year 3:	RG-NR-OTH	RES	25.0	0.1
Year 4:				
	Total:		50.0	0.2

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is initiated, the extent and nature of Mescalero Apache activities in the area will not be fully known or understood. The lack of an accurate account of this aspect of the park's history may hinder the ability to make informed management decisions and to provide effective interpretive programs.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 B

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-011.000

TITLE: SURVEY OF HISTORIC ROADS AND ENCAMPMENTS

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 15.0

SERVICEWIDE ISSUES: C10 SPECIAL STUDY

CULTURAL RESOURCE TYPE CODE: COMB

10-238 PACKAGE NUMBER: 171

PROBLEM STATEMENT:

William Griggs' 1973 Survey of Historic Structures, Guadalupe Mountains National Park, prepared through Texas Tech University, did not include the several encampment sites and historic roads that existed within the park. These sites represent the significance of the Guadalupe Mountains in the history of exploration, transportation, and military reconnaissance in the Trans-Pecos region. Military encampments, dating from the second half of the nineteenth century, were utilized when the U.S. Army made repeated forays into the area. U.S. expeditions seeking routes for westward expansion were an important part of the history of the area. The historic road that was used by government survey parties, emigrants, Forty-niners, military expeditions, the Butterfield Overland Mail, and others throughout the nineteenth century has not been completely located and mapped. Identified portions of this road on the park's west side have been nominated for inclusion into the National Register of Historic Places.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

A study should be undertaken to locate, identify, and map the sites of military encampments and historic roads, including the Emigrant Trail/Butterfield Stage Route. The site survey report prepared in conjuction with this study should include detailed, well-documented histories of each encampment site located, as well as a history of the use of the overland road.

BUDGET AND FTEs:

	FUNDED		
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				

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		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:	REGN-CR	RES	15.0	0.5
		Total:	15.0	0.5

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If a survey of history roads and encampments is not undertakend, there will continue to be a critical lack of information concerning these significant resources. Such information is needed to protect and interpret these sites, and to convey an accurate picture of the period of westward expansion to the public. The location of the entire extent of the historic Emigrant Trail/Butterfield Stage Route, as it passed through the present park area, will not be identified or protected from human disturbance.

2. Conduct Survey: The sites of nineteenth century military encampments and major overland routes will be located, identified, and mapped. This information is needed to adequately protect and interpret these historic resources. This action would also identify the entire extent of the overland Emigrant Trail/Butterfield Stage Route within the park.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 B

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-012.000

TITLE: HISTORY OF RANCHING

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 25.0

SERVICEWIDE ISSUES: C10 SPECIAL STUDY

CULTURAL RESOURCE TYPE CODE: ETHN

10-238 PACKAGE NUMBER: 170

PROBLEM STATEMENT:

Ranching was a significant part of the area's history from 1876, when the Rader Brothers built the first permanent ranch house near Frijole Spring, until 1972, when the park was established. The ranching industry has been briefly discussed by Levy (1971) and has been treated from a structural standpoint by Griggs (1973). In addition, some information has been collected through interviews and correspondence with early ranchers. A thorough narrative history is needed to document turn of the century homesteading activity, the surge of sheep and goat ranching in the 1920's and 30's, consolidation of small ranches into one large-scale operation by Judge J.C. Hunter, the development of the high country watering system and line camps, etc.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. A thorough narrative of the history of ranching in the Guadalupe Mountains should be prepared. The study should trace the industry from its beginnings in the 1870's with small operators, to the establishment of large-scale ranches in the 1920's and 30's, to the acquisition of ranch lands by the NPS in the 1960's. The study should include oral histories of individuals who were involved in early ranching operations in the area. The compilation of this information would provide for better understanding and more effective interpretation of this period of the park's history. It would benefit efforts to restore natural vegetation conditions and to manage historic remnants of ranching activities.

BUDGET AND FTEs:

FUNDED			
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				

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Year 4:

		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	?		0.0	0.0
Year 3:				
Year 4:	REGN-CR	RES	25.0	0.4
		Total:	25.0	0.4

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is initiated, the ranching history of the area will not be fully documented. Without this information, effective interpretation of this period of history will be limited, efforts to restore park vegetation to natural contitions may be thwarted, and the management and protection of historic remnants of ranching operations may be misguided.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 B

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-013.000

TITLE: HISTORY OF MINING

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 25.0

SERVICEWIDE ISSUES: C10 SPECIAL STUDY

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER: 172

PROBLEM STATEMENT:

Early in the twentieth century, copper and lead mines were developed in the Dog Canyon area of the park. Copper was hauled from the mountain over a wagon road to a smelter in El Paso. Remnants of this road, an old miner's cabin, and ten mine shafts, including one with a short section of rail and an ore cart, are evident near Lost Peak.
Because many of these man-made shafts are unstable, they pose potential safety hazards to visitors. Some of the shaft openings were gated in 1981 for visitor safety, but some still need gates. The Texas Railroad Commission, (Mining Division) is conducting the first state-wide inventory of mines in Texas starting in 1991. There is a possibility that they might be able to provide funds for several gate modifications and one new gate.

Mining was never a major endeavor in the area due to the remote location and distance from El Paso. However, this unique aspect of the area's history and development has not been addressed in any existing report.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. A thorough study should be prepared on the copper mining operation in Dog Canyon as well as any other mining activities in the present park area. The research for this study should include on-site investigations and photographic documentation of mine shafts, interviews with local people who remember the mining period, a search of legal documents and records of companies involved in this mining and other documentation. This would provide greater knowledge and understanding of this aspect of the park's history, and would benefit interpretation and management of historic mine sites and structures.

BUDGET AND FTEs:

FUNDED			
Source	Act Type	Budget ($1000s)	FTEs
Year 1:			

PROJECT STATEMENT SHEET

Year 2:

Year 3:

Year 4:

		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:	REGN-CR	RES	25.0	0.5
		Total:	25.0	0.5

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is initiated, little will be known about the duration and extent of mining activitiy in the area, quantities and value of ore removed, and the overall significance of historic sites and structures related to this activity. Lack of detailed information will hamper effective interpretation and management of these historic resources.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM6 App. 7.4 B

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-014.000

TITLE: CULTURAL RESOURCE DATABASE

FUNDING STATUS: FUNDED: 16.0 UNFUNDED: 22.0

SERVICEWIDE ISSUES: C02 INADEQUATE INV

CULTURAL RESOURCE TYPE CODE: COMB

10-238 PACKAGE NUMBER: 137

PROBLEM STATEMENT:

Management of the park's cultural resources requires a good information base upon awhich to make management decisions. Good sursveys and research provided information for planning and interpretation and are critical needs for making managemenat decisions and evaluating effects of these decisions.

A considerable volume of information is available to the park on the cultural resources. Copies of research and all knowan park related publications are on file in the park's library. The volujme and scope of information available in these publications is immense. In addition, to publications, the park's information bse includes: historic base maps, archeological site records, varaious reports, field notes and maps, photographs, slides, etc.

A historic base map was completed in 1988. Several archeological base maps exist from different surveys. This data is found in various formats and locations. The need to organize this database and develop an effective retrieval process is critical if this information is to be effectively utilized.

The Cultural Resources Management Bibliography (CRBIB) is one component of this database in that it is an inventory of reports that address the park's cultural resources. This database needs to be kept current and made use of.

Management of the park's cultural resources at the park-level requires a comprehensive and accessible computerized database, to make the information easily retrievable and useable. The need exists for this database to also be accessible to the park's GIS system so that this information will be interdisciplinary in nature.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue to update the CRBIB and have all available rports, literature and other information on the park's cultural resources available to facilitate research, planning, interpretation, etc.
2. Develop a cultural resources information database that would

integrate all information on the cultural resources of the park for use by management. This would include a compilation of all literature, field notes, site records, reports, maps, etc. providing information on the park's cultural resources. The output of such a compilation should be a complete inventory file of archeological, ethnographic and historic sites and a comprehensive cultural resources base map. Cultural resourcsess overlays should be developed as part of the park's resource inventory map series. This action would be correlated with GUMO-N-021 Natural Resources Information Database and become part of the park's Geographic Information System. This resource database would include the Cultural Sites Inventory (GUMO-C-032) and the List of Classified Structures (GUMO-C-033).

3. Site files would be established for each site in the park as a point of gathering all information on each cultural site in one location for retrieval for research and management action.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-CR	ADM	2.0	0.1
	VOL-IN-PK	ADM	2.0	0.3
		Subtotal:	4.0	0.4
Year 2:	PARK-CR	ADM	2.0	0.1
	VOL-IN-PK	ADM	2.0	0.3
		Subtotal:	4.0	0.4
Year 3:	PARK-CR	ADM	2.0	0.1
	VOL-IN-PK	ADM	2.0	0.3
		Subtotal:	4.0	0.4
Year 4:	PARK-CR	ADM	2.0	0.1
	VOL-IN-PK	ADM	2.0	0.3
		Subtotal:	4.0	0.4
		Total:	16.0	1.6

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	REGN-CR	ADM	5.0	0.1
	PARK-CR	ADM	4.0	0.1

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		Subtotal:	9.0	0.2
Year 3:	REGN-CR	ADM	3.0	0.1
	PARK-CR	ADM	4.0	0.1
		Subtotal:	7.0	0.2
Year 4:	REGN-CR	ADM	2.0	0.1
	PARK-CR	ADM	4.0	0.1
		Subtotal:	6.0	0.2
		Total:	22.0	0.6

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: Without action, available information concerning the park's archeological and historic resources will not be available in a comprehensive, up-to-date format. Inaccessible or missing data may lead to lack of consideration of cultural resources in management decision making and to human disturbance of cultural sites.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 App. 2, 1.6

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-015.000

TITLE: ADMINISTRATIVE HISTORY

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 0.0

SERVICEWIDE ISSUES: C08 NEED ADMN HIST

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Guadalupe Mountains National Park, a relative new park does not have an administrative history. Various news clippings, magazine articles, interviews, legislative reports, planning documents, hearing records, and park files exist that need to be compiled into one single document. The administrative history of the park should be written to enable future park personnel the opportunity to make sound management decisions based on agreeements made prior to their arrival. It will help them to better understand their surroundings and the local ranchers with whom they might have to deal with.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Prepare a comprehensive administrative history of the park to aid park management, interpretation, or to fill the voids in historical material on the park. At the present time, a contractor is working on finalizing an administrative history of the park. The final report is due in March, 1988, regional and park staff will review and approve the final report.

BUDGET AND FTEs:

FUNDED			
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
Total:			0.0	0.0

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----------UNFUNDED----------

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.1
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.1

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. If no action is taken, no definitive administrative history of the park will be available to future park staff and administrators. When information is requested, personnel will have to try to obtain it by looking up files, calling or writing to past park employees to find answers.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 App. 2, 1.6

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-016.000

TITLE: FRIJOLE RANCH HOUSE

FUNDING STATUS: FUNDED: 31.0 UNFUNDED: 15.0

SERVICEWIDE ISSUES: C05 NEED HSRS C12 PRESERVE MGMT

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Frijole Ranch House is on the List of Classified Structures (LCS #05700) and is eligible for the National Register. The ranch house was built in 1859 by the Rader Brothers who came into the area and started ranching operations.

The ranch house was originally a two room, two story stone structure. Later, three rooms were added to the house on the north side.

The ranch house will become the focal point for interpretation of the ranching period in the park by FY 92. The first floor of the house will become a walk thru exhibit to interpret the cultural story of the park. The ranch house will undergo structural changes for exhibit room display installations and accessibility.

The most recent work on the Frijole Ranch House was in 1983, when the building was brought to present standards using regional cyclic maintenance funds and the regional rehab crew. Currently, the exterior of the Frijole Ranch House needs rehab work, because of rodent holes, cracked mortar and paint peeling.

A mini-Historic Structure Report has been completed for the house and maintenance is being done under an approved interim Historic Structure Preservation Guide.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Rehab the exterior of Frijole Ranch House during FY 91 and continue to provide maintenace for the upkeep of the building.

2. Make structural changes to house exhibits and make accessiblity availiable to everyone.

3. Continue to provide for the daily maintenance and upkeep of the building as provided for in the approved interim Historic Structure Preservation Guide.

4. Continue to monitor, document assess structure condition

annually/biannually.

Research:

1. Prepare a comprehensive Historic Structures Report for Frijole Ranch House and obtain a final National Register determination on this structure.

2. Update the Historic Structures Preservation Guide for Frijole Ranch House after completion of restoration and rehab work.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-CR	MIT	30.0	0.5
	?		0.0	0.0
	VOL-IN-PK	MIT	1.0	0.3
		Subtotal:	31.0	0.8
Year 2:				
Year 3:				
Year 4:				
		Total:	31.0	0.8

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
	?		0.0	0.0
		Subtotal:	0.0	0.0
Year 2:	PARK-CR	MIT	5.0	0.1
Year 3:	PARK-CR	MIT	5.0	0.1
Year 4:	PARK-CR	MIT	5.0	0.1
		Total:	15.0	0.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): NHPA

EXPLANATION: National Historic Protection Act

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-017.000

TITLE: FRIJOLE OUTBUILDINGS

FUNDING STATUS: FUNDED: 25.0 UNFUNDED: 5.0

SERVICEWIDE ISSUES: C05 NEED HSRS C12 PRESERVE MGMT

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The Frijole Ranch House has several buildings associated with the ranching period. Included in the Frijole Outbuildings are the; Barn (LCS #05700), Schoolhouse (LCS #12087), Spring House (LCS #12086), Pump House (LCS # 12085), Toilet & Shower (LCS $12084), and Bunk House (LCS # 12083). All these buildings are associated with the ranching period.

The schoolhouse and barn/corral are constructed of wood, while the others are constructed of stone. These buildings in conjunction with the Frijole Ranch house itself are an interpretive focal point to interpret the ranching story. This site will become by 1992, the location for the park's cultural exhibits. Additional information
is needed to interpret these structures and to provide management direction on their maintenance, restoration, rehabilitation and use. Preventive and preservation maintenance is required to preserve these structures.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Prepare a Historic Structures Report for each building associated with the Frijole Outbuildings complex.

2. Update the Historic Structural Perservation Guide (HSPG) for the Frijole Outbuildings complex, as additional information is obtained.

3. Continue to do preservation maintenance in accordance with the HSPG.

4. Continue to monitor, document and assess structure condition annually/biannually.

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BUDGET AND FTEs:

	Source	Act Type	Budget ($1000s)	FTEs
FUNDED				
Year 1:	PARK-CR	MIT	4.0	0.1
	REGN-CR	MIT	15.0	0.0
		Subtotal:	19.0	0.1
Year 2:	PARK-CR	MIT	2.0	0.1
Year 3:	PARK-CR	MIT	2.0	0.1
Year 4:	PARK-CR	MIT	2.0	0.1
		Total:	25.0	0.4
UNFUNDED				
Year 1:	?		0.0	0.0
	?		0.0	0.0
		Subtotal:	0.0	0.0
Year 2:	REGN-CR	MIT	5.0	0.1
	?		0.0	0.0
		Subtotal:	5.0	0.1
Year 3:	?		0.0	0.0
Year 4:	?		0.0	0.0
		Total:	5.0	0.1

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): NHPA

EXPLANATION: Section 106 Compliance

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-018.000

TITLE: FRIJOLE LANDSCAPE

FUNDING STATUS: FUNDED: 25.0 UNFUNDED: 10.0

SERVICEWIDE ISSUES: C11 CULT LAND REPT

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The Frijole Ranch House was built in 1859 by the Radar Brothers adjacent to the Frijole Spring. It was in this area that they began ranching operations and built their ranch headquarters. In addition to the Ranch House proper, several adjoining outbuildings were built to support the ranching operation. These buildings include the following: barn and corral, schoolhouse, spring house and pumphouse, toilet and shower, and a bunk house. The area surrounding these buildings formed the ranch headquarters and was delineated with stone walls, fences and related implements. Associated objects still remain in the area including stock tanks, watering troughs, the wooden water tank stand, etc.

Within the confines of these buildings and related objects, pecan trees, fruit trees and other vegetation was planted to support the ranching operation and life. An irrigation system was built to water the garden, fruit and pecan trees. Other similar types of activites related to ranch life were conducted in the area. As far as the Manzanita Spring (approximately 1/4 mile) a structure was built to trap water and create the pond that still exists today.

This historic district sits in a natural management zone of the park. The boundaries of this historic district need to be delineated to identify what is to be maintained as the historic scene. In addition, research needs to be conducted on the character of that historic scene to be maintained and preserved. Without this direction, there will continue to be problems and conflicts relating to what maintenancae of the grounds should be undertaken, what should be preserved and what elements should be allowed to revert back to a natural setting.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Prepare a cultural landscape plan for the Frijole Ranch House to delineate the boundaries of the cultural district and to provide direction and guidance to the maintenance of the historic scene.

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2. Continue to maintain the grounds in the immediate vicinity of the house as a residence until a cultural landscape plan can be completed.

3. Implement the cultural landscape plan maintaining a component of the historic scene to compliment the interpretive efforts associated with the restored ranch house and the cultural exhibits on ranching found at the ranch house.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PKBASE-OT	MIT	25.0	0.5
	VOL-IN-PK	RES	0.0	0.3
		Subtotal:	25.0	0.8
Year 2:				
Year 3:				
Year 4:				
		Total:	25.0	0.8

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	REGN-CR	RES	10.0	0.1
Year 3:				
Year 4:				
		Total:	10.0	0.1

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): NHPA

EXPLANATION: Section 106 Compliance

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-019.000

TITLE: PRATT CABIN

FUNDING STATUS: FUNDED: 3.0 UNFUNDED: 14.0

SERVICEWIDE ISSUES: C05 NEED HSRS C12 PRESERVE MGMT

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The Pratt Cabin (LSC #12077) is a "Stone Cabin" located on a terrace of the flood plain of North McKittrick Canyon at its junction with South McKittrick Canyon. It was built by Wallace Pratt during the winter of 1931-1932 and served as his Guadalupe residence for many years.

The cabin is built entirely of native stone, including the floor and roof as well as the walls. The only other building material other than the stone is the heavy, heart-of-pine rafters (6"x 8") with their collar beams and rough sheeting which support the roof. The building consists of a living room, kitchen, two bedrooms and a full-length south facing porch.

The building is on the park's List of Classified Structures and is considered eligible for the National Register. The cabin is of importance to the park in that it was the residence of Wallace Pratt, whose donation of McKittrick Cnyon became the focal point for the creation of Guadalupe Mountains National Park.

The cabin is a popular visiting spot for the many visitors who hike into McKittrick Canyon. The cabin still has many of the original furnishings and when a ranger is present, visitors can see the living room of the cabin. The cabin was previously used as a ranger residence and is still used as an overnight facility for rangers working in and patrolling the canyon.

Currently, a Historic Structures Report does not exist for this building. A interim Historic Preservation Guide has been prepared to cover on-going maintenance needs. Maintenance of the structure includes trimming vegetation and repointing walls. The roof was removed and deteroriating beams replaced in the mid-1980's. False carpenter ants have been a problem in these beams and the beams are treated annually by the park's IPM Coordinator for this problem.

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-022.000

TITLE: SHIP-ON-THE DESERT

FUNDING STATUS: FUNDED: 83.0 UNFUNDED: 6.0

SERVICEWIDE ISSUES: C05 NEED HSRS C12 PRESERVE MGMT

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Wallace Pratt built his second home, Ship-On-The Desert (LCS# 12080) outside McKittrick Canyon proper starting in 1941. The beginning of World War II halted construction until 1945 when full scale construction started again. An architect by the name of Newton Bevin from New York city was hired by Mr. Pratt to build his second home. As an oil geologist, Mr. Pratt wanted this structure to resemble an oil tanker, hence the name; Ship-On-The Desert. It has received some architectural awards due to its unusual design.

The building ground floor plan is a narrow rectangle, 16 x 110 feet, single story with a flat deck roof. (The flat deck roof was replaced in 1984 and continues to have problems due to leaks) On both sides, the deck extends out to cover a paved, semi-enclosed gallery. This gallery is eight feet in width, running the full length of the structure. The long axis is oriented south-southwest into the prevailing wind. Inside the dining room, the captain's bridge arises from the main deck into a small, glassed-in second story room. Detached from the main building was a two-car garage with a small spare bedroom that was sometimes used as a guest bedroom.

The principal construction material was the natural building blocks (McCombs and Radar limestone) collected from the surrounding countryside. The building was completed in 1945 and Mr. Pratt lived there until ill health required him to move to Tucson, Arizona in the late 1970's.

In 1978, Ship-On-The Desert was nominated to the National Register of Historic Places. The nomination was returned to the park for additional documentation on its architectural significance, because it did not meet age requirements and because it was named for a living person (Wallace Pratt Residence-"Ship-On-The Desert").

Currently, preservation maintenance is completed in accordance with an existing Historic Structures Preservation Guide. Beginning in 1988 it was decided to use this facility as a

research facility. As a result, it is now used as a bunk-house work site by researchers conducting research activities in the park. This need existed because of the remote location of Guadalupe Mountains National Park and the need to accommodate researchers. Actual management of the building is conducted in accordance with the park's Housing Management Plan and a specific Standard Operating Procedure (SOP) for operation of the Ship-On-The Desert Research Facility.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Prepare a Historic Structures Report for Ship-On-The Desert to fully document this building and make a final National Register determination.

2. Update the Historic Structures Preservation Guide for Ship-On-The Desert as new information becomes available.

3. Repair/replace the flat roof in accordance with regional and park guidelines. Consultation with regional cultural personnel will take place and a XXX form will be completed and approved by region before any repairs area initiated.

4. Restore/rehab the building to be used as a Research Facility for visiting researchers. Continue to do maintenance in accordance with the approved Historic Structures Preservation Guide.

5. Continue to monitor, document and assess the structure condition annually/biannually.

BUDGET AND FTEs:

			FUNDED	
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	$-DONATE	MIT	18.0	0.0
	PARK-CR	MIT	5.0	0.2
	REGN-CR	MIT	60.0	0.0
		Subtotal:	83.0	0.2
Year 2:				
Year 3:				
Year 4:				
		Total:	83.0	0.2

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	Source	Act Type	Budget ($1000s)	FTEs
		UNFUNDED		
Year 1:	?		0.0	0.0
Year 2:	PARK-CR	MIT	2.0	0.1
Year 3:	PARK-CR	MIT	2.0	0.1
Year 4:	PARK-CR	MIT	2.0	0.1
		Total:	6.0	0.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): NHPA

EXPLANATION: Section 106 Compliance

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-023.000

TITLE: SHIP-ON-THE DESERT CULTURAL LANDSCAPE

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 17.0

SERVICEWIDE ISSUES: C11 CULT LAND REPT

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The Ship-On-The Desert sits near the base of the escarpment just south of McKittrick Canyon. Surrounding the structure and associated buildings is a high fence and gates, originally built by Mr. Pratt, the builder of the house, to keep out deer and elk.

The grounds of the residence were planted with ornamental and fruit trees. The grounds sit in an otherwise natural zone along the east escarpment of the park. As a determination is made the National Register eligibililty of the house, a related determination then needs to be made regarding the grounds and fence. This would give management the information needed on what, if any of this associated landscape needs to be maintained as a cultural landscape.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Prepare a cultural landscape plan for Ship-On-The Desert to determine the boundary of this complex and provide direction for its maintenance.

2. Continue to maintain grounds adjacent to the house as residences until a cultural landscape plan can be completed to provide additional guidance.

BUDGET AND FTEs:

FUNDED			
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
Total:			0.0	0.0

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	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	REGN-CR	RES	10.0	0.1
Year 3:	PARK-CR	MIT	5.0	0.2
Year 4:	PARK-CR	MIT	2.0	0.1
		Total:	17.0	0.4

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): NHPA

EXPLANATION: Section 106 Compliance

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-024.000

TITLE: THE PINERY

FUNDING STATUS: FUNDED: 8.0 UNFUNDED: 5.0

SERVICEWIDE ISSUES: C05 NEED HSRS C12 PRESERVE MGMT

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The Butterfield Overland Stage Station otherwise known as the Pinery (LCS # 00520) is on the National Register of Historic Places. The Pinery first started receiving travelers, mail, coaches and horses on September 28, 1858. The Pinery located at 5,534 feet in elevation at Guadalupe Pass, was the highest station along the route. The Pinery was operational for approximately 18 months and then closed because another southern route between Fort Davis and El Paso was established.

Originally, the Pinery consisted of three mud-roofed rooms connected to a fortress like rectangular enclosures, a stone-walled corral and a heavy pine post stockade. The walls, built of limestone slabs and adobe, were 30" thick and 11 feet high. Today, all that remains is an outline of the foundation and remains of some of the walls. These walls require maintenance and stabilization to insure their perservation.

In addition, the boundaries of the Pinery area need to be determined and a cultural landscape plan prepared so that the historic scene can be managed. The Pinery is located in a natural management zone of the park. This information would provide management with the needed information to maintain these grounds.

A updated Historic Structures Report is needed for the Pinery, along with a compehensive Historic Structural Preservation Guide. A Cultural Landscape Plan is needed to determine the boundaries of the Pinery.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Update the Historic Structures Report written in 1973 by Griggs.

2. Update the Historic Structural Preservation Guide for the Pinery, as more information is obtained.

3. Prepare a Cultural Landscape Plan for the Pinery to determine

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the boundaries of the Pinery and guide management and maintain the historic scene.

4. Continue to stabilize the ruin in accordance with the Historic Structural Preservation Guide and continue to trim vegetation from the ruin to prevent adverse impacts.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-CR	MIT	2.0	0.1
Year 2:	PARK-CR	MIT	2.0	0.1
Year 3:	PARK-CR	MIT	2.0	0.1
Year 4:	PARK-CR	MIT	2.0	0.1
		Total:	8.0	0.4

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
	?		0.0	0.0
		Subtotal:	0.0	0.0
Year 2:	?		0.0	0.0
Year 3:	?		0.0	0.0
Year 4:	PARK-CR	MIT	5.0	0.2
		Total:	5.0	0.2

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): NHPA

EXPLANATION: Section 106 Compliance

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-025.000

TITLE: PINE SPRINGS CAFE

FUNDING STATUS: FUNDED: 5.0 UNFUNDED: 9.0

SERVICEWIDE ISSUES: C05 NEED HSRS C12 PRESERVE MGMT

CULTURAL RESOURCE TYPE CODE: STRC

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The Pine Springs Store/Cafe is located on U.S. Highway 62/180 near the top of Guadalupe Pass within Guadalupe Mountains National Park. The store/cafe was purchased by the National Park Service in 1972 from Walter and Bertha Glover, along with a 85 acre tract out of the Glover's 3700-acre ranch. The value of the 85-acre tract containing the store/cafe was appraised at $35,000 by an independent third party appraiser in 1970. The U.S. Government paid the Glovers $55,000 for the property in order to accept a settlement offer from the Glover's attorney following filing of condemnation papers. In addition to receiving the $55,000 compensation, the Glover's were also given the right to remain on the 85-acre tract and to operate the store/cafe until the death of the last surviving spouse even though title to the 85-acre tract with the store/cafe had transferred to the U.S. Government. Walter Glover died in 1973 at age 94 and Bertha Glover died in August 1982 at age 89.

Several weeks after Bertha Glover's death, a representative of the National Park Service met with her daughter, only survivor, and inheritor of the remainder of the Glover ranch, Mary Hinson, who resides in El Paso, Texas, to work out a mutually agreeable date for vacating the store/cafe. Mary Hinson initially requested, and was given, a 4-month period, ending December 31, 1982, to vacate the property. At the end of that period, Mrs. Hinson requested and was given an additional 6 months to June 30, 1983. Considerable publicity and controversy were generated about the store/cafe beginning in October, 1982. Because of the continued reluctance by Mrs. Hinson to vacate the property, another 1-year extension until June 30, 1984, was given by letter. This was followed by issuance of a "Use and Occupancy" agreement, allowing continued use of the store/cafe until June 30, 1985; then another 1-year renewal of that agreement through June 30, 1986.

When the National Park Service determined in 1986 that the "Use and Occupancy" agreement would not be renewed, considerable publicity and controversy were again generated. Because of that controversy, a new 5-year "Letter of Authorization" was approved

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by the Secretary of the Interior, allowing use of the store/cafe by Mary Hinson until January 1, 1992. The letter of authorization stipulates that no capital improvements are to be made and that repairs affecting the historical integrity of the cafe are to be made and that repairs affecting the historical integrity of the cafe are to be coordinated with the State Historical Preservation Office since that office determined in 1983 that the store/cafe was eligible for listing on the National Register of Historic Places. Mrs. Hinson, who continues to reside in El Paso, Texas, 110 miles west of the park, has also agreed to meet applicable State health and safety codes and to assume liability for damages to third parties entering the property. Mrs. Hinson pays a nominal rental fee for use of the property and for water, which is furnished by the National Park Service. Since Mrs. Hinson resides in El Paso, Texas, friends of hers living near the park operate the store/cafe.

In 1990, regional office personnel completed an inventory of the store/cafe buildings. A total of 11 buildings making up the complex were inventoried (LCS # 23323-23325 and 23328-23335). Most of these are wood buildings in deteriorating condition. Currently, no final determination has been made on the historical significance at a national level if any, of these buildings. Management is in need of a comprehensive study and assessment to guide future decisions.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Prepare a Historic Structure Report for the Pine Springs store/cafe. This should be done by an independent contractor evaluating the significance of these buildings with recommendations on whether they should be placed on the National Register. This independent recommendation would then help direct management decisions on these buildings.

2. Continue to work cooperatively with the State Historical Preservation Office and the Southwest Regional Office in managing the store/cafe and issues that might come up. Make a final National Register determination on these buildings.

BUDGET AND FTEs:

	FUNDED			
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-CR	MIT	5.0	0.2
Year 2:				
Year 3:				
Year 4:				

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		Total:	5.0	0.2

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	PARK-CR	MON	3.0	0.1
Year 3:	PARK-CR	MON	3.0	0.1
Year 4:	PARK-CR	MON	3.0	0.1
		Total:	9.0	0.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): NHPA

EXPLANATION: Section 106 Compliance

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-026.000

TITLE: BUTTERFIELD OVERLAND STAGE ROUTE

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 22.0

SERVICEWIDE ISSUES: C10 SPECIAL STUDY

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The Butterfield Overland Stage Route approached Pine Springs, Texas, located on the east side of the Guadalupe Mountains, from almost a due easterly direction. The date was September, 1858, and the Butterfield Overland Stage Route station at Pine Springs was operational for 18 months.

Once at Pine Springs, the route went west thru Guadalupe Pass. Once thru the Pass, the road turned to the south and ran down Guadalupe Canyon for a distance of approximately 3.5 miles. This section of road was heavily impacted early in the 20th century by the construction of U.S. Highway 62/180 which closely followed the path of the emigrant road and the Butterfield Stage Route. At the bottom of Guadalupe Canyon, the road turned sharply to the northwest and headed for Crow Springs near the New Mexico boundary.

For approximately seven miles, the Butterfield Stage Route traveled over extremely rugged terrain characterized by rock strewn ravines and by a total lack of trees or water. With the Guadalupe Mountains escarpment to the east and the Patterson Hills forming an effective barrier to the west, the country was traversed until the road descended to the barren salt basin region to the west.

Portions of the Butterfield Stage Route on the west side of the escarpement are presesntly used by park personnel and visitors as the most direct access to the Williams Ranch. An approximately 2.5 mile stretch of that section of the Butterfield Stage Route is closed to vehicular traffic.

Research is being done on the stage route and a national register nomination has been initiated. Complete mapping and documentation is needed to provide management with information needed to properly interpret and protect the remnants of the Butterfield Overland Stage Route.

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DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Compete the study on the Butterfield Stage Route as it passed thru the park. This information wil benefit park management and give it added protection.

2. Map and document the entire route of the Butterfield Stage Route in the park. This map should be available to the visiting public who travel down the Williams Ranch road.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	REGN-CR	RES	10.0	0.1
Year 3:	REGN-CR	RES	10.0	0.1
Year 4:	PARK-CR	MIT	2.0	0.1
		Total:	22.0	0.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 App. 2, 1.6

Proposal Date: 92

PROJECT STATEMENT SHEET

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-CR	ADM	15.0	0.3
	PKBASE-OT	INT	15.0	0.5
		Subtotal:	30.0	0.8
Year 2:	PARK-CR	ADM	15.0	0.3
	PKBASE-OT	INT	15.0	0.5
		Subtotal:	30.0	0.8
Year 3:	PARK-CR	ADM	15.0	0.3
	PKBASE-OT	INT	15.0	0.5
		Subtotal:	30.0	0.8
Year 4:	PARK-CR	ADM	15.0	0.3
	PKBASE-OT	INT	15.0	0.5
		Subtotal:	30.0	0.8
		Total:	120.0	3.2

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	PARK-NR	ADM	5.0	0.1
Year 3:	PARK-NR	ADM	5.0	0.1
Year 4:	PARK-NR	ADM	5.0	0.1
		Total:	15.0	0.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s):

EXPLANATION:

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-029.000

TITLE: ARCHEOLOGICAL OVERVIEW AND ASSESSMENT

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 17.0

SERVICEWIDE ISSUES: C10 SPECIAL STUDY

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

An Archeological Overview and Assessment for Guadalupe Mountains National Park in the High Country was completed by Paul Katz in 1978. This assessment was centered on the high country and was a partial survey. It is estimated that 30-40% of the park has not been surveyed. In the 13 years since this assessment was completed, various other archeological work has been completed. These surveys include: Trail surveys in the 1980's prior to the building of trails leading into the high country, reroute of Williams Ranch Road in 1985, and the recent 1990 survey of North McKittrick Canyon by the Texas Historical Commission and Southwest Regional Office archeologists.

Historic archeological sites in the park have never been examined. There are several sites in the park requiring an assessment. These sites include the Frijole Ranch Site (one corner of the house is built on a midden, Bradford, 1981), McKittrick Dugout and the Williams Ranch House. Early studies by Texas Tech University in the 1970's identified and documented some of these areas, but no assessment was ever written.

A comprehensive archeological assessment is needed by park management to determine the best course of action for the present and future management of these archeological sites. The assessment should also gather information on the location and condition of earlier archeological artifacts collected by various other universities and archeologists. This information is required by law and is necessary so that property and museum loan paperwork can be completed.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Complete a park-wide comprehensive Archeological Overview and Assessment. This assessment should cover the entire park and also focus on historic archeology. The assessment should cover previous archeological surveys and the location and condition of these artifacts.

2. Complete an annotated bibliography to identify archeological

PROJECT STATEMENT SHEET

work completed in the park.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
	Total:		0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	REGN-CR	RES	17.0	0.1
Year 3:				
Year 4:				
	Total:		17.0	0.1

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 App. 2, 1.7

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-030.000

TITLE: ARCHEOLOGICAL SURVEY OF THE WEST SIDE ADDITION

FUNDING STATUS: FUNDED: 20.0 UNFUNDED: 140.0

SERVICEWIDE ISSUES: C02 INADEQUATE INV C10 SPECIAL STUDY

CULTURAL RESOURCE TYPE CODE: SITE

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

In 1988, Congress authorized the addition of 10,000 acres to be added to the park's west side. The addition is known as the west side addition due to the location of this land.

When the park takes over this land, an archeological survey of the area should be conducted. This is required under Section 106 of the National Historic Preservation Act, 1966, as amended in 1980, "Standards and Guidelines for Archeology and Historic Preservation" (FR48:44716-40) and NPS-28. Park Managers will have a better idea of the type of archeological sites found in the area and protection measures needed to protect these valuable archeological sites.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Conduct an archeological survey as required under Section 106 of the National Historic Preservation Act and NPS-28. Data collected during this survey will help park management determine the best management strategies for this sensitive archeological area.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-CR	PRO	5.0	0.1
Year 2:	PARK-CR	PRO	5.0	0.1
Year 3:	PARK-CR	PRO	5.0	0.1
Year 4:	PARK-CR	PRO	5.0	1.0
		Total:	20.0	1.3

Proposal Date: 92

PROJECT STATEMENT SHEET

	Source	Act Type	Budget ($1000s)	FTEs
		UNFUNDED		
Year 1:	?		0.0	0.0
	?		0.0	0.0
		Subtotal:	0.0	0.0
Year 2:	PARK-CR	PRO	10.0	0.2
	CRPP	RES	50.0	1.0
		Subtotal:	60.0	1.2
Year 3:	PARK-CR	PRO	10.0	0.2
	CRPP	RES	50.0	1.0
		Subtotal:	60.0	1.2
Year 4:	PARK-CR	PRO	10.0	0.2
	REGN-CR	RES	10.0	0.1
		Subtotal:	20.0	0.3
		Total:	140.0	2.7

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): NHPA

EXPLANATION: Arch. Survey

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-031.000

TITLE: CULTURAL SITE INVENTORY

FUNDING STATUS: FUNDED: 8.0 UNFUNDED: 20.0

SERVICEWIDE ISSUES:

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Guadalupe Mountains National Park has over 300 known archeological sites in the park. Because of the rugged terrain and remoteness of the park, there is a high potential that numerous additional sites exist.

Extensive archeological investigations occurred in the park in the 1930's and again from the mid-1960's to 1980. A three-phase survey was conducted in the park in 1970, 1973 and 1975. As a result, there are over 300 recorded sites in the park, including burned rock hearths, and scatters, midden rings and mounds, lithic and ceranic scatters, rock shelters, caves and pictographs. Twenty-seven of these sites are currently considered eligible for the National Register of Historic Places. This complex in North McKittrick Canyon was nominated to the National Register in 1990.

The semiarid climate, the physical difficultly of gaining access to the park's high country, and the fact that the area was protected as private property until 11970, have probably contributed to a relatively high incidence of artifactural materials such as: projectile points, stone tools, and pottery sherds being found int he park.

The surveys codnucted in the park in the 1970's is considered to be adequate to meet the requirements of Executive Order 11593. However, it is estimated that 30-40% of the park has still not been surveyed and additional new sites are being routinely located.

There is a need to finish the archeological survey of the park and to complet a Cultural Site Inventory of Archeological and Ethnographic sites in the park. This information is needed to provide management with the information necessary to properly manage these cultural resources.

Proposal Date: 92

PROJECT STATEMENT SHEET

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue to document additional archeological sites as they are discovered and to add them to the Cultural Sites Inventory and Cultural database.

2. Complete the archeological survey of the park.

3. Complete a Cultural Sites Inventory describing and documenting the location, significance, threats, and management requirements for known park ethnographic and archeological resources. This would include maps of these sites was well as information vital to the Cultural Resource Database.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-CR	MON	2.0	0.0
Year 2:	PARK-CR	MON	2.0	0.0
Year 3:	PARK-CR	MON	2.0	0.0
Year 4:	PARK-CR	MON	2.0	0.0
		Total:	8.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	REGN-CR	RES	10.0	0.1
Year 3:	REGN-CR	RES	10.0	0.1
Year 4:				
		Total:	20.0	0.2

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): EXCL ARPA

EXPLANATION: Archeologial Resources

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-C-032.000

TITLE: GENERAL PARK HISTORY

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 15.0

SERVICEWIDE ISSUES: C10 SPECIAL STUDY

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Guadalupe Mountains is a relatively young park (19 years old) and, while a number of reports are available concerning the history of the area, very few professional studies have been completed. The Guadalupe Mountains National Park Historical Resources Study prepared by Benjamin Levy in 1971, provides the most complete synthesis from late prehistory to the end of the ranching era. Levy's report was written primarily as a management document to provide background data for park planners, to identify themes for interpretative programs, and to recommend appropriate treatment and use of historic sites and structures. Although it provides a useful guide to the full range of historical developments in the Guadalupe Mountains, it was not intended as a thorough or definitive history of the area. A historical base map should be part of th final product once a Historical Resource Study is completed. In 1987, the park initated a survey of all the historic structures and other man-made facilities in the park. The park now has a base map with all historic structures located on the map. This study will help facilitate a more complete Historic Resource Study.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Specific history studies needed for park management, interpretation, or to fill voids in historical material currently available, should be identified and researched. These studies should be conducted by professional historians and shoudl result in detailed, well documented written publications. Preparation of a synthesis of the general history of the area should be postponed until thses specific studies are completed in order to eliminate overlapping research efforts, and to permit more concentrated investigation of subjects thata have not been documented previously.

2. Complete Ethnographic oral histories and life histories as part of the General History of the park to document life in the Guadalupes. This should include oral interviews about subsistence patterns, family, religious and political life.

PROJECT STATEMENT SHEET

BUDGET AND FTEs:

----------FUNDED----------

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

----------UNFUNDED----------

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:	REGN-CR	RES	15.0	0.2
Year 3:				
Year 4:				
		Total:	15.0	0.2

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is initiated, there will be no single publication providing a thorough and definitive history of the area from the early historic period (1500's) to the present.

COMPLIANCE CODE(s): NHPA

EXPLANATION: Section 106 Compliance

Proposal Date: 92

Interdisciplinary Resource Management Project Statements

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-I-001.000

TITLE: IMPACTS OF PREVIOUS LAND USE

FUNDING STATUS: FUNDED: 10.0 UNFUNDED: 75.0

SERVICEWIDE ISSUES: C13 REHAB/RESTORAT C22 OUT THREATS CR

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Guadalupe Mountains National Park was established in 1972. Prior to the establishment of the park, the area had a rich history of use, the mountains served as a transportation route for Native Americans, early settlers, the military, stage routes, etc. The mountains were home to ranching for over 100 years. Some farming occurred in conjunction with this ranching. In addition, the area was used as a hunting resort and some mining occurred. All of these uses had long lasting impacts on the land. These and other man-made alterations and remnants of previous land uses remain. Occassionally they have historic importance, but more often are disruptive of natural processes, eyesores, and sometimes create safety hazards to the visiting public.

Surface water resources in the park include permanent and intermittent springs, seeps, and one perennial stream.

These natural aquatic systems were significantly altered prior to the establishment of the park. Major springs were developed for domestic or ranching uses as evidenced by pipelines, earthen and metal tanks, guzzlers, and spring houses. There was also extensive development of artificial watering sources utillizing wells and rainfall to supply tanks for watering livestock.

Windmills, and concrete dams were built for water, cross fences were built to manage livestock and in McKittrick Canyon by Mr. Pratt to keep elk out. Roads were built to old homesites. All of these previous land uses have had impacts on the resource and in many instances are still disruptive to natural processes and sometimes create hazards. Actions need to be taken to minimize their impact on the natural environment and restore natural processes where possible.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Where natural springs have been disturbed, modified, or developed, for needs other than human consumption, the site should be restored to the extent feasible, except where the site is of historic significance or is needed for park development.

PROJECT STATEMENT SHEET

2. Remove cross fencing to reduce wildlife migration barriers and prevent injury to wildlife.

3. Evaluate all man-made sites for historical significance and make management recommendations.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-CR	ADM	3.0	0.1
	PARK-CR	MON	2.0	0.1
		Subtotal:	5.0	0.2
Year 2:	PARK-CR	ADM	3.0	0.1
	PARK-CR	MON	2.0	0.1
		Subtotal:	5.0	0.2
Year 3:				
Year 4:				
		Total:	10.0	0.4

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	PARK-CR	MIT	20.0	0.5
	PARK-CR	ADM	5.0	0.2
		Subtotal:	25.0	0.7
Year 3:	PARK-CR	MIT	20.0	0.5
	PARK-CR	ADM	5.0	0.2
		Subtotal:	25.0	0.7
Year 4:	PARK-CR	MIT	20.0	0.5
	PARK-CR	ADM	5.0	0.2
		Subtotal:	25.0	0.7
		Total:	75.0	2.1

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

GUMO-I-001.000

PROJECT STATEMENT SHEET

1. No Action: If no action is initiated, man-made or developed water sources will continue to interfere with natural ecological processes.

COMPLIANCE CODE(s): NHPA

EXPLANATION: XXX Form

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-I-002.000

TITLE: MUSEUM COLLECTION

FUNDING STATUS: FUNDED: 60.0 UNFUNDED: 6.0

SERVICEWIDE ISSUES: C03 MUS CATALOGING

CULTURAL RESOURCE TYPE CODE: OBJC

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

The park's museum collection has over 700 accessions with over 47,000 natural and cultural items. Of these, only a portion are maintained by the park while the rest are stored at other institutions. The collection provides reference materials, study specimens, exhibit items, and research documentation for use by park employees, scientists, educational groups and other interested persons. Museum items include both natural and cultural items. Natural items such as vegetation voucher specimens, study skins of birds and mammals and a collection of different insects. Cultural items include: archeological items such as arrow points, basketry, and beads; Ranching and farming items such as branding irons, halters, plows, etc; and items of historical importance to the hsitory of the park. It also is utilized to preserve and protect archeological artifacts and other rare specimens that would otherwise deteriorate if left "in situ".

Curatorial responsibilities, including accessioning, cataloging, inventorying, preparing and preserving collection items, are assigned to the Chief, Division of Interpretation and Visitor Services. Curatorial work is assigned to a park employee 50 percent of the time. Until 1990, storage was a serious problem for the collection. In 1990, the move into the new visitor center complex provides space, temperature and humidity controls, and fire and intrusion alarms to safeguard the collection. Some storage problems still exist, especially with larger items.

Recent efforts to organize the collection have made significant progress. However, much still remains to be done. It is estimated that there are still over 40,000 items in the collection that need to be catalogued. Many of these items ar stored at other institutions and park records are incomplete.

Many biotic and abiotic specimens are collected annual under the park's collecting permit program. Records for these items need to be completed, and loan documents prepared for those stored at other institutions.

PROJECT STATEMENT SHEET

The Scope of Collection needs to be updated. Collection Management and Collection Storage Plans need to be developed for the park.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Revise the Scope of Collection Statement.

2. Prepare both a Collection Management Plan and a Collection Storage Plan. These two plan will take a comprehensive look at the collection needs and provide direction and recommendations for proper management.

3. Continue to maintain the collection according to NPS Museum Handbook Guidelines. Accession artifacts as they are obtained from the field to avoid a backlog.

4. Continue to provide staffing for the adequate administration of the collection.

5. Continue to update the museum records by accessioning of unrecorded items. Accessioning of unrecorded items, cataloguing of all accessioned items, establishment of accession folders, organization of a efficient filling system, and improved record-keeping on items loaned either on a temporary or indefinite basis are essential if curatorial standards are to be achieved and a functional collection developed.

6. Complete the comprehensive inventory of the total collection to provide an opportunity to cross-check museum items with catalogue and loan records, de-accession and transfer inappropriate or duplicate items, clean all items, and determine additional preservation or repair needs. Both in terms of preventive maintenance and assessiong the current status of the park's collection, such an inventory would be a critical step in providing a useful well-preserved collection.

BUDGET AND FTEs:

	FUNDED			
	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	PARK-CR	ADM	15.0	0.5
Year 2:	PARK-CR	ADM	15.0	0.5
Year 3:	PARK-CR	ADM	15.0	0.5
Year 4:	PARK-CR	ADM	15.0	0.5
		Total:	60.0	2.0

PROJECT STATEMENT SHEET

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	?		0.0	0.0
	REGN-CR	MIT	2.0	0.1
		Subtotal:	2.0	0.1
Year 3:	?		0.0	0.0
	REGN-CR	MIT	2.0	0.1
		Subtotal:	2.0	0.1
Year 4:	?		0.0	0.0
	REGN-CR	MIT	2.0	0.1
		Subtotal:	2.0	0.1
		Total:	6.0	0.3

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): NHPA

EXPLANATION: Museum Collection; NPS-28

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-I-003.000

TITLE: WELL AND MINING SITE RESTORATION

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 40.0

SERVICEWIDE ISSUES: N10 MINRL/GEOTHERM

CULTURAL RESOURCE TYPE CODE: N/A

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Prior to the establishment of the park, four oil and gas wells were drilled by different oil companies. These wells are known as the Texaco # 1, well drilled in the Pine Canyon, Standard Oil well drilled at the mouth of McKittrick Canyon, Hunter's Well drilled in the southern section of the park and Pure Oil well drilled on the western escarpment. In the Dog Canyon area of the park, there are approximately 10 abandoned mine shafts where copper was mined in the early 1920's-1940's.

The park is presently working with the NPS-Denver Office, Mining and Minerals Division and SW Regional Office, Mining and Minerals Division to obtain all pertient filing claims data on these well and mines. The Texas Railroad Commission is also working with the Denver Office in conducting an inventory of all mines in the State of Texas.
There may be other mine sites not currently on the parks' inventory.

One of the mines at Dog Canyon requires mitigation work. This work is needed to safe guard visitors hiking in the area and to prevent entry into this mine shaft. Mine shafts, being man-made are often unstable and therefore create a serious safety problem. There is also a need to evaluate oil well drilling records and debris left at abandoned oil wells sites throughout the park and determine safety conditions at these site.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Continue to update the park inventory on oil/gas and mining sites. Obtain all relevant documents on the oil/gas and mining activities prior to the establishment of the park.

2. Work with Denver and Regional office personnel to evaluate what type of mitigation work is needed to make the abandoned oil and gas sites safe for the future. Work with the Texas Railroad Commission, Denver and Regional office personnel to obtain funding for migitation on any mine shafts needing safety work in Dog Canyon to prevent entry into these mine shafts.

PROJECT STATEMENT SHEET

3. Continue to monitor these sites to insure public safety.

4. Evaluate all well and mining sites to determine any restoration needed and debris removal needed and do as necessary.

BUDGET AND FTEs:

FUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:				
Year 2:				
Year 3:				
Year 4:				
		Total:	0.0	0.0

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	NWASO-OTH	MIT	20.0	0.1
Year 3:	NWASO-OTH	MIT	20.0	0.1
Year 4:				
		Total:	40.0	0.2

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS:

1. No Action: If no action is taken abandoned oil and gas wells located throughout the park will not have any mitigation work done. The result could be unsafe abandoned wells on park lands where visitors might come in contact with them or possible contamination of the park's water supply. Mine shafts at Dog Canyon should be resurveyed and appropriate safety gates installed wherever needed.

COMPLIANCE CODE(s): EXCL

EXPLANATION: 516 DM2 App. 2, 2.2

Proposal Date: 92

PROJECT STATEMENT SHEET

PROJECT NUMBER: GUMO-I-004.000

TITLE: SOCIAL/ETHNOGRAPHIC OVERVIEW AND ASSESSMENT

FUNDING STATUS: FUNDED: 0.0 UNFUNDED: 10.0

SERVICEWIDE ISSUES: C04 ETHNOGRAPHY

CULTURAL RESOURCE TYPE CODE: ETHN

10-238 PACKAGE NUMBER:

PROBLEM STATEMENT:

Guadalupe Mountains National Park has nearly 200,000 visitors each year. While we know something of the demographics of these visitors, we know little about the ethnological base of these visitors.

We know little about the visitors who visit thes park or about their ways that they use and/or impact the park. In addition, little is know about the relationship with ethnic groups that historically or presently utilize park resources.

In order to respond both to affected publics and their needs and in order to manage park resourcxes to minimize i;mpact of visitors more information needs to be known about these visitors and how they use the park.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

1. Conduct an ethnographic overview and assessment of park visitors, how they relate to park resources and how they might impact park resources to give management information needed to be responsive to affected publics and to manage park resources.

BUDGET AND FTEs:

FUNDED			
Source	Act Type	Budget ($1000s)	FTEs
Year 1:			
Year 2:			
Year 3:			
Year 4:			
Total:		0.0	0.0

GUMO-I-004.000

PROJECT STATEMENT SHEET

UNFUNDED

	Source	Act Type	Budget ($1000s)	FTEs
Year 1:	?		0.0	0.0
Year 2:	REGN-CR	RES	5.0	0.1
Year 3:	REGN-CR	RES	5.0	0.1
Year 4:				
		Total:	10.0	0.2

(OPTIONAL) ALTERNATIVE ACTIONS/SOLUTIONS AND IMPACTS: N/A

COMPLIANCE CODE(s): NHPA

EXPLANATION: Section 106 Compliance

Proposal Date: 92

CULTURAL RESOURCE DOCUMENTATION CHECKLIST

Place an X in the appropriate column. Leave columns blank if document is not required for the park. Remember that items in the first section, PLANNING DOCUMENTS, may also apply to natural resources. See NPS-28, Chapter 2 for description of each inventory or study.

TITLE	CURRENT AND APPROVED	INCOMPLETE; NEEDS REVISION OR UPDATING	NEEDED
PLANNING DOCUMENTS			
Preauthorization and Authorization	x		
Statement for Management (SFM)		x	
Outline of Planning Requirements (OPR)		x	
General Management Plan (GMP)		x	
Development Concept Plan (DCP)		x	
Resources Management Plan (RMP)		x	
Interpretive Prospectus (IP)	x		
SERVICEWIDE INVENTORIES, LISTS, CATALOGS, AND REGISTERS			
Cultural Resources Bibliography (CRBIB)			x
Cultural Sites Inventory (CSI)		x	
List of Classified Structures (LCS)		x	
National Catalog of Museum Objects		x	
National Register of Historic Places		x	
BASIC CULTURAL RESOURCE DOCUMENTS			
Archeological Overview and Assessment		x	
Archeological Identification Studies		x	
Archeological Evaluation Studies		x	

CULTURAL RESOURCE DOCUMENTATION CHECKLIST

TITLE	CURRENT AND APPROVED	INCOMPLETE; NEEDS REVISION OR UPDATING	NEEDED
BASIC CULTURAL RESOURCE DOCUMENTS (cont.)			
Ethnographic Overview & Assessment			x
Ethnographic Oral Histories & Life Histories		x	
Ethnographic Program			x
Historical Base Map	x		
Historic Resource Study (HRS)			x
Park Administrative History	x		
Scope of Collection Statement		x	
SPECIAL RESOURCE STUDIES AND PLANS			
Archeological & Ethno. Collections Studies		x	
Archeological Data Recovery Studies		x	
Collection Management Plan			x
Collection Storage Plan			x
Collection Condition Survey		x	
Cultural Landscape Report (CLR)			x
Ethnohistory		x	
Exhibit Plan	x		
Historic Furnishings Report			x
Historic Structure Preservation Guide (HSPG)		x	
Historic Structure Report		x	
Social Impact Study			x
Special History Study			x
Traditional Use Study			x

SUMMARY CHART FOR ARCHEOLOGICAL SITES

Significance		Condition					Impacts				Documentation		
		Good	Fair	Poor	Destroyed	Unknown	Severe	Moderate	Low	Unknown	Good	Fair	Poor
National													
State & Regional	304		304					4	300		304		
Local													
Not Evaluated	27	27							27		27		
TOTALS	331	27						4	327		331		

SUMMARY CHART FOR STRUCTURES

Significance		Condition				Impacts				Documentation		
		Good	Fair	Poor	Unknown	Severe	Moderate	Low	Unknown	Good	Fair	Poor
National	1			1				1			1	
State & Regional	25		23	2			11	14		8	17	
Local												
Not Evaluated	3		3				3				3	
TOTALS	29		26	3			14	15		8	21	

SUMMARY CHART FOR OBJECTS

DOCUMENTATION Form 10-254 Submitted to National Catalog at Harper's Ferry	Archeology	Ethnology	History	Archives	Biology	Paleontology	Geology	TOTALS
Registration Data Only								
Registration & Catalog Data	722		155		12	36	218	1,143
Total Items Cataloged	5,856		155		12	36	218	6,277
Backlog to be Cataloged	25,204		200	14,159	1,700		50	41,313
Total Collection Summary	31,060		355	14,159	1,712	36	268	47,590

250

CONDITION The percentage of collection in the following categories.	Archeology	Ethnology	History	Archives	Biology	Paleontology	Geology
Excellent							
Good							
Fair							
Poor							
Unknown	31,060		355	14,159	1,712	36	268

SUMMARY CHART FOR CULTURAL LANDSCAPES

Significance		Condition				Impacts				Documentation		
		Good	Fair	Poor	Unknown	Severe	Moderate	Low	Unknown	Good	Fair	Poor
National												
State & Regional												
Local												
Not Evaluated	4		4					4			4	
TOTALS	4		4					4			4	

The following action plans are referenced in this resources management plan:

1. Backcountry Management Plan, 1985.

2. Cave Management Plan, 1991.

3. Collecting Permit-Standard Operating Procedure (SOP), 1988.

4. Fire Management Plan, 1985.

5. McKittrick Pennyroyal Recovery Plan, 1985.

6. Mountain Lion Management Plan for Carlsbad Caverns and Guadalupe Mountains National Parks, 1986.

7. Peregrine Falcon Recovery Plan, 1984.

8. Sneed and Lee Pincushion Recovery Plan, 1986.

Annual Project Status and Accomplishments Report

In 1988, C15 Administrative History was completed.

In 1989, N15 Boundary Fencing, five miles of boundary fence was constructed.

In 1990, N15 Boundary Fencing, 10 miles of boundary fence was constructed.

ARCHEOLOGY

Applegarth, Susan M. 1976. Prehistoric utilization of the environment of the eastern slopes of the Guadalupe Mountains, southeastern New Mexico. Ph.D. dissertation, Univ. Wisconsin, Madison. 325 pp.

Ayer, Mary Y. 1936. The archaeological and faunal material from Williams Cave, Guadalupe Mountains, Texas. Proc. Acad. Nat. Sci., Philadelphia 88:599-618.

Baker, James K. 1960. Early man in Carlsbad. NSS News 18:47.

Banks, K. 1977. Prehistoric settlement in the Salt Basin, Texas. Pp. 1-14 in Transactions of the 12th regional archeological symposium for southeastern New Mexico and western Texas. El Paso.

_____. 1979. Prehistoric settlement in the Three-mile and Sulphur Draw watersheds. Report on file with the Soil Conservation Service, Temple, and Dept. Anthrop., Southern Methodist Univ., Dallas, Texas.

Beckett, P. H., M. C. Strong, and S. M. Strong. 1977. Nomad trail archeological project in Eddy County, New Mexico. Cultural Resources Mgmt. Div., Dept. Sociol. and Anthrop., New Mexico State Univ., Rept. 64. Las Cruces.

Bilbo, Michael J. and Kay Sutherland. 1975. Pine Spring Canyon pictograph site in the Guadalupe Mountains National Park, Texas. Unpubl. rept. 15 pp.

Blaine, Jerrylee. 1970. A view from camp. TAS Ann. Herald. Pp. 18-23.

Boisvert, Richard. 1980. A technological analysis of lithic assemblages from the Guadalupe Mountains National Park, Texas. M.A. thesis, Texas Tech Univ., Lubbock. 237 pp.

Bousman, C. Britt. 1974a. An archeological assessment of Carlsbad Caverns National Park. Archaeol. Research Program. Southern Methodist Univ., Dallas, Texas. 46 pp.

_____. 1974b. An archeological reconnaissance of Brantley Reservoir. Rept. prepared by the Archaeol. Research Program, Southern Methodist Univ., Dallas, Texas.

Bradfield, Wesley. 1928. A preliminary survey of the archeology of southeastern New Mexico. El Palacio 24:99-112.

Bradford, James E. 1980. Upper Dog Canyon archeology. Southwest Cultural Resources Ctr., NPS, Southwest Region,

Santa Fe, New Mexico. 60 pp.

Bradley, Zorro A. 1959. Cave site A-08, Carlsbad Caverns National Park. Unpubl. rept. 23 pp.

Brook, Vernon R. 1965. Cultural traits of the El Paso Phase of the Mogollon. Southeastern New Mexico and West Texas symposium papers, Lea County Archaeol. Soc. Bull. 1:18-22.

Burnet, R. M. 1933. Antiquity of man in the Pecos Valley of New Mexico. New Mexico Mag. 11:24-26, 61.

_____. 1937. Early man and extinct fauna of the Carlsbad region. New Mexico Anthropol. 8:44-45.

Burnet, R. M. and C. T. R. Bohannon. 1973a. Popular reconnaissance report on the Guadalupe Mountains, season of 1936. Unpubl. Ms. 10 pp.

_____. 1937b. A reconnaissance in the Guadalupes. Archaeol. rept. Unpubl. Ms. 31 pp.

_____. 1937c. A reconnaissance of the Guadalupe Mountains, New Mexico for the Pennsylvania Univ. Mus. Unpubl. Ms.

Burns, Barney Tillman. 1964. A method for identification of southwestern Apache sites. Unpubl. Ms. on file with the Univ. Arizona, Tucson.

_____. 1967. The archaeology of the Carlsbad District, southeastern New Mexico. B.A. thesis, Univ. Arizona, Tucson. 134 pp.

_____. 1972. A method for the location and recognition of southwestern Apache sites. Unpubl. Ms.

Clark, John W., Jr. 1974. Rock art of the Guadalupe Mountains National Park area. Texas Archeol. Soc. 45:97-119.

Corley, John A. 1965. Proposed eastern extension of the Jornada Branch of the Mogollon Culture. Lea County Archaeol. Soc. Bull. 1:30-36.

Ferdon, Edwin N., Jr. 1946. An excavation of Hermit's Cave, New Mexico. Monogr. School Am. Research, No. 10.

Fewkes, J. Walter. 1925. Prehistoric objects from caves in southern New Mexico. Unpubl. rept. 8 pp.

Gebhardt, David. 1962. Prehistoric rock drawings at Painted Grotto, New Mexico. El Palacio 69:218-223.

Gerald, Rex E. 1973a. An evaluation of the impact of planned

park service facilities expansion on the cultural and historical resources of a specific area in Slaughter Canyon, Carlsbad Caverns National Park, New Mexico. Ecology Audits, Inc. Univ. Texas, El Paso. 14 pp.

_____. 1973b. Evaluation of the impact on cultural resources of a tramway and of planned facilities development in specific areas of Guadalupe Mountains National Park, Texas. Unpubl. rept. by Ecology Audits, Inc. Univ. Texas, El Paso. 26 pp.

Goodell, R. Kent. 1972. Guadalupe lithics, an analysis. Unpubl. rept. 8 pp.

Green, John W. 1969. Sitting Bull Falls pictograph site: EPAS-49. The Artifact 5:1-19.

Greer, John W. 1965a. Report on preliminary archeological exploration at Carlsbad Caverns National Park, New Mexico. Unpubl. rept. Univ. Texas, Austin. 49 pp.

_____. 1965b. A typology of midden circles and mescal pits. Southwestern Lore 31:41-55.

_____. 1966. Preliminary archaeological exploration at Carlsbad Caverns National Park, New Mexico. Unpubl. Ms. Univ. Texas, Austin.

_____. 1967a. Midden circles versus mescal pits. Am. Antiquity 32:108-109.

_____. 1967b. Some C-14 dates from midden circle sites. Unpubl. Ms.

_____. 1967c. Excavations at a midden circle site in El Paso county, Texas. Bull. Texas Archeol. Soc. 39:111-131.

_____. 1968. Notes on excavated ring midden sites, 1963-1968. Bull. Texas Archeol. Soc. 38:39-44.

_____. 1975. On sotol, seasonality, and ring middens. Texas Archeol. 19:5-9.

Hammersen, M. M. 1972. The prehistoric Mogollon culture and its regional aspects in El Paso area. The Artifact 10:15-26.

Henderson, M. 1976. An archaeological inventory of Brantley Reservoir, New Mexico. Dept. Anthropol., Southern Methodist Univ., Dallas, Texas. Contrib. in Anthropol. 18.

Howard, Edgar B. 1930a. Archaeological research in the Guadalupe Mountains. Univ. Penn. Mus. J. 21:188-213.

_____. 1930b. The New Mexico - Texas excavations. Univ.

Penn. Mus. Bull. 2:46-49.

_____. 1931. Field-work in the Southwest. Univ. Penn. Mus. Bull. 3:11-14.

_____. 1932a. Caves along the slopes of the Guadalupe Mountains. Pp. 7-19 in Texas Archeol. and Paleontol. Soc. Bull. No. 4.

_____. 1932b. Prehistoric finds in New Mexico. Univ. Penn. Mus. Bull. 4:25-26.

Jelinek, Arthur. 1958. Archaeological materials from the Middle Pecos River Valley, New Mexico. Papers of the Michigan Acad. Sci. Arts and Letters 43:159-168.

_____. 1967. A prehistoric sequence in the Middle Pecos Valley, New Mexico. Mus. Anthropol., Univ. Michigan, Ann Arbor. Anthropol. Papers 31.

Katz, Paul R. (appendix by Susanna R. Katz). 1978. An inventory and assessment of archaeological sites in the high country of Guadalupe Mountains National Park, Texas. Univ. Texas, San Antonio, Archeol. Serv. Rept. No. 36. 91 pp.

Katz, Paul R. and Susanna R. Katz. 1974. Preliminary report of activities of the 1974 Texas Tech University Archaeological Field School in Guadalupe Mountains National Park, Texas. Unpubl. rept. 24 pp.

_____. 1975. A summary of recent archaeological investigations in Guadalupe Mountains National Park by the Dept. of Anthropol., Texas Tech Univ., Lubbock. Archeol. 19:11-15.

_____. 1977. Recent investigations in the southern Guadalupe Mountains locality of west Texas. Submitted for publ. in Transactions of the 12th regional archaeological symposium for southeastern New Mexico and western Texas. To be publ. by El Paso Archeol. Soc.

_____. 1979. A status report on research into the prehistory of Guadalupe Mountains National Park. Pp. 359-370 in Jornada Mogollan Archeol.

Katz, P. R. and P. D. Lukowski. No date. Results of archaeological survey in the Salt Flat locality of northern Hudspeth County, Texas. Rept. prepared for publ. by the Nat. Areas Survey, Univ. Texas, Austin.

Katz, Susanna R. and Paul R. Katz. 1974. An inventory and interpretation of prehistoric resources in Guadalupe Mountains National Park, Texas. Rept. to NPS. Texas Tech Univ., Lubbock. 70 pp.

Kelley, J. Charles. 1950. Atlatls, bows and arrows, pictographs and the Pecos River focus. Am. Antiq. 16:71-74.

Ice, Ronald J. 1974. Archeology survey of McKittrick Canyon entrance road. Unpubl. rept. 2 pp.

Lehmer, D. J. 1948. The Jornada Branch of the Mogollon. Univ. Arizona, Social Sci. Bull. 17. Tuscon.

_____. 1960. A review of Trans-Pecos Texas Archeology. Bull. Texas Archeol. Soc. 19 (for 1958):109-144.

Markley, Max C. 1941. Distribution of Pueblo pottery in southeastern New Mexico. The Minnesota Archeologists 7:2.

Mera, H. P. 1933. Mescal pits - a misnomer. Sci. 77:1989:168-169.

_____. 1938. Reconnaissance and excavation in southeastern New Mexico. Mem. of the Am. Anthropol. Assoc. 51.

_____. 1943. An outline of ceramic development in southern and southeastern New Mexico. Lav. Anthropol. Tech. series 11.

Nordby, Larry V. 1978. An archaeological survey of proposed development areas at Carlsbad Caverns and Guadalupe Mountains National Parks. Unpubl. rept. 9 pp.

Phelps, Alan L. 1974. An analysis of the ceramics of the Guadalupe Mountains National Park. Texas Archeol. Soc. 45:121-150.

Riches, S. M. 1970. Archaeological survey of the eastern Guadalupe Mountains, New Mexico. M.S. thesis, Univ. Wisconsin, Madison.

Runyon, John W. 1970. Pottery analysis for Texas Archaeological Society on McKittrick National Park survey. Pine Springs, Texas. 10 pp.

Schaafsma, Polly. 1972. Rock art in New Mexico. New Mexico State Planning Office, Santa Fe.

Schroeder, Albert H. (compiler). No date (received 1978). Pratt Cave studies, Guadalupe Mountains National Park, Texas. 348 pp.

Schultz, C. B. and E. B. Howard. 1935. The fauna of Burnet Cave, Guadalupe Mountains, New Mexico. Proc. Acad. Nat. Sci. 87:272-298.

Shafer, Harry J. 1970. Texas Archaeological Society's Guadalupe Mountains National Park survey: a preliminary report. 14 pp.

Skinner, S. Alan and C. Britt Bousman. 1973. Prehistoric archaeology in the Three-mile and Sulfur Draw watershed, Rept. submitted to the Soil Conserv. Service by the Archaeology Research Program, Southern Methodist Univ., Dallas, Texas.

Sommers, Arnold. 1968. Parker Ranch ring midden #1. Pp. 9-17 in Transactions of the 4th Regional Conf.

Spangle, Paul F. (ed.). 1960. The first inhabitants of the region. Pp. 19-20 in Guidebook to Carlsbad Caverns National Park. The Natl. Speleol. Soc., Washington, D. C.

Spangle, Paul F., Farland J. Gordon, and John B. Johnson. 1959. Preliminary report on the archaeological survey of Carlsbad Caverns National Park.

Taylor, W. W. 1966. Archaic cultures adjacent to the northeastern frontiers of Mesoamerica. Pp. 59-94 in Handbook of middle American Indians, vol. 4: Archeological frontiers and external connections (G. F. Ekholm and G. R. Willey, eds.). Univ. Texas Press, Austin.

Whalen, M. R. 1977. Settlement patterns of the eastern Hueco Bolson. El Paso Centennial Mus., Univ. Texas, El Paso, Anthropol. Paper 4.

_____. 1978. Settlement patterns of the western Hueco Bolson. El Paso Centennial Mus., Univ. Texas, El Paso, Anthropol. Paper 6.

Williams, Jack R. 1956. The Indians of Carlsbad Caverns National Park. Carlsbad Caverns Nat. Hist. Assoc. 44 pp.

CAVES

Ahlstrand, Gary. 1977. Alpha radiation associated studies at Carlsbad Caverns. Pp. 71-74 in National Cave Mgmt. Symposium Proc. (Tom Aley and Doug Rhodes, eds.). Mountain View, Arkansas, 1976.

_____. 1980. Alpha radiation levels in two caves related to external air temperature and atmospheric pressure. NSS Bull. 42:39-41. July.

Ahlstrand, Gary M. and Patricia L. Fry. 1978. Alpha radiation project at Carlsbad Caverns: two years and still counting. Pp. 133-137 in National Cave Mgmt. Symposium Proc. (Ron Zuber, James Chester, Stephanie Gilbert, and Doug Rhodes, eds.). Big Sky, Montana, 1977.

_____. 1979. Alpha radiation monitoring at Carlsbad Caverns National Park. pp. 691-693 in Proc. First Conf. Sci. Research in the National Parks, vol. II (R. H. Linn, ed.). New Orleans, Louisiana. 1976.

Allison, Vernon C. 1937. Evening bat flight from Carlsbad Caverns. J. Mammal. 18:80-82.

Baker, C. L. 1924. Caverns in the Guadalupe Mountain Range. Sci. 59:379.

Black, Donald M. 1951a. Cave pearls in Carlsbad Caverns. Sci. Monthly 74:206-210.

_____. 1951b. Loose carbonate accretions from Carlsbad Caverns, New Mexico. Sci. 114:126-127.

_____. 1951c. Origin and development of "positive" water catchment basins, Carlsbad Caverns, New Mexico. NSS Bull. 13:27-29.

_____. 1953. Aragonite rafts in Carlsbad Caverns, New Mexico. Sci. 117:84-85.

_____. 1954. Origin and development of the Carlsbad Caverns. Pp. 136-142 in New Mexico Geol. Soc. Guidebook to Southeastern New Mexico.

Boyer, Paul S. 1964. Analysis of cave waters from Carlsbad Caverns, New Mexico. Senior thesis, Princeton Univ. Princeton, New Jersey. 58 pp.

Bretz, J. J. 1948. Carlsbad Caverns and other caves of the Guadalupe block, New Mexico. J. Geol. 57:447-483.

Bullington, Neal. 1968. Geology of Carlsbad Caverns. Pp. 20-23 in West Texas Geol. Soc. Guidebook, Fall 1968, Publ. No. 68-55.

Burnet, R. M. 1938. Exploring a New Cave. Nat. Hist. 41:374-383.

Caldwell, Douglas. 1977. Examination of moon milk and iron pools in Left Hand Tunnel of Carlsbad Caverns. P. 3 in CRF 1976 Ann. Rept.

Cave Research Foundation. 1975. New Cave Map Cards.

Cave Research Foundation. 1988. Cave Research Foundation Annual Report-1988. Cave Books, St. Louis, MO. 75 pp.

Davies, William E. 1964. Attapulgite from Carlsbad Caverns, New Mexico. U. S. Geol. Surv. Prof. Paper 501-C. Pp. 682-683.

Davis, Donald G. 1970. Folia in Carlsbad Caverns. Unpubl. rept. 2 pp.

_____. 1979. Geology and speleogenesis of Ogle Cave: Discussion. NSS Bull. 42:21-22. January.

_____. 1980. Cave development in the Guadalupe Mountains (A critical review of recent hypotheses). NSS Bull. 42:42-48.

Folk, Robert L. and Riccordo Assereto. 1976. Comparative fabrics of length-slow and length-fast calcite and calcitized aragonite in a Holocene speleothem, Carlsbad Caverns, New Mexico. J. Sedimentary Petrol. 46:486-496.

Hill, Carol A. 1990. Sulfuric Acid Speleogenesis of Carlsbad Caverns and its Relationship to Hydrocarbons, Delaware Basin New Mexico and Texas. The American Association of Petroleum Geologists Bulletin. V. 74. No. 11. p. 1685-1694.

Hill, Carol A. 1973a. Guadalupe Cave Survey mineralogical report for field trip of 27 May 1973. Unpubl. rept. 7 pp.

_____. 1973b. Huntite flowstone in Carlsbad Caverns, New Mexico. Sci. 181:158-159.

_____. 1973c. Mineralogy of Carlsbad Caverns and caves of the Guadalupe Mountains. Pp. 27-30 in CRF 1973 Ann. Rept.

_____. 1977. Mineralogy of Musk Ox Cave, Carlsbad Caverns National Park. P. 30 in CRF 1976 Ann. Rept.

_____. 1978a. Mineralogy of Ogle Cave. NSS Bull. 40:19-24. January.

_____. 1978b. Mineralogy of the Pink Caves, Guadalupe Mountains, New Mexico. P. 15 in CRF 1977 Ann. Rept.

_____. 1979. Cave nitrates. Typed Ms. 125 pp.

Hill, Carol A., D. H. Jagnow, and D. Deal. 1972. Guadalupe Cave Survey mineralogical report for geology field trip of 12 February 1972. Guadalupe Cave Survey Rept. 7 pp.

Jagnow, David H. 1977. Geologic factors influencing speleogenesis in the Capitan reef complex, New Mexico and Texas. M.S. thesis, Univ. New Mexico, Albuquerque. 201 pp.

_____. 1978. Geology and speleogenesis of Ogle Cave. NSS Bull. 40:7-18. January.

_____. 1979. Cavern development in the Guadalupe Mountains. Cave Research Foundation, Adobe Press, Albuquerque. 55 pp.

Kirkland, Douglas W. 1981. Origin of gypsum deposits in Carlsbad Caverns, New Mexico. Unpubl Ms. 8 pp.

Moore, G. W. 1960. Geology of Carlsbad Caverns, New Mexico. Pp. 10-17 in Guidebook to Carlsbad Caverns National Park. NSS Guidebook, Series No. 1.

Moran, William R. 1955. Sandstone in New Mexico Room of Carlsbad Caverns, New Mexico. Bull. Am. Assoc. Petrol. Geol. 38:256-259.

Motts, W. S. 1959. Age of the Carlsbad Caverns and related caves in rocks of Guadalupe age west of the Pecos River in southeastern New Mexico (abs.). Geol. Soc. Am. Bull. 70:1737.

Palmer, Arthur, Margaret V. Palmer, and J. Michael Queen. 1978. Speleogenesis in the Guadalupe Mountains, New Mexico: gypsum replacement of carbonate by brine mixing. Pp. 22-23 in CRF 1977 Ann. Rept.

Queen, J. Michael. 1980. Preliminary report on observations and samples from the secondary stream passage, Carlsbad Caverns, including the description and interpretation of two samples of the "Popcorn Line." Typed Ms. 6 pp.

Rohde, Katherine. 1978. Records of cave restoration activities (no title). Unpubl. records.

Rohde, Katherine and Ronal Kerbo. 1978. Cave restoration - an interview of correcting overviewing. Pp. 58-59 in National Cave Mgmt. Symposium Proc. (Ron Zuber, James Chester, Stephanie Gilbert, and Doug Rhodes, eds.). Big Sky, Montana.

Stitt, Robert A. land William Bishop. 1972. Underground Wilderness in the Guadalupe Escarpment. Bulletin of the National Speleological Society. p. 77-88.

Thrailkill, John V. 1965. Studies in the excavation of limestone caves and the deposition of speleothems. Ph. D. dissertation. Princeton Univ., Princeton, New Jersey. 193 pp.

_____. 1971. Carbonate deposition in Carlsbad Caverns. J. Geol. 79:683-695.

Tomer, D. W. 1975. Ogle Cave stalagmite study of March 1975. Unpubl. rept. 4 pp.

U.S. Department of Interior. 1991. Cave Management Plan for Guadalupe Mountains National Park. National Park Service. 26 pp.

Van Cleave, Philip F. 1976a. Radon in Carlsbad Caverns and caves in the surrounding area. P. 120 in National Cave Mgmt. Symposium Proc., Albuquerque, New Mexico. 1975.

_____. 1976b. Existing cave-related plans and programs at Carlsbad Caverns National Park. P. 138 in National Cave Mgmt. Symposium Proc., Albuquerque, New Mexico. 1975.

Welbourn, Calvin. 1974. Research activities of the Cave Research Foundation at Carlsbad Caverns and Guadalupe Mountains National Parks. Pp. 88-91 in Trans. of Southwest Region Nat. Sci. Conf., Santa Fe, New Mexico.

Yarborough, Keith A. 1976a. Radiation levels in natural caves administered be the National Park Service. 7 pp.

_____. 1976b. Alpha radiation monitoring of National Park Service administered caves in the United States. 17 pp.

_____. 1976c. Radiation monitoring in National Park Service Caves. 10 pp.

_____. 1976d. Radiation study done in National Park Service Caves. NSS News 34:146-148.

_____. 1976e. Investigation of radiation produced by Radon and Thoron in natural caves administered by the National Park Service. 22 pp.

_____. 1977a. Investigation of radiation produced by Radon and Thoron in natural caves administered by the National Park Service. Pp. 59-69 in National Cave Mgmt. Symposium Proc. (Tom Aley and Doug Rhodes, eds.). Mountain View, Arkansas. 1976.

_____. 1977b. Measurements of seasonal and daily Radon daughter concentration fluctuations in National Park Service caves. 12 pp.

_____. 1978. Airborne alpha radiation in natural caves administered by the National Park Service. Pp. 125-132 in National Cave Mgmt. Symposium Proc. (Ron Zuber, James Chester, Stephanie Gilbert, and Doug Rhodes, eds.). Big Sky, Montana. 1977.

FAUNA

Ahlstrand, Gary M. 1980. The status of Barbary sheep in national parks. Pp. 19 in Proceedings of the symposium on ecology and management of Barbary sheep, Nov. 19-21, 1978, Texas Tech Univ., Lubbock.

Altenbach, J. Scott, Kenneth N. Geluso, and Don E. Wilson. 1979. Population size of Tadarida brasiliensis at Carlsbad Caverns in 1973. Pp. 341-348 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Anderson, Allen E., Walter A. Snyder, and George W. Brown. 1965. Stomach content analysis related to condition in mule deer, Guadalupe Mountains, New Mexico. J. Wildl. Mgmt. 29:352-366.

Applegate, H. E., W. Hanselka, and D. D. Culley. 1971. Effect of insecticides on the ecosystem in the northern Chihuahuan Desert. In Food, fiber and the arid lands (W. G. McGinnies, B. J. Goldman, and P. Paylore, eds.). Univ. of Arizona, Tucson.

August, Peter V., John W. Clarke, M. Houston McCaugh, and Robert L. Packard. 1979. Demographic patterns of small mammals: a possible use in impact assessment. Pp. 333-340 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Axtell, Ralph W. 1977. Ancient playas and their influence on recent herpeto-fauna of the northern Chihuahuan Desert. Pp. 493-512 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

Baker, James K. and Paul F. Spangle. 1962. Some observations on the flight habits of Mexican freetail bats. Southwestern Nat. 7:76-77.

Baker, Robert J., Hugh H. Genoways, Robert L. Packard, John E. Cornely, Margaret A. O'Connell, James W. Cottrell, and Dallas E. Wilhelm, Jr. 1974. Survey of mammals of Guadalupe Mountains National Park, Texas. Pp. 7-11 in Transactions of Southwest Regional Nat. Sci. Conf. NPS, Santa Fe, New Mexico.

Baker, Robert J. and H. Genoways. 1975. Annual report on the survey of the mammals of Guadalupe Mountains National Park. Pp. 85-181 in Studies in vascular plants, mammal survey, and data analysis, Guadalupe Mountains National park, Texas. January. Texas Tech Univ., Lubbock.

Barlow, Jon C. 1977. Effects of habitat attrition of vireo distribution and population density in the northern Chihuahuan Desert. Pp. 591-596 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

Bednarz, James C. 1981. Peregrine falcon habitat evaluation and proposed management plan for the Guadalupe Mountains, New Mexico and Texas. Final rept. submitted to USFS and NPS. 32 pp.

Belardo, Steven J., Fridrik R. Fridriksson, Elizabeth L. Belardo. 1977. Peregrine breeding behavior at the Agua Dulce eyrie, Lincoln National Forest, New Mexico: A successful transplant of captive-bred young. CDRI Contrib. No. 38, USFS Wildl. Habitat Tech. Bull. No. 7. 31 pp.

Bequaert, Joseph C. 1966. The molluscan fauna of the Guadalupe Mountains in Culberson County, Texas. Unpubl. rept. Tuscon, Arizona. 11 pp.

Biaggi, Virgilio, Jr. 1942. The birds of Culberson County, Texas with notes on ecological aspects. Unpubl. rept. 38 pp.

Blanchard, Andre. 1972. More new moths from Texas (Noctuidae). J. Lepidopterists' Soc. 26:56-63.

Bond, R. M. 1946. Peregrine population of western North America. Condor 48:101-116.

Burleigh, Thomas D. and George H. Lowery, Jr. 1940. Birds of the Guadalupe Mountains region of western Texas. Occasional Papers, Mus. Zool., No. 8. Louisiana State Univ. Press, Baton Rouge. 67 pp.

Chihuahuan Desert Research Institute. 1977. Nesting peregrine falcons in Texas, 1977. CDRI Contrib. No. 37. Prepared for Texas Parks and Wildl. Dept. 57 pp.

Cornely, John E. 1979. Ecological distribution of woodrats (Genus Neotoma) in Guadalupe Mountains National Park, Texas. Pp. 373-394 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Conant, Roger. 1977. Semiaquatic reptiles and amphibians of the Chihuahuan Desert and their relationships to drainage patterns of the region. Pp. 455-491 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

Davila, Vidal. 1990. The Reintroduction of Montezuma Quail (Cyrtonyx montezumae) in Guadalupe Mountains National Park, Texas-A Status Report. National Park Service. Unpublished report. 10 pp.

Davila, Vidal. 1990. The Status of the Black Bear, Ursus americanus, in Guadalupe Mountains National Park. Unpublished report. National Park Service. Unpublished Report. 8 pp.

Davila, Vidal. 1991. Endangered and Threatened Species in Guadalupe Mountains National Park, Texas. Presented at the Texas Academy of Science 94th Annual Meeting. March 1, 1991. 12 pp.

Davis, William B. 1940. Mammals of the Guadalupe Mountains of western Texas. Pp. 69-84 in Occasional Papers, Mus. Zool., No. 7. Louisiana State Univ. Press. Baton Rouge.

Dickinson, Tony G. and C. David Simpson. 1979a. Dispersal and establishment of Barbary sheep in the southern Great Plains. Final rept. submitted to NPS. 52 pp.

_____. 1979b. Dispersal and establishment of Barbary sheep in southeast New Mexico. Tech. Paper No. T-9-000 of College of Agr, Texas Tech Univ., Lubbock. 21 pp.

_____. 1980a. Dispersal and establishment of Barbary sheep in southeast New Mexico. Pp. 33-45 in Proceedings of the symposium on ecology and management of Barbary sheep (C. David Simpson, ed.). Texas Tech Univ., Lubbock.

_____. 1980b. Home range, movements, and topographic selection of Barbary sheep in the Guadalupe Mountains, New Mexico. Pp. 78-86 in Proceedings of the symposium on ecology and management of Barbary sheep (C. David Simpson, ed.). Texas Tech Univ., Lubbock.

Degenhardt, William G. and Paula B. Degenhardt. 1965. The host-parasite relationship between Elaphe subocularis (Reptilia: Colubridae) and Aponomma elaphensis (Acarina: Ixodidae). Southwestern Nat. 10:167-178.

Elliot, William R. and Sigurd Szerlip. 1972. Biology of the Guadalupe cave area. Pp. 47 in CRF Ann. Rept.

Findley, James S. and William Caire. 1977. The status of mammals in the northern region of the Chihuahuan Desert. Pp. 127-139 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

Foster, David E. and David D. Ralston. 1977a. Annual report on survey of insects, Guadalupe Mountains National Park, Texas. Typewritten rept. to NPS, Southwest Region, Santa Fe, New Mexico. 10 pp.

_____. 1977b. Final report for 1976, survey of insects. Typewritten report to NPS, Southwest Region, Santa Fe, New Mexico. 10 pp.

_____. 1978. Survey of insects - Guadalupe Mountains National Park, Texas. Report on studies for 1976 and 1977. 23 pp.

Fullington, Richard W. 1979. The land and freshwater mollusca of the Guadalupe Mountains National Park, Texas. Pp. 91-111 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Fullington, Richard W. and Don Harrington. 1979. Plusiotis woodi and Plusiotis gloriosa (Scarabaeidae): first report of the Guadalupe Mountains National Park, Texas. Pp. 113-114 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Gehlbach, Frederick R. 1964. Amphibians and reptiles of Carlsbad Caverns National Park, New Mexico, and adjacent Guadalupe Mountains. Unpubl. checklist. 10 pp.

_____. 1973a. Notes on the herpetological specimens from Eddy and Chavez Counties, New Mexico: Culberson and Hudspeth Counties, Texas in 14 major collections. Unpubl. rept. 20 pp.

_____. 1973b. Guadalupe Mountains region locality records for amphibians and reptiles, 1973. Mimeographed Ms.

Geluso, Ken, Scott Altenbach, and Don Wilson. 1974. Infant mortality of Tadarida brasiliensis at Carlsbad Caverns National Park in 1973 and 1974. P. 150 in Transactions of Southwest Region Nat. Sci. Conf., NPS, Santa Fe, New Mexico.

_____. 1975. Factors affecting declines in populations of Tadarida brasiliensis. Typewritten report to NPS, Southwest Region, Santa Fe, New Mexico. 10 pp.

_____. 1976a. Factors affecting declines in populations of Tadarida brasiliensis. Typewritten report to NPS, Southwest Region, Santa Fe, New Mexico. 10 pp.

_____. 1976b. Bat mortality: pesticide poisoning and migratory stress. Sci. 194:184-186.

_____. 1977. Factors affecting declines in populations of Tadarida brasiliensis. Typewritten report to NPS, Southwest Region, Santa Fe, New Mexico. 9 pp.

_____. 1981. Organochlorine residues in young Mexico free-tailed bats from several roosts. Am. Midland Nat. 105:249-257.

Genoways, Hugh H. and Robert J. Baker. 1974. Annual report on survey of mammals - Guadalupe Mountains National Park, Texas. Pp. 25-42 in 1974 Annual Report on Guadalupe Mountains studies. Texas Tech Univ., Lubbock.

Genoways, Hugh H., R. J. Baker, and John E. Cornely. 1977. Third annual report on the survey of mammals - Guadalupe Mountains National Park, Texas. Pp. 66-100 in Third annual report - biological investigations and information storage and retrieval system, Guadalupe Mountains National Park, Texas. January. Texas Tech Univ., Lubbock.

_____. 1979. Mammals of the Guadalupe Mountains National Park, Texas. Pp. 271-332 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Glass, Michael, Roger E. Reisch, and Gary M. Ahlstrand. 1974. Range condition survey and wildlife browse analysis, Carlsbad Caverns and Guadalupe Mountains National Parks. Unpubl. rept. 32 pp.

Gosnell, Mariana. 1977. Carlsbad's famous bats are dying off. Natl. Wildl. 15:29-33.

Grace, Jim W. 1980. The herpetofauna of Guadalupe Mountains National Park. Final rept. to CPSU, NPS, Southwest Region, Santa Fe, New Mexico. 174 pp. March.

Gross, J. E. 1960. History, and present and future status of the desert bighorn sheep (Ovis canadensis mexicana) in the Guadalupe Mountains of southeastern New Mexico and northwestern Texas. Trans. Desert Bighorn Council 4:66-71.

Hailey, Tommy L. 1977. Past, present and future status of the desert bighorn in the Chihuahuan Desert region. Pp. 217-225 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

----------. 1986. A Handbook for Pronghorn Antelope Management in Texas. Texas Parks and Wildlife Department. FA Report Series No. 20. 59 pp.

Hubbard, John P. and Claudia L. 1979. Birds of New Mexico's national parks lands. Tecolote Press. 38 pp.

Humphrey, Stephen R. 1971. Photographic estimation of population size of the Mexican free-tailed bat, Tadarida brasiliensis. Am. Midland Nat. 86:220-223.

Hunt, W. Grainger. 1975. The Chihuahuan Desert peregrine falcon survey, 1975. Prepared for the Office of Nat. Sci., Southwest Region, NPS. Chihuahuan Desert Research Inst. Contrib. No. 9.

_____. 1976. The peregrine falcon population in the Chihuahuan Desert and surrounding mountain ranges: an evaluation through 1976. Chihuahuan Desert Research Inst., Contrib. No. 6.

_____. 1977. The significance of wilderness ecosystems in western Texas and adjacent regions in the ecology of the peregrine. Pp. 604-616 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

_____. 1979a. West Texas peregrines. Texas Parks and Wildl. February. Pp. 24-25.

_____. 1979b. Evaluation of impact of Guadalupe Mountains National Park Trail Project (Phases I & II) on peregrine falcons. Rept. to NPS, Southwest Region, Santa Fe, New Mexico. August.

Johnson, Brenda S. 1976a. Peregrine falcons in West Texas: results of the 1976 nesting survey. Prepared for the Texas Parks and Wilds. Dept. Chihuahuan Desert Research Inst. Contrib. No. 2. 49 pp.

_____. 1976b. Continuing studies of raptors in two national parks in western Texas, 1976. Prepared for the U.S. NPS. Chihuahuan Desert Research Inst. Contrib. No. 12. 31 pp.

Key, L. J. 1980. Peregrine falcon breeding status in Texas national parks, 1980. Chihuahuan Desert Research Inst. Contrib. No. 97. 19 pp.

Kittams, Walter H. 1968. Deer range ecology and cave climate studies at Carlsbad Caverns. Pp. 28-29 in Proc. of the meeting of research scientists and management biologists of the NPS. Horace M. Albright Training Center, Grand Canyon Natl. Park, Arizona. April.

Kittams, Walter H., Stanley L. Evans, and Derrick C. Cooke. 1979. Food habits of mule deer on foothills of Carlsbad Caverns National Park. Pp. 403-426 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Knudson, Edward C. 1990. Moth Checklist for Guadalupe Mountains National Park, Texas. Unpublished report. 13 pp.

Kowaleski, C. D. and V. R. Wade. 1977. Texas peregrine eyrie search, 1977. Pp. 31-42 in Nesting peregrine falcons in Texas, 1977. (W. G. Hunt and B. S. Johnson, eds.). Prepared for the Texas Parks and Wildl. Dept. Chihuahuan Desert Research Inst. Contrib. No. 37.

Krysl, Leslie J. and C. David Simpson. 1980. Food habits of mule deer and elk and their impact on vegetation in Guadalupe Mountains National Park. Final report to CPSU, NPS, Southwest Region, Santa Fe, New Mexico. Jan. 132 pp.

LaVal, Richard K. 1973. Occurrence, ecological distribution, and relative abundance of bats in McKittrick Canyon, Culberson County, Texas. Southwestern Nat. 17:357-364.

Lockhart, J. M. 1976. The food habits, status, and ecology of nesting golden eagles in the Trans-Pecos region of Texas. M.S. thesis. Sul Ross State Univ., Alpine, Texas.

Mecham, John S. 1979. The biogeographical relationships of the amphibians and reptiles of the Guadalupe Mountains. Pp. 169-179 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Metcalf, Artie L. 1979. Some quaternary molluscan faunas from the northern Chihuahuan Desert and their paleoecological implications. Pp. 53-66 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

Miller, Robert Rush. 1977. Composition and derivation of the native fish fauna of the Chihuahuan Desert region. Pp. 365-381 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

Moody, James V. and David E. Foster. 1974. The bionomics of Pogonomyrmex maricopa Wheeler (Hymenoptera: Formicidae) in Guadalupe Mountains National Park. Pp. 20-25 in Transactions of Southwest Region Nat. Sci. Conf., NPS, Santa Fe, New Mexico.

_____. 1979. Notes on the bionomics and nest structure of Pogonomyrmex maricopa (Hymenoptera: Formicidae). Pp. 115-121 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Morrison, Bruce L. 1979. History and status of Barbary sheep in New Mexico. Typescript. 7 pp.

_____. 1980. History and status of Barbary sheep in New Mexico. Pp. 15-16 in Proceedings of the symposium on ecology and management of Barbary sheep (C. David Simpson, ed.). Texas Tech Univ., Lubbock.

Musgrove, Paul N. 1935. A synopsis of the Genus Helichus Erickson in the United States and Canada, with description of a new species. Proc. Entomol. Soc., Washington, 37:137-145.

_____. 1977a. Endangered and threatened fauna and flora, Guadalupe Mountains and Carlsbad Caverns National Parks. Unpubl. list. 1 p.

_____. 1977b. List of restricted animal taxa, Guadalupe Mountains and Carlsbad Caverns National Parks. Unpubl. list. 1 p.

Netherton, W. N., B. S. Johnson, and W. G. Hunt. 1978. An evaluation of essential habitat of nesting peregrine falcons in ... Guadalupe Mountains National Park, Texas. A portfolio prepared for the NPS by the Chihuahuan Desert Research Inst., Alpine, Texas.

Newman, George A. 1971. Guadalupe. Bull. Texas Ornith. Soc. 4:2-6.

_____. 1973. Report on the vertebrates of Pine Spring Canyon tramway Site, Guadalupe Mountains National Park, Texas. Unpubl. rept. by Ecology Audits, Inc. Hardin-Simmons Univ., Abilene, Texas. 10 pp.

_____. 1974a. A report on the breeding bird populations of selected woodlands in Guadalupe Mountains National Park. Pp. 34-42 in Transactions of Southwest Region Nat. Sci. Conf., NPS Santa Fe, New Mexico.

_____. 1974b. Check-list of birds: Guadalupe Mountains National Park.

_____. 1974c. Recent bird records from the Guadalupe Mountains, Texas. Southwestern Nat. 19:1-7.

_____. 1975. Compositional aspects of breeding avifauna in selected woodlands of the southern Guadalupe Mountains, Texas. Ph. D. dissertation. Texas A&M Univ., College Station. 114 pp.

_____. 1977. Breeding bird density and species composition of a shrub-grassland community in Guadalupe Mountains National Park, Texas. Unpubl. rept. to NPS, Southwest Region, Santa Fe, New Mexico. 13 pp.

_____. 1979. Compositional aspects of breeding avifauna in selected woodlands of the southern Guadalupe Mountains, Texas. Pp. 181-237 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

O'Connell, Margaret A. 1979. Coexistence of two species of kangaroo rats (Genus Dipodomys) in the Guadalupe Mountains National Park, Texas. Pp. 349-371 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Ollieu, M. M., W. M. Ciesla, L. E. Drake, and G. N. Mason. 1968. Forest pest detection survey in the mountain forests of west Texas. USDA, Forest Serv. Southeastern Area, S&PF, Div. Forest Pest Control, Pineville, Louisiana. Rept. No. 69-2-25.

Packard, Robert L. and P. V. August. 1977. Report on the small mammal population studies, Guadalupe Mountains National Park, Texas. Pp. 1-24 in Third annual report - biological investigations and information storage and retrieval system, Guadalupe Mountains National Park, Texas. Texas Tech Univ., Lubbock. January.

Phillips, Allan R. 1977. Summary of avian resources of the Chihuahuan Desert region. Pp. 617-620 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

Pilsbry, H. A. and E. P. Cheatum. 1951. Land snails from the Guadalupe range, Texas. The Nautilus 64:87-90.

Prasil, R. G. No date. Bats of the Genus Myotis inhabiting Carlsbad Caverns National Park. Unpubl. rept. 13 pp.

Rocky Mountain/Southwestern Peregrine Falcon Recovery Team, USFWS. 1977. American peregrine falcon recovery plan (Rocky Mountain and Southwest Population). 183 pp.

Schmidly, David J. 1977. Factors governing the distribution of mammals in the Chihuahuan Desert region. Pp. 163-192 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

Scudday, James F. 1977. Some recent changes in the herpetofauna of the northern Chihuahuan Desert. Pp. 513-522 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

Simpson, C. David and Tim J. Leftwich. 1976. Desert bighorn sheep: A feasibility study on their re-introduction to the Guadalupe Mountains. Rept. submitted to NPS. 30 pp.

Simpson, C. David and John D. Moody. 1977a. Ecological impact of large game animals in Guadalupe Mountains National Park. End of year rept. to NPS, Southwest Region, Santa Fe, New Mexico. 3 pp.

_____. 1977b. Ecology and population dynamics of elk in Guadalupe Mountains National Park. End of year rept. to NPS, Southwest Region, Santa Fe, New Mexico. 8 pp.

_____. 1979. The ecology and population dynamics of elk in Guadalupe Mountains National Park. Final rept. #3 to NPS, Southwest Region, Santa Fe, New Mexico. 6 pp.

Simpson, C. David and Leslie J. Krysl. 1978. The ecological impact of large game animals in the Guadalupe Mountains National Park. Final rept. #3 to NPS, Southwest Region, Santa Fe, New Mexico. 4 pp.

Simpson, C. David and Tony G. Dickison. 1980. Food habits of Barbary sheep in the Guadalupe Mountains, New Mexico. Pp. 87-91 in Proceedings of the symposium on ecology and management of Barbary sheep (C. David Simpson, ed.). Texas Tech Univ., Lubbock.

Wauer, Roland H. 1976. The status of peregrine falcons in west Texas. Pp. 2-7 in The status of peregrine falcons in west Texas and some management implications. Nat. Resources Seminar No. 2. NPS, Southwest Region, Santa Fe, New Mexico.

_____. 1978. Status of threatened animals that occur in areas of the Southwest Region, NPS. Unpubl. rept. 65 pp.

Wauer, Roland H. and J. David Ligon. 1977. Distributional relations of breeding avifauna of four southwestern mountain ranges. Pp. 567-568 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

Webb, J. P., P. Robaux, and G. D. Campbell. 1977. Notes on the biology of Centhothrombium cavaticum (Acari: Thrombiidae), a parasite of cave crickets (Rhaphidorphoridae: Centhophilus). Bull. S. Calif. Acad. Sci. 76:135-137.

Welbourn, W. Calvin. 1975. Checklist of the arthropod cave fauna of Carlsbad Caverns National Park. Unpubl. checklist. 4 pp.

_____. 1977. Cave fauna list for Carlsbad Caverns and Guadalupe Mountains National Parks. Unpubl. checklist. 9 pp.

_____. 1978b. Survey of the cave fauna of the Guadalupe escarpment region, New Mexico. P. 37 in CRF 1977 Ann. Rept.

West, Steve. 1972. Birds of Carlsbad Caverns and Guadalupe Mountains National Parks. Unpubl. checklist. 18 pp.

_____. 1979a. Checklist of birds, Carlsbad Caverns National Park, New Mexico. Carlsbad Caverns Nat. Hist. Assoc., Carlsbad, New Mexico.

_____. 1979b. Changes in status of several Eddy County birds. Unpubl. rept. 3 pp.

Whitacre, D. F. 1976. A peregrine falcon nesting survey and habitat evaluation in the Lincoln National Forest, New Mexico, 1976. Prepared for the U.S. Forest Serv. Chihuahuan Desert Research Inst. Contrib. No. 4.

Wilhelm, Dallas E., Jr. 1979. Status of the Guadalupe Mountains vole, Microtus mexicanus guadalupensis. Pp. 395-401 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

FIRE

Ahlstrand, Gary M. 1974. Ecology of fire, Carlsbad Caverns and Guadalupe Mountains National Parks. Pp. 43-45 in Transactions of Southwest Regional Nat. Sci. Conf., NPS, Santa Fe, New Mexico.

_____. 1979a. Preliminary report on the ecology of fire study, Guadalupe Mountains and Carlsbad Caverns National Parks. Pp. 31-44 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

_____. 1979b. Fire history of a relict mixed conifer forest. Paper presented at 2nd Conf. on Sci. Research in the national parks. 12 pp.

_____. 1980. Response of Chihuahuan Desert mountain shrub vegetation to burning. Unpubl. Ms. 14 pp.

_____. 1981a. Ecology of fire in the Guadalupe Mountains and adjacent Chihuahuan Desert. Final report submitted to NPS, Southwest Region, Santa Fe, New Mexico. 168 pp.

_____. 1981b. High country fire history. Pp. 1-34 in Ecology of fire in the Guadalupe Mountains and adjacent Chihuahuan Desert.

_____. 1981c. The effects of fire on some plants native to Guadalupe Mountains and Carlsbad Caverns National Parks. Pp. 35-61 in Ecology of fire in the Guadalupe Mountains and adjacent Chihuahuan Desert.

_____. 1981d. Ecological role of fire in the Guadalupe Mountains region. Pp. 102-125 in Ecology of fire in the Guadalupe Mountains and adjacent Chihuahuan Desert.

_____. 1981e. Prescribed research burn studies in the Guadalupe Mountains. Pp. 145-158 in Ecology of fire in the Guadalupe Mountains and adjacent Chihuahuan Desert.

_____. 1981f. Dendrochronology and response function analysis. Pp. 159-168 in Ecology of fire in the Guadalupe Mountains and adjacent Chihuahuan Desert.

Cline, Paul S. and Gary M. Ahlstrand. 1981. Effects of fire on seed germination for selected shrub species of the Guadalupe Mountains. Pp. 126-144 in Ecology of fire in the Guadalupe Mountains and adjacent Chihuahuan Desert.

Kittams, Walter H. 1972. Effects of fire on vegetation of the Chihuahuan Desert region. Proc. Ann. Tall Timbers Fire Ecology Conf. 12:427-444.

Peacock, George L., Jr. 1981. Flammability-internal water status of shrubs. Pp. 62-101 in Ecology of fire in the Guadalupe Mountains and adjacent Chihuahuan Desert.

Wright, Henry A. and Arthur W. Bailey. 1982. Fire Ecology. United States and Southern Canada. A Wiley-Interscience Publication. New York. 510 p.

Bunting, Steven C. 1978. The vegetation of the Guadalupe Mountains. Ph. D. dissertation. Texas Tech Univ., Lubbock. 183 pp.

Burgess, Tony L. 1979a. Agave - complex of the Guadalupe Mountains National Park: putative hybridization between members of different subgenera. Pp. 79-89 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

_____. 1979b. Summary of investigation of trail construction sites for threatened or endangered plant species for Biological Assessment - Guadalupe Mountains National Park. Rept. to Superintendent, Carlsbad Caverns and Guadalupe Mountains National Parks. 44 pp. 27 July.

Burgess, Tony L. and David K. Northington. 1974. Desert vegetation in the Guadalupe Mountains region. Unpubl. rept. Texas Tech Univ., Lubbock. 21 pp.

_____. 1877. Desert vegetation in the Guadalupe Mountains region. Pp. 229-242 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

_____. 1981. Plants of the Guadalupe Mountains and Carlsbad Caverns National Parks - an annotated checklist. Chihuahuan Desert Research Inst., Contrib. #107. 174 pp.

Correll, Donovan S. and Marshall C. Johnston. 1979. Manual of the Vascular Plants of Texas. The University of Texas at Dallas. 1881 pp.

Davila, Vidal. 1987. Tamarisk Eradication Efforts at Guadalupe Mountains National Park, Texas. Proceedings of Tamarisk Conference, University of Arizona, Tucson, Arizona. September 2-3, 1987. 4 pp.

Gardner, D. E. and B. Little. 1974. Identification and ecology of microflora in caves of the National Park system. Pp. 156-160A in Trans. of Southwest Regional Nat. Sci. Conf., NPS, Santa Fe, New Mexico.

Gehlbach, Frederick R. 1963. The Guadalupe ecosystem: an approach to basic plant ecological research in the National Park Service. Ph. D. dissertation. Univ. Michigan. 170 pp.

Achauer, C. W. 1969. Origin of Capitan Formation, Guadalupe Mountains, New Mexico and Texas. Am. Assoc. Petrol. Geol. Bull. 53:2314-2323.

_____. 1971. Origin of Capitan Formation, Guadalupe Mountains, New Mexico and Texas (Reply). Am. Assoc. Petrol. Geol. Bull. 55-313-315.

Adams, John E. 1935. Upper Permian stratigraphy of west Texas Permian basin. Am. Assoc. Petrol. Geol. Bull. 19:1010-1022.

Adams, John E., M. G. Cheney, Ronald K. DeFord, Robert L. Dickey, Carl O. Dunbar, John M. Hills, Robert E. King, E. Russell Lloyd, A. K. Miller, and C. E. Needham. 1939. Standard Permian section of North America. Am. Assoc. Petrol. Geol. Bull. 23:1673-1781.

Adams, John E. and H. N. Frenzel. 1950. Capitan barrier reef, Texas and New Mexico. J. Geol. 58:289-312.

Babcock, Jack A. 1974. The role of algae in the formation of the Capitan Limestone (Permian, Guadalupian), Guadalupe Mountains, West Texas, New Mexico. Ph.D. dissertation, Univ, Wisconsin, Madison. 241 pp.

_____. 1979. Calcareous algae and algal problematica of the Capitan Reef (Permian), Guadalupe Mountains, West Texas and New Mexico, USA. In Bull. Cent. Rech. Explor. - Prod, pp. 419-428. November.

Ball, S. M., J. W. Roberts, J. A. Norton, and W. D. Pollard. 1971. Queen Formation (Guadalupian, Permian) outcrops of Eddy County, New Mexico, and their bearing on recently proposed depositional models. Am. Assoc. Petrol. Geol. Bull. 55:1348-1355.

Behnken, F. H. 1975a. Leonardian and Guadalupian biostratigraphy in western and southwestern United States. J. Paleontology 49:284-315.

_____. 1975b. Conodonts as biostratigraphic indices. Pp. 84-90 in Permian exploration, boundaries, and stratigraphy (J. M. Cys and D. F. Toomey, eds.). West Texas Geol. Soc. and Permian Basin Soc., Soc. Econ. Paleontologists and Mineralogists.

Blanchard, W. G., Jr. and J. M. Davis. 1929. Permian stratigraphy and structure of parts of southeastern New Mexico and southwestern Texas. Am. Assoc. Petrol. Geol. Bull. 13:957-995.

Boyd, D. W. 1958. Permian sedimentary facies, central Guadalupe Mountains, New Mexico. New Mexico Bu. Mines and Mineral Resources Bull. 49. 100 pp.

Brand, John P. and Alonzo D. Jacka. 1979. Geology of the Guadalupe Mountains. Pp. 1-11 in Biological investigations in the Guadalupe Mountains National Park. Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Ser. No. 4.

Cartwright, L. D., Jr. 1930. Transverse section of Permian basin, west Texas and southeast New Mexico. Am. Assoc. Petrol. Geol. Bull. 14:969-981.

Cave, H. S. 1954. The Capitan - Castile - Delaware Mountain problem. Pp. 117-124 in New Mexico Geol. Soc. Guidebook, Fifth Field Conf.

Choquette, P. W. and L. C. Pray. 1970. Geologic nomenclature and classification of porosity in sedimentary carbonates. Am. Assoc. Petrol. Geol. Bull. 54:207-250.

Crandall, K. H. 1929. Permian stratigraphy of southeastern New Mexico and adjacent parts of western Texas. Am. Assoc. Petrol. Geol. Bull. 13:927-944.

Cys, J. M. 1971. Discussion: Origin of Capitan Formation, Guadalupe Mountains, New Mexico and Texas. Am. Assoc. Petrol. Geol. Bull. 55:310-312.

_____. 1975. New observations on the stratigraphy of key Permian sections of west Texas. Pp. 22-42 in Permian exploration, boundaries, and stratigraphy (J. M. Cys and D. F. Toomey, eds.). West Texas Geol. Soc. and Permian Basin Sec., Soc. Econ. Paleontologists and Mineralogists.

Darton, N. H. and P. B. King. 1932. Western Texas and Carlsbad Caverns. XVI Internat. Geol. Cong. Guidebook 13--Excursion C-1. USGS, Washington, D. C. 38 pp.

Darton, N. H. and J. B. Reeside, Jr. 1926. Guadalupe Group. Geol. Soc. Am. Bull. 37:413-428.

DeFord, R. K. and G. D. Riggs. 1941. Tansill Formation, west Texas and southeastern New Mexico. Am. Assoc. Petrol. Geol. Bull. 25:1713-1728.

DuChene, Harvey R. 1978. Geologic history of the Guadalupe Mountains region. NSS Bull. 40:3-6.

Dunham, Robert J. 1962. Field trip guidebook, reinterpretation of sedimentation and diagenesis of the Permian Capitan Reef and associated rocks, New Mexico and Texas. Shell Development Company, Spec. Rep. 4.

_____. 1969a. Vadose pisolite in the Capitan Reef (Permian), New Mexico and Texas. Pp. 182-191 in Depositional environments in carbonate rocks, a symposium (Gerald M. Friedman, ed.). Soc. Econ Paleontologists and Mineralogists. Spec. Publ. No. 14.

_____. 1969b. Asymmetrically-filled veins in Capitan Reef and their genetic similarity to vadose pisolite, New Mexico and Texas (abs.). Geol. Soc. Am. Spec. Paper 121, pp. 83-84.

_____. 1970. Stratigraphic reefs versus ecologic reefs. Am. Assoc. Petrol. Geol. Bull. 54:1931-1932.

_____. 1972. Capitan Reef, New Mexico and Texas: Facts and questions to aid interpretation and group discussion. Permian Basin Sec., Soc. Econ. Paleontologists and Mineralogists, Publ. 72-14. 294 pp.

Franseen, Evan K. 1985. Sedimentology of the Grayburg and Queen Formation and the Shelf Margin Erosion Surface, Western Escarpment, Guadalupe Mountains-West Texas. University of Wisconsin-Madison. 300 pp.

Frenzel, H. N. 1962. The Queen - Grayburg - San Andres problem solved. Pp. 87-90 in 1962 Guidebook, Permian of the central Guadalupe Mountains, Eddy County, New Mexico (J. B. Zimmerman, guidebook chm.). West Texas, Roswell, and Hobbs Geol. Soc. Guidebook, Publ. No. 62-48.

Furnish, W. M. and B. F. Glenister. 1969. The Guadalupian Series (abs.). Geol. Soc. Am. Spec. Paper 121. Pp. 105-106.

Girty, G. H. 1902. The Upper Permian in western Texas. Am. J. Sci. 14:363-368.

_____. 1909. The Guadalupian fauna and new stratigraphic evidence. New York Acad. Sci. Ann. 19-137-138.

Goolsby, James. 1974. Geologic mapping and site evaluation of the Guadalupe Mountains National Park. Pp. 26-27 in Transactions of Southwest Regional Nat. Sci. Conf., NPS, Santa Fe, New Mexico.

Goolsby, James and C. C. Reeves, Jr. 1975. Geologic mapping and site evaluation of the Guadalupe Mountains National Park. Pp. 1-20 in Studies in vascular plants, mammals survey and data analysis, Guadalupe Mountains National Park, Texas. January 1975.

Grauten, W. F. 1965. Fluid relationships in Delaware Mountain sandstone. Pp. 294-307 in Fluids in subsurface environments. Am. Assoc. Petrol. Geol. Mem. 4.

Hall, W. E. 1960. Upper Permian correlations in southeastern New Mexico and adjacent parts of west Texas. Pp. 85-88 in Geology of the Delaware basin and field trip guidebook. West Texas Geol. Soc. Guidebook.

Harms, J. C. 1974. Brushy Canyon Formation, Texas: a deep-water density current deposit. Geol. Soc. Am. Bull. 85:1763-1784.

Hart, William G. 1969. Microfacies analysis of the Permian reef complex (Guadalupian), Carlsbad Caverns, New Mexico. MS thesis, Texas Technol. College. 88 pp.

Hayes, P.T. and R.L. Koogle. 1964. Geology of the Guadalupe Mountains, New Mexico. U. S. Geol. Survey prof. Paper 446. 69 pp.

Hayes, P. T. and R. L. Koogle. 1958. Geology of the Carlsbad Caverns West Quadrangle, New Mexico - Texas. U. S. Geol. Survey Geol. Quad Map GQ-112.

Hileman, Mary E. and S. J. Mazzullo (eds.). 1977. Upper Guadalupian facies, Permian reef complex, Guadalupe Mountains, New Mexico and West Texas. 1977 Field Conf. Guidebook, Permian Basin Sec., Soc. Econ. Paleontologists and Mineralogists, Publ. 77-16. 508 pp.

Hill, Carol A. 1987. Geology of Carlsbad Caverns and other caves in the Guadalupe Mountains, New Mexico and Texas. New Mexico Institute of Mining and Technology. 150 pp.

Hills, J. M. 1972. Late Paleozoic sedimentation in west Texas Permian basin. Am. Assoc. Petrol. Geol. Bull. 56:2303-2322.

Hornberg, Leland. 1949. Geomorphic history of the Carlsbad Caverns area, New Mexico. J. Geol. 57:464-478.

Hull, Joseph P. D., Jr. 1957. Petrogenesis of Permian Delaware Mountain sandstone, Texas and New Mexico. Bull. Am. Assoc. Petrol. Geol. 41:278-307.

Jacka, A. D. 1974. Replacement of fossils by length-slow chalcedony and associated dolomitization. J. Sed. Petrol. 44:421-427.

Jacka, A. D., R. H. Beck, L. C. St. Germain, and S. C. Harrison. 1968. Permian deep-sea fans of the Delaware Mountain Group (Guadalupian), Delaware basin. Pp. 49-90 in Guadalupian facies, Apache Mountains area, west Texas. Permian Basin Sec., Soc. Econ. Paleontologists and Mineralogists.

Jacka, A. D., C. M. Thomas, R. H. Beck, K. W. Williams, and S. C. Harrison. 1972. Guadalupian depositional cycles, Delaware basin and Northwest shelf. Pp. 151-195 in Cyclic sedimentation in the Permian basin (second edition, J. G. Elam and S. Chuber, eds.). West Texas Geol. Soc.

Jenkins, R. E. 1961. Characteristics of the Delaware Formation. J. Petrol. Technol. 13:1230-1236.

Johnson, J. H. 1942. Permian line-secreting algae from the Guadalupe Mountains, New Mexico. Geol. Soc. Am. Bull. 53:195-226.

Kelley, Vincent C. 1971. Geology of the Pecos Country, Southeastern New Mexico. State Bu. Mines and Mineral Resources, New Mexico Inst. of Mining and Technol., Socorro, Mem. 24. 75 pp.

_____. 1972. Geometry and correlation along Permian Capitan escarpment, New Mexico and Texas. Am. Assoc. Petrol. Geol. Bull. 57:2192-2211.

Kendall, C. G. St. C. 1969. An environmental re-interpretation of the Permian evaporite/carbonate shelf sediments of the Guadalupe Mountains. Geol. Soc. Am. Bull. 80:2503-2525.

Kerr, S. D. and A. Thompson. 1963. Origin of nodular and bedded anhydrite in Permian shelf sediments, Texas and New Mexico. Am. Assoc. Petrol. Geol. Bull. 47:1726-1732.

Keyes, C. R. 1929. Guadalupian reef theory. Pan-Am. Geol. 52:41-60.

_____. 1933. Capitan Limestone as great barrier reef (abs.). Pan-Am. Geol. 60:306.

_____. 1936. Guadalupian Series: its span and affinities. Pan-Am. Geol. 65:35-36.

_____. 1938a. Guadalupian fauna; what it is not. Pan-Am. Geol. 69:139-144.

_____. 1938b. Guadalupian Series in taxonomic status. Pan-Am. Geol. 69:237-240.

King, P. B. 1934. Permian stratigraphy of Trans-Pecos Texas. Geol. Soc. Am. Bull. 45:697-798.

_____. 1942. Permian of west Texas and southeastern New Mexico. Am. Assoc. Petrol. Geol. Bull. 26:535-763.

_____. 1948. Geology of the southern Guadalupe Mountains, Texas. U. S. Geol. Survey Prof. Paper No. 215. 183 pp.

_____. 1967. Reef and associated deposits in the Permian of west Texas. Pp. 36-44 in Paleotectonic maps of the Permian System (E. D. McKee, et al.). U. S. Geol. Survey Misc. Geol. Inv. Map I-450 (with text).

King, P. B. and N. D. Newell. 1956. McCombs Limestone Member of Bell Canyon Formation, Guadalupe Mountains, Texas. Am. Assoc. Petrol. Geol. Bull. 40:386-387.

Klement, K. W. 1968. Studies on the ecological distribution of lime-secreting and sediment-trapping algae in reefs and associated environments. Neues Jahrb, Geologie U. Palaontologie Abh. 125:363-381.

Land, W. T. B. 1937. The Permian formations of the Pecos valley of New Mexico and Texas. Am. Assoc. Petrol. Geol. Bull. 21:833-898.

Motts, Ward S. 1962. Geology of the West Carlsbad Quadrangle, New Mexico. U. S. Geol. Survey Geol. Quad. Map GQ-167.

_____. 1968. The control of ground-water occurrence by lithofacies in the Guadalupian reef complex near Carlsbad, New Mexico. Geol. Soc. Am. Bull. 79:283-297.

_____. 1972. Geology and paleoenvironments of the northern segment, Capitan shelf, New Mexico and west Texas. Geol. Soc. Am. Bull. 83:701-722.

_____. 1973. Structure, sedimentation and paleoenvironments of northern Capitan reef complex, New Mexico and west Texas (abs.). Am. Assoc. Petrol. Geol. Bull. 57:796.

Nesse, Douglas G. 1979. Facies Mosaic of the Upper Yates and Lower Tansill Formations (Upper Permian), Walnut Canyon, Guadalupe Mountains, New Mexico, MS thesis, Univ. Wisconsin, Madison. 123 pp.

New, Michael E. 1988. Sedimentology of the Cherry Canyon Tongue (Cherry Canyon Formation) Western Guadalupe Mountains, Texas and New Mexico. University of Wisconsin-Madison. 350 pp.

Newell, N. D. 1955. Depositional fabric in Permian reef limestones. J. Geol. 63:301-309.

Newell, N. D., J. K. Rigby, A. G. Fischer, A. J. Whiteman, J. E. Hickox, and J. S. Bradley. 1953. The Permian reef complex of the Guadalupe Mountains region, Texas and New Mexico. San Francisco, W. H. Freemand and Company. 236 pp.

Ormiston, Allen and Laurel Babcock. 1979. Gollicuculus, New Radiolarian Genus from the Guadalupian (Permian) Lamar Limestone of the Delaware Basin. In J. Paleontol., 53:328-334. March.

Payne, M. W. 1976. Basinal sandstone facies, Delaware basin, west Texas and southeast New Mexico. Am. Assoc. Petrol. Geol. Bull. 60:517-527.

Pratt, Wallace E. 1958. Geological data, Guadalupe Mountain Ranch. Typewritten letter, January 11, 1958. 4 pp.

Pray, Lloyd E. 1971. Submarine slope erosion along the Permian bank margin, west Texas. Abs. of paper to be presented at 1971 AAPG-SEPM meeting, Houston. 1 p.

Pray, Lloyd C. and Mateu Esteban (eds.). 1977. Upper Guadalupian facies, Permian reef complex, Guadalupe Mountains, New Mexico and West Texas. 1977 Field Conf. Guidebook, vol. 1, road logs and locality guides. Permian Basin Sec., Soc. Econ. Paleontologists and Mineralogists, Publ. 77-16. 194 pp.

Railsback, Richard R. and C. C. Reese, Jr. 1976. Geologic hazards in the Pine Springs Canyon area of the Guadalupe Mountains National Park, Texas. Ann. report to NPS, Southwest Region. Texas Tech Press, Lubbock. 75 pp.

Rossen, Christine. 1985. Sedimentology of the Brushy Canyon Formation (Permian, Early Guadalupian) in the Onlap Area, Guadalupe Mountains, West Texas. University of Wisconsin-Madison. 340 pp.

Roswell Geologic Society. 1951. Guidebook, field trip No. 4, Permian stratigraphy of the Capitan reef area of the southern Guadalupe Mountains, New Mexico. 23 pp. (mimeo).

_____. 1957. Field trip No. 10, Slaughter Canyon, New Cave, and Capitan reef exposures, Carlsbad Caverns National Park. 19 pp. (mimeo).

Schmidt, V. and K. W. Klement. 1971. Early diagenetic origin of reef framework in the Permian Capitan reef complex, Guadalupe Mountains, Texas and New Mexico. Eighth Int. LAS Sedimentological Congr. Program, p. 39.

Scholle, P. A. and D. J. Kinsman. 1974. Aragonitic and high-Mg calcite caliche from the Persian Gulf - a modern analog for the Permian of Texas and New Mexico. J. Sedimentary Petrol. 44:904-916.

Scholle, Peter A. and Robert B. Halley. 1980. Upper Paleozoic depositional and diagenetic facies in a mature petroleum province (A Field Guide to the Guadalupe and Sacramento Mountains). U. S. Geol. Survey, Branch of Oil and Gas Resources, Admin. Rept. 191 pp.

Schwartz, Arthur H. 1981. Facies mosiac of the Upper Yates and Lower Tansill formations (Upper Permian), Rattlesnake Canyon, Guadalupe Mountains, New Mexico. MS thesis, Univ. Wisconsin, Madison. 155 pp.

Schumard, G. G. 1858. Observations on the geological formations of the country between Rio Pecos and Rio Grande in New Mexico near the line of the 32nd parallel. St. Louis Acad. Sci. Trans. 1:273-289.

Schumard, George G. 1886. A partial report on the geology of western Texas. State Print. Office, Austin, Texas. Pp. 77-97.

Silver, B. A. and R. G. Todd. 1969. Permian cyclic strata, northern Midland and Delaware basins, west Texas and southeastern New Mexico. Am. Assoc. Petro. Geol. Bull. 53:2223-2251.

Skinner, J. W. 1946. Correlation of Permian of west Texas and southeast New Mexico. Am. Assoc. Petro. Geol. Bull. 30:1858-1874.

Smith, D. B. 1973. Geometry and correlation along Permian Capitan escarpment: Discussion. Am. Assoc. Petro. Geol. Bull. 57:940-945.

_____. 1974a. Origin of tepees in Upper Permian shelf carbonate rocks of Guadalupe Mountains, New Mexico. Am. Assoc. Petrol. Geol. Bull. 58:63-67.

_____. 1974b. Sedimentation of upper Artesia (Guadalupian) cyclic shelf deposits of northern Guadalupe Mountains, New Mexico. Am. Assoc. Petrol. Geol. Bull. 58:1699-1730.

Snider, H. I. 1966. Stratigraphy and associated tectonics of the Upper Permian Castille - Salado - Rustler evaporite complex Delaware basin, west Texas and southeast New Mexico. Ph. D. dissertation, Univ. New Mexico, Albuquerque. 140 pp.

Society of Economic Paleontologists and Mineralogists. 1958. Field trip guidebook. Permian Basin Sec.

Tarr, R. S. 1892. Reconnaissance in the Guadalupe Mountains. Pp. 3-42 in Texas Geol. Survey Bull. 3.

Thomas, C. M. 1968. Vadose pisolites in the Guadalupe and Apache Mountains, west Texas. Pp. 32-35 in Guadalupian facies, Apache Mountains area, west Texas. Permian Basin Sec., Soc. Econ. Paleontologists and Mineralogists.

Tyrrell, Willis, W., Jr. 1962. Petrology and stratigraphy of near-reef Tansill - Lamar strata, Guadalupe Mountains, Texas and New Mexico. Pp. 58-76 in West Texas, Roswell, and Hobbs Geol. Soc. 1962 Guidebook: Permian of the Central Guadalupe Mountains.

_____. 1964. Paleontology and stratigraphy of near-reef Tansill - Lamar strata, Guadalupe Mountains, Texas and New Mexico. Pp. 66-82 in Geology of the Capitan reef complex of the Guadalupe Mountains, Culberson County, Texas and Eddy County, New Mexico. Roswell Geol. Soc. Guidebook.

_____. 1969. Criteria useful in interpreting environments of unlike but time-equivalent carbonate units (Tansill - Capitan - Lamar), Capitan reef complex, west Texas and New Mexico. Pp. 80-97 in Depositional environments in carbonate rocks (R. M. Friedman, ed.). Soc, Econ. Paleontologists and Mineralogists Spec. Publ. 14.

USDA, SCS (Baker, Audrey F., Hubert L. Jaco, Kelly Black, and Jerry L. Rives) in cooperation with High Point Soil and Water Conservation District. No date. Soils of Guadalupe Mountains National Park. Unpubl. rept. 20 pp.

West Texas Geological Society. 1949. Guidebook, field trip No. 4, The Permian rocks of the Trans-Pecos region. Newsphoto Publishing Co., San Angelo, Texas. 94 pp.

_____. 1960. Geology of the Delaware Basin and field trip guidebook. Midland, Texas. 97 pp.

_____. 1968. West Texas Geological Society Guidebook, Guadalupe Mountains, Hueco Mountains, Franklin Mountains, Geology of Carlsbad Caverns, Delaware Basin Exploration. Midland, Texas. 170 pp.

_____. 1969. West Texas Geological Society Guidebook, Guadalupe Mountains, Hueco Mountains, Franklin Mountains, Geology of the Carlsbad Caverns, Delaware Basin Exploration (1969 Supplement). Midland, Texas. 24 pp.

Wilde, G. L. 1971. Fusulinacean history and its bearing upon Permian boundary problems (abs.). Bull. Can. Petrol. Geol. 19:375-376.

_____. 1975. Fusulinid-defined Permian stages. Pp. 67-83 in Permian exploration, boundaries, and stratigraphy (J. M. Cys and D. F. Toomey, eds.). West Texas Geol. Soc. and Permian Basin Sec., Soc. Econ. Paleontologists and Mineralogists.

Willis, R. 1929. Preliminary correlation of the Texas and New Mexico Permian. Am. Assoc. Petrol. Geol. Bull. 13:997-1031.

Yurewicz, Donald A. 1976. Sedimentology, paleoecology, and diagenesis of the massive facies of the Lower and Middle Capitan Limestone (Permian), Guadalupe Mountains, New Mexico and West Texas. Ph. D. dissertation, Univ. Wisconsin, Madison. 278 pp.

Zimmerman, James B. (guidebook chm.). 1962. Permian of the central Guadalupe Mountains, Eddy County, New Mexico. Compiled by 1962 Field Trip Committee, Hobbs, Roswell, and West Texas Geol. Soc. Publ. 62-48. 115 pp.

HISTORY

Barbee, Robert D. 1967. The Pinery: A Butterfield Stage Station. Unpubl. rept. 19 pp.

Bartlett, John R. 1854. Personal narrative of exploration and incidents in Texas, New Mexico, California, Sonora, and Chihuahua, connected with the United States and Mexican Boundary Commission, during the years 1850, 1851, 1852, and 1853. Vol. 1. D. Appleton and Co., New York.

Basehart, Harry. 1960. Mescalero Apache subsidence patterns and socio-political organizations, Section I. A rept. of the Mescalero-Chiricahua Land Claims Project. Univ. New Mexico, Albuquerque.

_____. 1971. Mescalero Apache band organization and leadership. Pp. 35-50 in Apachean culture history and ethnology (Keith H. Basso and Morris E. Opler, eds.). The Univ. Arizona Anthropol. Paper No. 21.

Battle, David G. 1973. The Pinery. Guadalupe Mountains National Park, Historic Structure Report. NPS, Southwest Regional Office, Div. Hist., Santa Fe, New Mexico. 44 pp.

Bender, A. B. 1933. Opening routes across west Texas, 1848-1850. Southwestern Hist. Quar. 37:116-135.

_____. 1934. The Texas Frontier, 1848-1861 II. Southwestern Hist. Quar. 38:1-26.

Biggers, Barbara. 1979. An ethnohistorical study of the Mescalero Apache in the Guadalupe Mountains. Unpubl. Ms. (typewritten). 17 pp.

Castetter, E. F. and M. R. Opler. 1936. The ethnobiology of the Chiricahua and Mescalero Apache. Univ. New Mexico Biol. Bull. 4:3-63.

Cheatham, Edgar and Patricia Cheatham. 1971. The extraordinary world of Wallace E. Pratt. Petroleum Today 12:1-5.

Crisman, Bobby L. 1976. Notes from interview with Laurie Kincaid. Typed notes. 3 pp.

Collins, Gladys. 1931. Spanish west Texas. Pp. 95-114 in West Texas Hist. Assoc. Year Book. Vol. 7.

Conkling, Roscoe P. No date. The Butterfield overland mail and some of the obstacles faced in the establishment. Unpubl. rept. 11 pp.

_____. No date. Notes on the history of "Pinery", the Butterfield overland mail section at Pine Springs on the summit of Guadalupe Pass, Culberson County, Texas.

Conkling, Roscoe P. and Margaret B. Conkling. 1947. The Butterfield overland mail 1857-1869. 3 vols. Arthur H. Clark Co., Glendale, Calif.

Copithorne, W. L. 1971. The worlds of Wallace Pratt. The Lamp 53:10-15.

Crane, R. C. 1936. The claims of west Texas to recognition by historians. Pp. 11-13 in West Texas Hist. Assoc. Year Book. Vol. 12.

Cushing, H. B. and others. 1870. Cushing report and related correspondence. Unpubl. rept.

Fabry, Judith K. 1988. Guadalupe Mountains National Park: An Administrative History. Southwest Cultural Resources Center, Professional Paper No. 19. Santa Fe, New Mexico.

Griggs, William C. 1973. Interview with Wallace Pratt. Unpubl. rept. Texas Tech Univ., Lubbock. 34 pp.

Heying, Robert. 1972. Southeastern New Mexico Historical Society field trip to old home sites on Washington Ranch, Rattlesnake Springs, Upper Black River. Unpubl. rept. 17 pp.

Kitchen, James W. and William C. Griggs. 1973. A survey of historic structures, Guadalupe Mountains National Park, Texas. Unpubl. rept. Texas Tech Univ., Lubbock.

Lang, Walter B. (ed.). 1940. The Overland Mail: Butterfield Trail.

Levy, Benjamin. 1971. Guadalupe Mountains National Park historic resource study. NPS rept., Div. Hist. Office of Archeol. and Hist. Preservation, Washington, D. C. 148 pp.

Martin, Mabelle E. (ed.). 1926. From Texas to California in 1849: diary of C. C. Cox (concluded). Southwestern Hist. Quar. 29:216-218.

Myers, Lee. No date. A short history of the Signal Peak-Pine Springs area. Unpubl. rept. 9 pp.

Neighbors, Kenneth F. 1954. The expedition of Major Robert S. Neighbors to El Paso in 1849. Southwestern Hist. Quar. 58:54-55.

_____. 1957. The report of the expedition of Major Robert S. Neighbors to El Paso in 1849. Southwestern Hist. Quar. 60:530.

No author. 1976(?). History of road access to Upper Dog Canyon, Guadalupe Mountains National Park. Unpubl. rept. 3 pp.

Opler, M. R. and C. H. Opler. 1950. Mescalero Apache history in the Southwest. New Mexico Hist. Rev. 25:1-36.

Ormsby, Waterman L. 1954. The Butterfield overland mail. The Huntington Library, San Marino, Calif.

Pratt, Wallace E. 1974. Memorandum for Mr. Donald A. Dayton, Superintendent, Carlsbad Caverns and Guadalupe Mountains National Parks on historic structures in Guadalupe Mountains National Park, June 13. Unpubl. memo. 4 pp.

Reeve, Frank D. 1946. The Apache Indians in Texas. Southwestern Hist. Quar. 50:210-211.

Richardson, G. B. 1904. Report of a reconnaissance in Trans-Pecos Texas north of the Texas and Pacific Railway. Univ. Texas Bull. 23. 119 pp.

Schroeder, Albert H. 1960. A study of the Apache Indians, Part III: The Mescalero. Unpubl. rept. submitted to the U. S. Dept. Justice, Santa Fe, New Mexico.

_____. 1973. The Mescalero Apaches. In Tech. Manual: Human Systems Research. Human Systems Research.

Schroeder, Albert H. and Dan S. Matson. 1965. A colony on the move, Gaspar Castano de Sor's Journal 1590-1591. School, Am. Research, Santa Fe, New Mexico.

Scott, Jane. 1978. Guadalupe Mountains National Park overview of historical research: annotated bibliography and recommendation for future studies. Unpubl. rept. for NPS, Santa Fe, New Mexico. 24 pp.

Sonnichsen, C. D. 1958. The Mescalero Apaches. Univ Oklahoma Press, Norman. 303 pp.

Thomas, Alfred B. 1959. The Mescalero Apache 1653-1874. A report of the Mescalero-Chiricahua Land Claims Project. Contract Research #290-154. Univ. New Mexico Library, Albuquerque.

Ward, Charles F. 1932. The Salt War of San Elizario. M.A. thesis. Univ. Texas, Austin.

Williams, J. W. 1957. The Butterfield overland mail road across Texas. Southwestern Hist. Quar. 61:14-18.

Wilson, John F. 1969. Lt. H. B. Cushing: Indian fighter extraordinary. El Palacio 76:40-46.

HYDROLOGY AND AQUATIC SYSTEMS

Beaty, Harold. 1971. Preservation of the microclimate and a plan for visitor management for Smith Springs. Pp. 15-17 in A limnological analysis of McKittrick Creek and springs, Guadalupe Mountains National Park, Texas (Owen T. Lind, author).

Brothers, Gene L. and Ernest B. Fish. 1980. Water quality analysis in Guadalupe Mountains National Park, Texas. Final report to NPS, Southwest Region, Santa Fe, New Mexico. Texas Tech Univ., Lubbock. 28 pp.

Caldwell, Douglas E. 1981. Limnological survey of cavern pools. Final report to NPS, Southwest Region, Santa Fe, New Mexico. December. 40 pp.

Dasher, Douglas H. 1980. Water quality in Guadalupe Mountains National Park. M.S. theses, Texas Tech Univ., Lubbock. 94 pp.

Dick, Michael. 1975. Water quality analysis of six springs in Guadalupe Mountains National Park. Texas Water Quality Board, Dist. 4. 28 pp.

Fish, Ernest B. 1974. Summary of watershed and land system classification studies in Guadalupe Mountains National Park during 1974. Pp. 28-33 in Transactions of Southwest Regional Nat. Sci. Conf., NPS, Santa Fe, New Mexico.

_____. 1975. Watershed and land system classification studies in Guadalupe Mountains National Park, Texas. Unpubl. report to NPS, Southwest Region, Santa Fe, New Mexico. 35 pp.

Fish, Ernest B., V. B. Ackerson, and P. S. Fuller. 1977. Watershed inventory and land classification studies in Guadalupe Mountains National Park, Texas. Unpubl. report to NPS, Southwest Region, Santa Fe, New Mexico. 109 pp.

Fish, E. B. and M. J. Dvoracek. 1980. Watershed impacts of recreational development in the Guadalupe Mountains National Park, Texas. Report to the Office of Water Resources and Tech. 479 pp.

Fuller, Paul A. 1976. Delineation and analysis of the landforms and watersheds of Guadalupe Mountains National Park, Texas. M.S. thesis, Texas Tech Univ., Lubbock. 140 pp.

Fuller, Paul A. and E. B. Fish. 1977. Watershed inventory studies of Guadalupe Mountains National Park, Texas. Ms. for publ.

Kalley, John Stanley. 1979. Assessment of water resources of Guadalupe Mountains National Park, Texas. M.S. thesis, Texas Tech Univ., Lubbock. 116 pp.

Leggatt, E. R. 1969. Preliminary report of the water resources of the Guadalupe Mountains National Park. U. S. Geol. Survey Open File Report. 37 pp.

Lind, Owen T. 1969. Limnological analysis of McKittrick Creek, Guadalupe Mountains National Park. Unpubl. rept. to NPS. 16 pp.

_____. 1971. A limnological analysis of McKittrick Creek and springs, Guadalupe Mountains National Park, Texas. A second (unpubl.) project rept. 17 pp.

_____. 1979. Limnology of McKittrick Creek, Guadalupe Mountains National Park. Pp. 123-139 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

U.S. Department of Interior. 1990. Spring and Seep Inventory. National Park Service. Unpublished report. 100 pp.

LEGISLATION

The Antiquities Act of 1906, June 8, 1906 (PL 59-109; 34 STAT. 225; 16 USC 431-433).

Executive Order 1991, appointment of rangers as State fish or game wardens, July 9, 1914.

The National Park Service Organic Act of 1916, August 25, 1916 (PL 64-235; 39 STAT. 535).

Act of September 22, 1922 for protection of timber (42 STAT. 857).

Proclamation 1679 establishing Carlsbad Cave National Monument, October 25, 1923 (43 STAT. 1929).

Executive Order 3984, boundary adjustment for Carlsbad Cave National Monument, April 2, 1924.

Act of April 9, 1924 authorizing park roads and trails (43 STAT. 90); amended January 31, 1931 (46 STAT. 1053).

Supplemental Executive Order 4870, boundary adjustment for Carlsbad Cave National Monument, May 3, 1928.

Act of May 14, 1930 to establish Carlsbad Caverns National Park (46 STAT. 279).

Executive Order 5370, boundary adjustment for Carlsbad Caverns National Park, June 17, 1930.

Proclamation 2031, boundary adjustment for Carlsbad Caverns National Park, February 21, 1933 (47 STAT. 2556).

Executive Order 6166, reorganization, June 10, 1933.

The Fish and Wildlife Coordination Act, March 10, 1934 (48 STAT. 401); amended August 14, 1946 (60 STAT. 1080); amended August 12, 1958 (PL 85-624; 72 STAT. 563).

Act of May 4, 1934 to authorize exchange of certain Government for private land at Carlsbad Caverns National Park (48 STAT. 664).

The Historic Sites Act of 1935 (PL 74-292; 49 STAT. 666; 16 USC 461-467).

Proclamation 2321, boundary adjustment for Carlsbad Caverns National Park, February 3, 1939 (53 STAT. 2523).

The National Trust Act of 1949 (63 STAT. 927).

Act of March 19, 1950 concerning airports in or near parks (64 STAT. 27); amended November 5, 1966 (80 STAT. 1313).

Act of June 14, 1950 to commemorate Jim White (64 STAT. 211).

Act of August 8, 1953 to facilitate management of the National Park Service (PL 83-230; 67 STAT. 495).

Act of August 31, 1954, acquisition of non-Federal lands (68 STAT. 1037); amended August 6, 1956 (70 STAT. 1066).

Act of May 27, 1955 authorizing interagency agreements (69 STAT. 66).

The Reservoir Salvage Act of 1960 (PL 86-523; 74 STAT. 220; 16 USC 469-469c); amended May 24, 1974 (PL 93-291; 88 STAT. 174).

Act of October 23, 1962 authorizing easements (76 STAT. 1129).

Joint Resolution to provide protections for the golden eagle, October 24, 1962 (76 STAT. 1246).

Act of May 28, 1963 to promote outdoor recreation (77 STAT. 49).

The Clean Air Act of December 17, 1963 (PL 88-206); amended October 20, 1965 (Motor Vehicle Air Pollution Control Act, PL 89-272); amended October 15, 1966 (PL 89-675); amended November 21, 1967 (Air Quality Control Act, PL 90-148); amended December 31, 1970 (PL 91-604); amended November 18, 1971 (Comprehensive Health Manpower Training Act, Pl 92-157); amended June 22, 1974 (Energy Supply and Environmental Coordination Act, PL 93-319); amended August 7, 1977 (PL 95-95); amended November 16. 1977 (Safe Drinking Water Act, PL 95-190).

The Act of December 30, 1963 to revise Carlsbad Caverns National Park boundaries (PL 88-249).

The Wilderness Act of September 3, 1964 (PL 88-577, 78 STAT. 890).

The Land and Water Conservation Fund Act of 1965, September 3, 1964 (PL 88-578; 78 STAT. 847); amended January 1, 1965 (PL 89-72); amended July 15, 1968 (PL 90-401); amended July 7, 1970 (PL 91-308; 84 STAT. 1084); amended July 11, 1972 (86 STAT. 459); amended September 28, 1976 (PL 94-422).

The Water Resources Planning Act of July 22, 1965 (PL 89-80; STAT. 915; 16 USC 470); amended May 9, 1970 (PL 91-243; 84 STAT. 204); amended September 28, 1976 (PL 94-422).

Act of October 15, 1966 to establish Guadalupe Mountains National Park (PL 89-667).

The Department of Transportation Act, October 15, 1966 (PL 89-670; 80 STAT. 930) amended.

Act of October 1966 to authorize research contracts (80 STAT. 951).

The Wild and Scenic Rivers Act, October 2, 1968 (PL 90-541; 82 STAT. 906).

The National Environmental Policy Act of 1969, January 1, 1970 (PL 91-190; 31 STAT. 852; 42 USC 4321-4347).

The Airport and Airway Development Act of May 21, 1970 (PL 91-258).

Act of August 18, 1970 to clarify authorities (PL 91-383; 84 STAT. 825); amended October 7, 1976 (PL 94-458; 90 STAT. 1939).

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, January 2, 1971 (PL 91-646).

Executive Order 11593, Protection and enhancement of the cultural environment. May 3, 1971.

Act of August 4, 1972 to facilitate preservation of historic monuments. (86 STAT. 503).

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500).

Executive Order 11643, Environmental safeguards on activities for animal damage control on Federal land, February 9, 1972.

Executive Order 11644, Use of off-road vehicles on public lands, February 9, 1972.

Office of Management and Budget, Circular A-95, 1973.

Executive Order 11752, Prevention, control, and abatement of environmental pollution at facilities, 1973.

Endangered Species Act of 1973, December 28, 1973 (PL 93-205; 84 STAT. 884); amended November 10, 1978.

The Safe Drinking Water Act of December 16, 1974; amended November 14, 1977 (PL 95-190).

Act of December 23, 1975 authorizing exchange of lands for entrance road, Guadalupe Mountains National Park (PL 94-174; 89 STAT. 1029).

Act of September 28, 1976 concerning mining in NPS area (PL 94-429).

Tax Reform Act of 1976 (PL 94-455; 90 STAT. 1976).

Executive Order 11988, Floodplain management, May 24, 1977.

Executive Order 11990, Protection of wetlands, May 24, 1977.

National Parks and Recreation Act of 1978, November 10, 1978 (PL 95-625).

Archeological Resources Protection Act of 1979.

Federal Cave Resource Act of 1989 (PL100-691). February, 1989.

National Historic Preservation Act of 1966 as amended and the Archeological Resources Protection Acto of 1979.

Public Law 101-601, Native American Graves Protection and Repatriation Act.

MISCELLANEOUS PUBLICATIONS

Alan M. Voorhees and Associates, Inc. 1978. Transportation study, Carlsbad Caverns National Park. Final rept. prepared for the U. S. Dept. Int., NPS. 245 pp.

Attorney General of the State of New Mexico. 1934. Attorney General's Opinion No. 785. July 12.

Ballew, Maurice and B. Wyatt. 1977. Information storage and retrieval. Pp. 118-125 in Third annual report - biological investigations and information storage and retrieval system, Guadalupe Mountains National Park, Texas. Texas Tech Univ., Lubbock.

Campbell, G. D. and E. N. Smith. 1975. Simple arthropod activity monitor. Pan-Pacific Entomologist 51:328-329.

Chapman, John. 1974. The top of Texas. Texas Parks and Wildl. 32:2-11.

Clegg, Kim. 1976. Measured trail distances, Guadalupe Mountains National Park. Unpubl. rept. 6 pp.

Duran, Benjamin S. 1974a. On an informational system for monitoring a national park. Pp. 16-19 in Transactions of Southwest Region Nat. Sci. Conf., NPS, Santa Fe, New Mexico.

_____. 1974b. Annual report on data analysis, Guadalupe Mountains National Park, Texas. Pp. 1-12 in 1974 annual report on Guadalupe Mountains studies.

_____. 1975. On an informational system for monitoring a national park. Pp. 21-50 in Studies in vascular plants, mammal survey and data analysis, Guadalupe Mountains National Park.

Fish, Ernest B., Roger B. Lewis, and Gene L. Brothers. 1981a. Erosional impact of trails in Guadalupe Mountains National Park, Texas. Unpubl. draft. 16 pp.

_____. 1981b. Erosional impact of trails in Guadalupe Mountains National Park, Texas. In Landscape Planning 8:387-398. Elsevier Sci. Publ. Co., Amsterdam.

Gehlbach, Frederick R. 1979. Biomes of the Guadalupe escarpment: vegetation lizards, and human impact. Pp. 427-439 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Gibbons, Stephen T. 1980a. Air quality related values inventory - Carlsbad Caverns National Park. Rept. to NPS, Southwest Region, Santa Fe, New Mexico. 30 pp. 30 May.

_____. 1980b. Air quality related values inventory - Guadalupe Mountains National Park. Rept. to NPS, Southwest Region, Santa Fe, New Mexico. 26 pp. 3 July.

Gosdin, John M. 1969. A basis for facility development at Guadalupe Mountains National Park. M.S. thesis. Texas Tech Univ., Lubbock.

Kurtz, Don and William D. Goran. 1978. Trails of the Guadalupes, a hikers guide to the trails of Guadalupe Mountains National Park. Environmental Assoc., Champaign, Illinois. 60 pp.

Lane, Kenneth F. 1965. Master plan brief. Unpubl. rept. 33 pp.

Marlett, Robert and James Mertes. 1979. Visitor use survey, Guadalupe Mountains National Park, Texas. Unpubl. rept. for NPS, Southwest Regional Office, Santa Fe, New Mexico. 68 pp.

National Speleological Society. 1970. A wilderness proposal for the Guadalupe escarpment, New Mexico and Texas.

Neptune, Gary. 1972. El Capitan: Texas. Climbing 3:16-20.

Obert, D. D. 1938. Narrative report on McKittrick Canyon, Culberson County, Texas. Unpubl. rept. Austin, Texas.

Peters, Robert W. 1976. Electronic interpretive system at Carlsbad Caverns National Park. P. 69 in Natl. Cave Mgmt. Symposium Proc., Albuquerque, New Mexico. 1975.

Rummel, Bartlett. 1970. A court case of consequence. P. 55 in Am. Rifleman. September.

Sosebee, Ronald E. and Henry A. Wright (eds.). 1978. Research highlights - 1978 noxious brush and weed control, range and wildlife management. Texas Tech Univ., Lubbock. 69 pp.

U. S. Department of the Interior, National Park Service. 1963. Area investigation report on a proposed Guadalupe Mountains National Park, Texas.

_____. 1969. Basic data for Carlsbad Caverns National Park and Guadalupe Mountains National Park.

_____. 1975. Annual report for calendar year 1974.

Vesely, Frank. 1933. Who owns Carlsbad Caverns? Pp. 17-19, 48-49 in New Mexico Mag., December.

Wilkey, John S. 1979. Effects of aspect and elevation on soil properties in Guadalupe Mountains National Park, Texas. M.S. thesis. Texas Tech Univ., Lubbock. 92 pp.

Wilkens, Eugene M. 1973. Analysis of wind data for planning and design of a tramway in Guadalupe Mountains National Park. Unpubl. rept. (typewritten) to NPS, Southwest Region, Santa Fe, New Mexico. 25 pp.

_____. 1975. Meteorological study - Guadalupe Mountains National Park. Unpubl. rept. by Ecology Audits, Inc. to NPS, DSC, Denver, Colorado. 120 pp.

PALEONTOLOGY

Applegarth, John S. 1979. Environmental implications of herpetofaunal remains from archeological sites west of Carlsbad, New Mexico. Pp. 159-167 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Babcock, Laurel C. 1974a. Conodont paleoecology of a Guadalupian (Permian) shelf to basin sequence, Permian reef complex, west Texas and New Mexico (abs.). P. 489 in Abstracts with programs: North-central sect., Geol. Soc. Am.

_____. 1974b. Statistical approaches to the conodont paleoecology of the Lamar limestone, Permian reef complex, west Texas. Ph.D. dissertation, Univ. Wisconsin, Madison. 175 pp.

Baker, James K. 1963. Fossilization of bat skeletons in the Carlsbad Caverns. NSS Bull. 25:37-44.

Behnken, Fred Henry. 1972. Leonardian and Guadalupian (Permian) conodont biostratigraphy and evolution in western and southwestern United States. Ph.D. dissertation, Univ. Wisconsin, Madison. 184 pp.

Black, Donald M. 1953. Fossil deposits under the entrance of Carlsbad Caverns. Sci. 118:308-309.

Bryant, Vaughn B., Jr. 1977. Late quaternary pollen records from the east-central periphery of the Chihuahuan Desert. Pp. 3-21 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

Croft, John S. 1972. A description and paleoecologic study of conodonts from the Pinery limestone member of the Bell Canyon Formation (Upper Permian), Guadalupe Mountains, West Texas. M.S. thesis, Ohio State Univ., Columbus. 54 pp.

_____. 1978. Upper Permian conodonts and other microfossils from the Pinery and Lamar limestone members of the Bell Canyon Formation and from the Rustler Formation, West Texas. M.S. thesis, Ohio State Univ., Columbus. 176 pp.

Cronoble, J. M. 1974. Biotic constituents and origin of facies in Capitan reef, New Mexico and Texas. Mountain Geol. 11:95-108.

Davidson, Billy Max. 1970. Late Pleistocene and recent mammal fauna of the southern Guadalupe Mountains. For the Texas Archeol. Soc. 55 pp.

Gehlbach, Frederick R. and J. Alan Holman. 1974. Paleoecology of amphibians and reptiles from Pratt Cave, Guadalupe Mountains National Park, Texas. The Southwestern Nat. 19:191-198.

Girty, George H. 1908. The Guadalupian fauna. USGS Prof. Paper 58. GPO, Washington. 651 pp.

Harris, Arthur H. 1970. The Dry Cave mammalian fauna and late pluvial conditions in southeastern New Mexico. Texas J. Sci. 22:3-27.

_____. 1977. Wisconsin Age environments in the northern Chihuahuan Desert: evidence from the higher vertebrates. Pp. 23-52 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

Hollingsworth, R. B. and H. L. Williams. 1955. Evolution of the Fusulinidae. Paleontological Lab., Midland, Texas. 19 pp.

Howard, Hildegarde. 1971. Quaternary avian remains from Dark Canyon Cave, New Mexico. Condor 73:237-240.

Klement, Karl W. 1966. Studies on the ecological distribution of lime-secreting and sediment-trapping algae in reefs and associated environments. M. Jo. Geol. Paleont. Abh. 125:363-381.

Lawrence, Barbara. 1960. Fossil Tadarida from New Mexico. J. Mammal. 41:320-322.

Logan, Lloyd E. 1975. The quaternary vertebrate fauna of Upper Sloth Cave, Guadalupe Mountains National Park, Texas (abs.). Southcentral Sec. G.S.A., p. 210.

_____. 1977a. Third annual report on natural science projects, Guadalupe Mountains National Park, Texas. Pp. 111-117 in Third annual report - Biological investigations and information storage and retrieval system, Guadalupe Mountains National Park, Texas. Texas Tech Univ., Lubbock.

_____. 1977b. The paleoclimate implications of the avian and mammalian faunas of Lower Sloth Cave, Guadalupe Mountains, Texas. M.S. thesis, Texas Tech Univ., Lubbock. 72 pp.

_____. 1978. A preliminary report on the mammalian fossils from Msukox Cave and their paleoclimatic implications. Dept. Paleobiology, Smithsonian Inst., Washington. Unpubl. rept. to NPS. 31 pp.

_____. 1979. The mammalian fossils from Msukox Cave and their paleoclimatic implications. Dept. Paleobiology, Smithsonian Inst., Washington. Unpubl. rept. to NPS. 67 pp.

Logan, Lloyd E. and Craig C. Black. 1979. The quaternary vertebrate fauna of Upper Sloth Cave, Guadalupe Mountains National Park, Texas. Pp. 141-158 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Lundelius, Ernest L., Jr. 1970. Mammalian remains from Pratt Cave, Culberson County, Texas. Unpubl. Ms. Dept. Geol. Sci., Univ. Texas, Austin. 42 pp.

_____. 1979. Post-Pleistocene mammals from Pratt Cave and their environmental significance. Pp. 239-258 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Miller, A. K. and W. M. Furnish. 1940. Permian ammonoids of the Guadalupe Mountains region and adjacent areas. Geol. Soc. Am. Spec. Paper No. 26. Waverly Press, Inc., Baltimore.

Murray, Keith F. 1957. The Pleistocene climate and the fauna of Burnet Cave, New Mexico. Ecology 38:1:129-132.

Riskind, David H. 1970. Preliminary report on Texas Archeological Society's 1970 palynological studies at Guadalupe Mountains National Park. 5 pp.

Ruedemann, R. 1929. Coralline algae, Guadalupe Mountains. Am. Assoc. Petrol. Geol. Bull. 13:1079-1080.

Schultz, C. B. and E. B. Howard. 1935. The fauna of Burnet Cave, Guadalupe Mountains, New Mexico. Proc. Acad. Nat. Sci. 87:273-298.

Shumard, B. F. 1958. Notice of new fossils from the Permian strata of New Mexico and Texas, collected by Dr. George G. Shumard, geologist for the United States government expedition for obtaining water by means of artesian wells along the 32nd parallel, under the direction of Capt. John Pope. U. S. Top. Eng., St. Louis Acad. Sci. Trans. 1:290-297.

Skinner, J. W. and G. L. Wilde. 1954. The fusulinid subfamily Boultoniinae. J. Paleontol. 28:434-444.

_____. 1955. New fusulinids from the Permian strata of west Texas. J. Paleontol. 29:927-940.

Spaulding, W. Geoffrey and Paul S. Martin. 1979. Ground sloth dung of the Guadalupe Mountains. Pp. 259-269 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Stearns, C. E. 1942. A fossil marmot from New Mexico and its climatic significance. Am. J. Sci. 240:867-878.

Strain, William S. 1966. Blancan mammalian fauna and Pleistocene formation, Hudspeth County, Texas. Bull. Texas Mem. Mus. No. 10. 55 pp.

Strum, John J. 1975. Conodont biostratigraphy and paleoecology of the Hegler and Pinery members, Bell Canyon Formation (Permian) in the Delaware Basin of West Texas. M.S. thesis, Texas Tech Univ., Lubbock. 68 pp.

Van Devender, Thomas R., Paul S. Martin, Arthur M. Phillips III, and W. Geoffrey Spaulding. 1977. Late Pleistocene biotic communities from the Guadalupe Mountains, Culberson County, Texas. Pp. 107-113 in Transactions of the symposium on the biological resources of the Chihuahuan Desert region, United States and Mexico (Roland H. Wauer and David H. Riskind, eds.). NPS Trans. and Proc. Series No. 3.

Van Devender, Thomas R., W. Geoffrey Spaulding, and Arthur M. Phillips, III. 1979. Late Pleistocene plant communities in the Guadalupe Mountains, Culberson County, Texas. Pp. 13-30 in Biological investigations in the Guadalupe Mountains National Park, Texas (H. H. Genoways and R. J. Baker, eds.). NPS Trans. and Proc. Series No. 4.

Warnick, Barton H. No date. Plant analysis of the Pratt Cave, McKittrick Canyon of GMNP. Unpubl. report. Sul Ross State Univ., Alpine, Texas. 29 pp.

Wendorf, F. (assembler). 1961. Paleoecology of the Llano Estacado. Mus. New Mexico Press, Santa Fe. 144 pp.

PLANNING DOCUMENTS

National Park Service. 1965. Master plan brief for Guadalupe Mountains National Park.

_____. 1972a. Wilderness recommendations, Carlsbad Caverns National Park, New Mexico. 37 pp.

_____. 1972b. Wilderness recommendations, Guadalupe Mountains National Park, Texas. 40 pp.

_____. No date. Tramway study, Pine Springs Canyon, Guadalupe Mountains National Park, Texas. 11 pp.

_____. 1973a. Backcountry management plan, Carlsbad Caverns National Park, New Mexico. 4 pp.

_____. 1973b. Backcountry management plan, Guadalupe Mountains National Park, Texas. 12 pp.

_____. 1973c. Final environmental statement, Wilderness Recommendations, Carlsbad Caverns National Park, New Mexico. 55 pp.

_____. 1973d. Final environmental statement, Wilderness Recommendations, Guadalupe Mountains National Park, Texas. 89 pp.

_____. 1974a. Environmental assessment, development concept plan, Slaughter Canyon, Carlsbad Caverns National Park, New Mexico. 143 pp.

_____. 1974b. Final environmental statement, proposed master plan, Carlsbad Caverns National Park, New Mexico. 170 pp.

_____. 1975a. Development concept plan, Slaughter Canyon, Carlsbad Caverns National Park, New Mexico. 15 pp.

_____. 1975b. Environmental assessment, development concept plan, Pine Springs, Guadalupe Mountains National Park, Texas. 185 pp.

_____. 1975c. Master plan, Carlsbad Caverns National Park, New Mexico. 49 pp.

_____. 1976a. Environmental assessment, building/ utilities, McKittrick Canyon. 42 pp.

_____. 1976b. Final development concept plan, Pine Springs, Guadalupe Mountains National Park, Texas. 23 pp.

_____. 1976c. Final environmental statement, proposed master plan, Guadalupe Mountains National Park, Texas. 327 pp.

_____. 1976d. Master plan, Guadalupe Mountains National Park, Texas. 75 pp.

_____. 1976e. Statement for management, Carlsbad Caverns National Park, New Mexico. 40 pp.

_____. 1976f. Statement for management, Guadalupe Mountains National Park, Texas. 30 pp.

_____. 1978. Environmental assessment, development concept plan, Upper Dog Canyon, Guadalupe Mountains National Park, Texas. 45 pp.

_____. 1979a. Interim fire management plan, Carlsbad Caverns National Park. 48 pp.

_____. 1979b. Interim fire management plan, Guadalupe Mountains National Park. 48 pp.

_____. 1979c. Statement for management (revised), Carlsbad Caverns National Park, New Mexico.

_____. 1979d. Statement for management (revised), Guadalupe Mountains National Park, Texas.

_____. 1981. Cave Management Plan and Environmental Assessment, Carlsbad Caverns and Guadalupe Mountains National Parks. 35 pp.

_____. 1985. Fire Management Plan, Guadalupe Mountains National Park. 69 pp.

----------. 1985. Backcountry Management Plan, Guadalupe Mountains National Park. 59 pp.

----------. 1987. Resource Management Plan, Guadalupe Mountains National Park. 137 pp.

----------. 1987. West Side Boundary Survey, Guadalupe Mountains National Park. 19 pp.

_____. 1988. Statement for Management, Guadalupe Mountains National Park, Texas. 46 pp.

----------. 1991. Cave Management Plan, Guadalupe Mountains National Park. 26 pp.